

Perspectives on water and climate change adaptation

Climate change adaptation in the water sector – Financial issues



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This Perspective Document is part of a series of 16 papers on «Water and Climate Change Adaptation»

‘Climate change and adaptation’ is a central topic on the 5th World Water Forum. It is the lead theme for the political and thematic processes, the topic of a High Level Panel session, and a focus in several documents and sessions of the regional processes.

To provide background and depth to the political process, thematic sessions and the regions, and to ensure that viewpoints of a variety of stakeholders are shared, dozens of experts were invited on a voluntary basis to provide their perspective on critical issues relating to climate change and water in the form of a Perspective Document.

Led by a consortium comprising the Co-operative Programme on Water and Climate (CPWC), the International Water Association (IWA), IUCN and the World Water Council, the initiative resulted in this series comprising 16 perspectives on water, climate change and adaptation.

Participants were invited to contribute perspectives from three categories:

- 1 **Hot spots** – These papers are mainly concerned with specific locations where climate change effects are felt or will be felt within the next years and where urgent action is needed within the water sector. The hotspots selected are: Mountains (number 1), Small islands (3), Arid regions (9) and ‘Deltas and coastal cities’ (13).
- 2 **Sub-sectoral perspectives** – Specific papers were prepared from a water-user perspective taking into account the impacts on the sub-sector and describing how the sub-sector can deal with the issues. The sectors selected are: Environment (2), Food (5), ‘Water supply and sanitation: the urban poor’ (7), Business (8), Water industry (10), Energy (12) and ‘Water supply and sanitation’ (14).
- 3 **Enabling mechanisms** – These documents provide an overview of enabling mechanisms that make adaptation possible. The mechanisms selected are: Planning (4), Governance (6), Finance (11), Engineering (15) and ‘Integrated Water Resources Management (IWRM) and Strategic Environmental Assessment (SEA)’ (16).

The consortium has performed an interim analysis of all Perspective Documents and has synthesized the initial results in a working paper – presenting an introduction to and summaries of the Perspective Documents and key messages resembling each of the 16 perspectives – which will be presented and discussed during the 5th World Water Forum in Istanbul. The discussions in Istanbul are expected to provide feedback and come up with suggestions for further development of the working paper as well as the Perspective Documents. It is expected that after the Forum all documents will be revised and peer-reviewed before being published.

**Climate change adaptation in the
water sector – Financial issues****Marloes Bakker**

Co-operative Programme on Water and Climate (CPWC), P.O. Box P.O. Box 82327, 2508 EH Den Haag, The Netherlands, Tel: +31 (0)70 304 37 53, Fax: +31 (0)70 304 37 96, m.bakker@cpwc.nl.

Henk van Schaik

Co-operative Programme on Water and Climate (CPWC), P.O. Box P.O. Box 82327, 2508 EH Den Haag, The Netherlands, Tel: +31 (0)70 304 37 52, Fax: +31 (0)70 304 37 96, h.vanschaik@cpwc.nl.

Climate change adaptation in the water sector – Financial issues

The present document discusses the economic and financial issues of adaptation to climate change. The (inter)national adaptation funding instruments presently available were inventoried and analysed. The analysis clearly showed that projected needs cannot be met with these instruments alone, while an overarching harmonized strategic financial framework, without which the benefits for the global environmental environment will remain suboptimal, is still lacking. The document therefore describes what other options for financing could be developed.

Introduction

Studies by the World Bank, the Stern Review, the Human Development Report research team, the UNFCCC and Oxfam estimate global adaptation costs to be in the order of tens of billions of dollars per year (see Table 1), while the adaptation costs in the water sector specifically are estimated to be around US\$ 531 billion from now to 2030 (Kirshen, 2007). The actual global costs could exceed US\$ 100 billion per year and will be sensitive to many factors, including how much and when mitigation will take place. The limited quantitative information on the costs and benefits of economy-wide adaptation makes estimating global costs, to say the least, challenging¹. Though exact figures are not yet available, it is clear that a large amount of new and additional investment and financial flows will be needed to address climate change adaptation.

1 Global funds for adaptation

This section will give an overview of the current global adaptation funding instruments:

¹ Adaptation actions will be myriad, widespread and heterogeneous, while adaptation needs depend on the magnitude and nature of climate change. In addition, the range of estimates is the result of the uncertainty of expected impacts, the different understandings of what adaptation entails and the use of different models. Furthermore, there are few estimates of adaptation costs. More analysis of the costs of adaptation at the different levels is required to support the development of an effective and appropriate international response.

- 1 UNFCCC Funds
 - a GEF Trust Fund
 - b Least Developed Countries Fund
 - c Special Climate Change Fund
- 2 Adaptation Fund
- 3 Other UN Conventions
 - a Convention on Biological Diversity
 - b Convention on Wetlands
 - c Convention to Combat Desertification
- 4 World Bank Adaptation Funds
 - a Clean Technology Fund
 - b Strategic Climate Fund (SCF) with a Pilot Program for Climate Resilience (PPCR)
- 5 New Bilateral Funds

1.1 UNFCCC Funds

The Global Environment Facility (GEF)² is currently the entity entrusted with the operation of the financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC)³, and as such provides the instruments for the transfer of financial resources from developed to developing countries. The instruments for adaptation funding via the GEF are:

- 1 The GEF Trust Fund;

² See <http://www.gefweb.org>. The GEF is funded by donor countries, some of which are also recipients, who commit resources every four years through a replenishment process.

³ The United Nations Framework Convention on Climate Change (UNFCCC) commits developed countries to assist developing countries in meeting costs of adaptation to the adverse effects of climate change.

Table 1: Estimates of global annual adaptation costs.

	Covered area	Annual costs
World Bank	Adaptation investments in developing nations	USD 3-37 billion
Stern Review	Adaptation investments in OECD countries	USD 15-150 billion; 0.05-0.5% of GDP
Oxfam International	Adaptation investments in developing nations	USD 50 billion
Human Development Report 2007	New and additional financing for pro-poor adaptation	USD 86 billion
Kirshen 2007	Adaptation in the water sector	USD 23 billion
UNFCCC	Additional adaptation investments needed by 2030	[USD 11 billion for new water infrastructure; 85% of which is needed in non-Annex I countries]

- 2 The Least Developed Countries Fund (LDCF);
- 3 The Strategic Priority on Adaptation (SPA), and
- 4 The Special Climate Change Fund (SCCF).

Together, these funds amount to over US\$ 275 million. The SPA operates as part of the GEF Trust Fund, which in practice translates into very complex procedures for project proposals (Le Goulven, 2008). The LDCF and SCCF are independent from the GEF Trust Fund and therefore do not have to produce global environmental benefits. Since 2005, GEF has provided US\$ 110 million for projects targeted mainly at studies, as well as demonstration and pilot projects on adaptation planning and assessment.

During the GEF Replenishment of 2006, 32 donor countries pledged US\$ 1 billion to support activities in the area of climate change between 2007 and 2010. Currently, the GEF is in the process of reviewing, revising and focusing its climate change strategy.

The World Bank noted that the total amount of funding for adaptation projected to be available by 2012 falls well short of the estimated amounts needed. In addition, developing countries have expressed the additional concern that the complexity of current arrangements constrains their access to funds for adaptation project activities.

1.2 Adaptation Fund of the United Nations Framework Convention on Climate Change

The UNFCCC conference in Bali (December 2007) culminated in the adoption of the so-called 'Bali Road Map', which designates the timeframe and material content of negotiations for the next two years. The Bali Road Map also includes the approval and launch of the basic principles of the functioning of the Adaptation Fund⁴.

The Adaptation Fund should serve for the financing of adaptation measures (in the form of projects and programmes) in developing countries. The main task of the Adaptation Fund will be to ameliorate the impacts on, in particular, water management, agriculture and forestry in those parts of the world that are most vulnerable to the impacts of climate change.

It was decided that the Adaptation Fund should be incorporated under the management of the GEF, and the payment unit will be the World Bank. It was furthermore determined that the Adaptation Fund is to be supervised and managed by an Adaptation Fund Board represented by developed and developing countries. Although the secretariat for the fund will be held by the World Bank-based trust fund, the GEF, this is meant to be a temporary status. The secretariat would have to report to the Adaptation Fund Board and the GEF's status as secretariat will be reviewed after three years. The managing principles of the

⁴ <http://www.adaptation-fund.org>

Adaptation Fund have been provided, but priorities, eligibility criteria and disbursement criteria have not been decided upon yet.

The Adaptation Fund will receive a 2% share of proceeds from the Clean Development Mechanism (CDM) and is to finance concrete adaptation projects and programmes in developing countries that are Parties to the Protocol. Hence, the level of funding for the Adaptation Fund under the Kyoto Protocol depends on the quantity of certified emission reductions issued and their price. Consequently, a lot of uncertainty remains about the level of actual resources that will be mobilized under the agreement. Carbon trading was expected to become a US\$ 70 billion a year industry by the time the Adaptation Fund went into effect in 2008. There are substantial uncertainties about how much funding the market will generate, because it will depend on both the size of the market and on prices. The variation is partly due to uncertainties in the future of carbon markets and size of future emissions caps, which are currently being negotiated in the Bali Road Map process up to December 2009. Estimates vary widely, from a few hundred million dollars to nearly a billion dollars by 2012, which would make expected funding for the Adaptation Fund comparable to the funding anticipated by the World Bank's Pilot Program on Climate Resilience or PPCR (see 1.4).

Note that none of the UN funds (or the Adaptation Fund) are structured in a programmatic way. This might result in donor countries channelling funds through the Strategic Climate Fund of the World Bank, which would allow for programmatic options.

Hence, a successor to the Kyoto protocol will be crucial to prevent further dangerous climate change. Bali got the process started with the Adaptation Fund, and during COP-14 in Poznan (1–12 December, 2008), a last minute decision and promising step forward was made to allow developing countries direct access to an adaptation fund to help cope with the effects of global warming. In addition, Parties agreed that the Fund would be a legal entity that will be operative as from January 2009 and will be able to receive projects in the course of next year. The initial allocation of US\$ 80 million⁵ committed by the rich

countries invoked disappointed sounds from the developing nations and environmental organizations⁶. The issue is now delayed until COP-15 (Copenhagen, 2009), where it will be vital to reach a comprehensive agreement that will result in a more substantial, predictable, obligatory and reliable financial flow.

1.3 Other UN Conventions

Other UN Conventions: Convention on Biological Diversity

The UN Convention on Biological Diversity⁷ (UNCBD) was adopted in 1992. The main objectives of this Convention are the conservation of biological diversity, the sustainable use of its components and the equitable sharing of the benefits from the use of biodiversity resources.

Adaptation activities can threaten biodiversity either directly – through the destruction of habitats, e.g. building sea walls, thus affecting coastal ecosystems, or indirectly – through the introduction of new species or changing management practices. Ranging from the construction of protective infrastructure to the development of corridors or the planting of resistant tree or crop varieties, adaptation activities can either have a positive, negative or neutral impact on biodiversity. Hence, numerous activities under the UNCBD agenda can potentially constitute adaptation measures or can assist adaptation.

In 2005, a practical guidance on the risk assessment and management approach to evaluating links between adaptation and biodiversity was developed under the framework of the UNCBD⁸.

oping countries, considering many Parties called for an increase. Parties were unable though to reach consensus on scaling up the fund by a levy on the other two Kyoto mechanisms, the JI and the countries' Assigned Amount Units (AAU's). The reason why no consensus was reached was that countries that host JI projects thought a levy might make them more expensive.

⁶ Many world leaders admitted that they are waiting for Barack Obama, and all agree that no deal is worth having without the US signing up.

⁷ <http://www.cbd.int>.

⁸ <http://www.cbd.int/doc/bioday/2007/ibd-2007-booklet-or-en.pdf>

⁵ The fund could be worth USD 300 million a year by 2012. This current amount however could also be seen as a failure that caused some 'bitterness' among devel-

Various mechanisms can be deployed to finance biodiversity. Money can be raised directly from biodiversity, such as through the sustainable use or trade of biological resources themselves including goods such as timber and non-timber forest products and the pharmaceutical, agricultural and industrial applications of biological resources, as well as services such as water provision, climatic regulation, tourism and scientific research. Finance can also be raised by making sure that charges are levied on economic activities which contribute to biodiversity degradation and loss such as pollution taxes, land reclamation bonds and waste disposal charges. Other financing mechanisms include the transfer or redistribution of funds between individuals, groups or countries as through measures such as investment promotion, trust funds, loans, swaps and offsets.

Convention on Wetlands

The Convention on Wetlands, or the Ramsar Convention⁹, was adopted in 1971 and entered into force in 1975. As of July 2008, it has 158 Parties. The Convention provides a framework for international cooperation for the conservation and wise use of wetlands. The Convention is concerned not just with isolated sites, but the management of the entire catchment of river basins.

Wetland responses to climate change are still poorly understood and are often not included in global models of the effects of climate change (Clair et al., 1997). However, wetlands are critically important ecosystems that provide globally significant social, economic and environmental benefits. Furthermore, efforts to respond to climate change may have equally negative, and compounding, effects on freshwater and coastal zone ecosystems. Hence, the vulnerability of specific types of wetlands plays a decisive role in the degree to which the development of adaptation strategies is needed. Preventing additional stress on wetlands from pollution, for example, is an important adaptation strategy for climate change.

To assist Parties in implementing the Ramsar Convention, three targeted funding mechanisms

have been established¹⁰: (1) a Small Grants Fund for Wetland Conservation and Wise Use (a global programme); (2) Wetlands for the Future (a programme for Latin America and the Caribbean); and (3) the Swiss Grant Fund for Africa. In addition, private sources, bilateral donors and NGOs frequently provide financial resources to protect and manage wetlands.

Convention on Desertification

The Convention to Combat Desertification¹¹ (UNCCD) was adopted in 1994 and currently has 191 Parties. The aim of the Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa.

Climate variability together with human activities, such as over-exploitation and inappropriate land use are recognized as main causes of land degradation and desertification. The UNCCD calls for cooperation with other conventions, "... particularly the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity, in order to derive maximum benefit from activities under each agreement while avoiding duplication of effort". Similar to the UNCBD, the UNCCD has tight links with the adaptation component of the UNFCCC. For instance, many actions in drought-prone countries to address problems of land degradation could also be included in the list of adaptation actions.

The Convention established a Global Mechanism (GM) to promote actions leading to the mobilization and channelling of substantial financial resources to affected developing country Parties. The GM acts as a hub for a dynamic network of partners, committed to focusing their energies, resources and knowledge on combating desertification. The GM not only mobilizes financial resources, but also channels their flow, thereby guaranteeing increased financial effectiveness and efficiency and ensuring a holistic and equitable approach to resource distribution. The International Fund for Agricultural Development

⁹ <http://www.ramsar.org>.

¹⁰ For more information, see <http://www.unep.org/dec/onlineManual/Compliance/NationalImplementation/CapacityBuilding/Resource/tabid/685/Default.aspx>.

¹¹ <http://www.unccd.int>.

(IFAD) was selected to house the GM. In 2003, the GEF was selected as a financial mechanism of the UNCCD.

1.4 World Bank Adaptation Funds

The World Bank has approved the creation of two specific Climate Investment Funds (CIFs)¹², targeted to reach US\$ 5 billion:

- 1 The Clean Technology Fund (CTF);
- 2 The Strategic Climate Fund (SCF), under which a Pilot Program for Climate Resilience (PPCR) has been set up.

The objective of the CTF is to accelerate the transformation to low carbon economies by financing a more rapid deployment of low carbon technologies and sector strategies. It has been developed to demonstrate new approaches and provide lessons to contribute to the negotiations under the Bali Action Plan. The amount of funding is still highly uncertain.

The SCF is aimed at increasing climate resilience in developing countries, and is “to be disbursed as grants, highly concessional loans, and/or risk mitigation instruments”. The objective of the SCF is relatively broad and will address a host of issues, including climate resilience or adaptive capacity¹³.

The Pilot Program for Climate Resilience (PPCR) under the SCF is designed to assure a strong link with the Adaptation Fund and to deliver programmatic funding in 5 to 10 countries to help transform national development planning to make it more cli-

mate resilient, by exploring ways to integrate adaptation into development planning and budgeting, building on the National Adaptation Programmes of Action (NAPAs). The Pilot Program is meant to be a pilot only, and not continue beyond 2012. It will build upon National Adaptation Programmes of Action (NAPAs) and is targeted to consist of US\$ 0.5 to 1 billion in grants and concessional loans.

Both donor countries and developing countries have been critical of the PPCR with regard to its relationship to and overlap with the Adaptation Fund. The World Bank has denied any intention of competing with the Adaptation Fund and has promised to work with the UNFCCC Secretariat to ensure that they are not competitive in any way. It has been announced that the chairman of the Adaptation Fund will be on the oversight committee that governs the PPCR. The World Bank and the GEF have furthermore agreed to a set of operational principles by which each party recognizes that the other has important but different roles to play in funding adaptation.

NGOs have expressed concerns over the Climate Investment Funds (CIFs) of the World Bank, including criticism that the initiative could undermine existing multilateral negotiations on climate change and create conflicting parallel mechanisms for delivering climate-related financing. Representatives of NGOs are also concerned that the current rush to finalize the proposals for the funds could lead to the establishment of “top-down funds, without adequate participation of developing countries, without much needed accountability mechanisms, and without promoting the wider environmental and development benefits and sustainable transformations”. Furthermore, parts of the climate investment funds will be counted as official development assistance (ODA, see Box 1) by donor countries which means that there will be no additionality in overall development financing to developing countries¹⁴.

¹² <http://www.worldbank.org/cif>.

¹³ Within the framework of the SCF, a forest investment fund/programme should be established by the end of 2008 to mobilize significantly increased funds to reduce deforestation and forest degradation and to promote improved sustainable forest management, leading to emission reductions and the protection of carbon reservoirs. The design process is to take into account country-led priority strategies for the containment of deforestation and degradation and build upon complementarities between existing forest initiatives. Work would also advance on a programme to support investments in low-income countries for energy efficiency, renewable energy and access to modern sustainable energy.

¹⁴ This goes against existing multilateral commitments under the UNFCCC which state that developed countries should provide new and additional financial resources to meet the agreed full costs incurred by developing countries in meeting their climate change commitments.

Box 1 – Official development assistance and adaptation to climate change

In view of the fact that the current global funds for adaptation are not only technically but also financially inadequate, the question arises as to whether or not alternative arrangements for adaptation funding, such as bilateral and multilateral Official Development Assistance (ODA), could address the concerns of developing countries and better meet their needs. However, should adaptation be funded out of the ODA Funds, money that is meant to address other developmental challenges could divert money and thereby threaten the pursuance of the MDGs and targets laid down for water sanitation and IWRM plans. It has been argued that additional finance for adaptation is not aid, but a form of compensatory finance – the motivation for providing adaptation assistance is not compassion, it is an acknowledgement of a responsibility to pay and must therefore not come out of long-standing donor commitments to provide 0.7 per cent of gross domestic product as aid in order to eradicate poverty.

A concerted research effort is therefore needed to answer questions concerning the efficiency and effectiveness of mainstreaming, barriers to and opportunities for mainstreaming, the accountability of industrialized countries with respect to their commitments under the United Nations Framework Convention on Climate Change (Klein, 2006) and, ultimately, how to climate-proof ODA by integrating risk reduction and adaptation to climate change into the development and poverty reduction plans of poor countries. Financially and technically adequate global funds for adaptation are crucial if international climate policy after 2012 is to be a truly global endeavour, whereby global funds serve as a catalyst for providing additional resources from bilateral and multilateral sources.

Wider issues in this context are:

- The difficulties of disaggregating the costs for adaptation activities from normal development activities may make the aid diversion issue prominent in the adaptation funding area.
- The greater ease of classifying finance for specific adaptation projects as additional, compared with finance for climate-proofing development interventions, may contribute to further divisions between these two approaches and result in a tendency toward more project-based approaches.
- The shift in fund management from ministries of development to ministries of environment (e.g. as in Norway and Germany) may make distinctions easier, but this depends on how the funds are classified. For example, in Norway funds are still classified as ODA even though they are under the Ministry of Environment.
- The innovative financial mechanisms relating to climate investments (such as air travel adaptation levies and carbon trading auctions and levies) that are being considered by some donors may help to raise additional funds that are more clearly separated from ODA.

Sources: World Bank, 2006; Bouwer and Aerts, 2006; Oxfam International, 2007; Le Goulven, 2008.

1.5 New bilateral funds

The bilateral funds¹⁵ discussed in this section all aim to address the international funding gap for climate

change, but are not yet functional, so their final structure and operational practices cannot be stated with complete certainty (Porter et al., 2008).

Four European countries, together with the European Union, Australia and Japan have made recent commitments to provide new financing to assist international measures to tackle climate change. Most funds are aimed at supporting developing countries and hence have a close relationship with development assistance. The following initiatives

¹⁵ Not included here, because it is a multilateral initiative: the Bangladesh Multi-Donor Trust Fund (Howard, 2008). This MDTF is in the very early stages of design - but the general idea is to finance the projects to be developed along the priority areas outlined in the Climate Change Strategy and Action Plan of the Government of Bangladesh. The UK Department for International Development (DFID) will contribute £60 million

into this fund and Denmark and Australia have expressed interest to contribute as well.

have been proposed (Porter et al. 2008; Howard, 2008):

- 1 The Global Climate Change Alliance (GCCA) - European Commission;
- 2 The International Window of the Environmental Transformation Fund (ETF-IW) - United Kingdom;
- 3 The Millennium Development Goals (MDG) Fund - Spain;
- 4 The Cool Earth Partnership - Japan;
- 5 The International Climate Protection Initiative - Germany;
- 6 The Agency for Development Cooperation (NORAD) Rainforest Initiative - Norway.

All of the initiatives aim to address climate change adaptation and mitigation by providing direct or indirect financial support for such activities, but only a few have wider ambitions to facilitate the coordination and negotiation between donors and potential recipient countries in the lead up to a new post-2012 climate agreement. All the funds have a limited time horizon, with no commitments made beyond the 2012 date for negotiations on a post-Kyoto agreement. This short timescale is indicative more of a piloting phase rather than any new long-term architecture of global environmental funding. The experience gained through disbursing these funds, however, will provide much valuable experience on how to channel global funds to tackle climate change in developing countries over the long term.

The total nominal amount of dedicated finance is somewhat less than US\$ 3 billion per year, which represent a small percentage of the expected needs of developing countries.

A brief description of each of the proposed initiatives is given below. More information can be found in Porter et al (2008).

GCCA – European Commission

The European Commission's Global Climate Change Alliance (GCCA) will address mitigation, adaptation and poverty reduction via a proposed partnership with developing countries that will include the provision of both technical and financial assistance. Technical and financial support will be provided for adaptation. In addition, it aims to provide an informal forum that will facilitate negotiations for a post-

2012 climate agreement. The GCCA also plans to add value by acting as a clearinghouse mechanism to coordinate the international adaptation initiatives of EU member states. The fund is envisioned to generate US\$ 50 million (Le Goulven, 2008).

ETF-IW – UK

The UK's International Window of the Environmental Transformation Fund (ETF-IW) has two kinds of objectives. The first process objectives relate to transforming how finances are delivered. These include facilitating moves toward additional finance provided in a programmatic way; avoiding aid proliferation and ensuring coherence, and piloting models that will feed into the UNFCCC negotiation process and the Kyoto Adaptation Fund. The second set are thematic objectives that include supporting poverty reduction, providing environmental protection and tackling climate change in developing countries by addressing unsustainable deforestation, access to clean energy and activities that support adaptation. Most of the finance available under this initiative will be channelled through the World Bank's CIF Facility, although early support to the Congo Basin Conservation Fund has been provided to address uncontrolled deforestation in that region.

MDG Fund – Spain

The Spanish Millennium Development Goals Fund, which include a thematic window on Environment and Climate Change, will support efforts to reduce vulnerability to climate change and poverty reduction. The fund will support: (i) interventions that improve environmental management and service delivery at the local and national level; (ii) activities that will increase access to new financing mechanisms; and (iii) efforts to enhance adaptive capacities.

Cool Earth Partnership – Japan

The Japanese Cool Earth Partnership will assist the adaptation and mitigation to climate change and has three priorities: (i) establishing a post-Kyoto framework that will ensure the participation of all emitters

and aim at fair and equitable emission targets; (ii) strengthening international environmental cooperation, under which Japan will provide assistance to help developing countries achieve emissions reductions and to support adaptation in countries suffering from severe climate change impacts; and (iii) supporting innovation that will focus on the development of innovative technology and a shift to a low carbon society. The Partnership will provide US\$ 2 billion as grant aid and technical assistance to support adaptation activities, whereas the bulk of the fund (US\$ 8 billion) will be made available as concessional loans to support mitigation activities.

International Climate Protection Initiative – Germany

The German International Protection Climate Initiative¹⁶ has three objectives: (i) supporting sustainable energy systems, adaptation and biodiversity projects related to climate change; (ii) ensuring that investments will trigger private investments at a greater magnitude; and (iii) ensuring that financed projects will strategically support the post-2012 climate change negotiations. For this purpose, it will also support multilateral activities and funds focusing on adaptation and forest management. The estimate for this fund is US\$ 60 million for 2008 (Le Goulven, 2008).

NORAD Rainforest Initiative – Norway

The Norwegian NORAD Rainforest Initiative is not a fund as such, but a pledge of earmarked funding to be allocated through the national budget. It will support the conservation of rainforests by promoting large-scale forest protection and the development of forest-based carbon management. More general measures will include support for adaptation and promoting clean energy in Africa.

2 Other funding sources: public and private investments and insurance

As the previous chapter showed, current global adaptation funds are limited and will not be able to meet the project needs. Therefore, financing climate change adaptation should, in all probability, have to largely tap into other funds. However, drawing from other investment sources may have additional benefits, as they may be better tuned to local needs, and draw upon existing structures and expertise, and are already targeted at essential sectors. This chapter identifies these other funding sources available for financing adaptation to climate change: public investments, private investments and insurance arrangements.

2.1 Public investments

Public investments in water infrastructures can take into account the need for adaptation to climate change. There are two types of modifications:

- Existing infrastructure may be upgraded:
 - Protective infrastructure: strengthening dams, coastal defences;
 - Non-protective infrastructure: reinforce roads built on melting permafrost, improving water management to cope with flood risks and water shortages;
- Climate change can be taken into account when designing new infrastructures (roads, railways, bridges):
 - Protective infrastructures: e.g. the Maeslant Barrier (the Netherlands) and reforestation projects;
 - Non-protective infrastructures: such as heat resistant and permeable roads (rainwater can percolate easier, smaller risk of inundation), the Confederation Bridge (Canada), energy infrastructure, water supply and demand infrastructure;

Disaster risk reduction and capacity building

Governments have made commitments to make the world safer from natural hazards through investing in Disaster Risk Reduction (DRR) approaches. Thus, climate change adaptation can be linked to disaster

¹⁶ See also http://www.bmu.de/files/pdfs/allgemein/application/pdf/klimaschutzinitiative_flyer_en.pdf.

risk reduction activities and improving poor people's livelihoods by integrating climate change adaptation concerns to national disaster risk reduction and poverty reduction strategies.

Future vulnerability reduction of communities at risk should include improving their capacities. Empowering affected populations so that they have a strong voice in recovery and rehabilitation after disasters, and the reduction of risk would increase their coping capacity. Therefore, public investments in building local capacity ought to be tunnelled toward the education and general awareness-raising on risk and climate change issues.

Box 2 – Financing climate adaptation in the Netherlands

The Dutch have a long tradition in water management which started early 1200. With regards to the institutional context, three levels can be distinguished:

On the national level, the Ministry of Transport, Public Works and Water management has the responsibility for water management. Within this Ministry, the Directorate-General for Public Works and Water Management sets out the general water policy, laws and regulations and is responsible for the primary flood defences. We work in close cooperation with other ministries in the fields of spatial planning, environment, agriculture, nature.

The provinces are the second level; they are responsible for regional spatial planning and supervise the regional governmental bodies.

The regional governmental bodies are the water boards and the municipalities. The water boards are the oldest democratic organizations of our country and they take care of the regional water management. Municipalities have their own water tasks in urban areas and deal with local spatial planning

When it comes to financing adaptation in the water sector, the flood protection and drainage investments are initially made by the Central Government. The operational and maintenance costs on the other hand are financed by the so-called 'water board taxes'. This assures that there is no competition for national budgets, while long-term planning is guaranteed.

Source: Vlaanderen (2008).

Box 3 – Financing Climate Adaptation in Ukraine

In some parts of Ukraine, the impacts of climate change are increasingly visible: there is an increased number of natural disasters, an increase of floods in the Carpathians, the steppes in the southern regions are turning into deserts, coastal areas get inundated (rise of the Black sea level is 1.5 mm/year) and there is an acute shortage of drinking water in the central and eastern regions.

A precondition for financing adaptation is the development of national and sub-national plans for different areas, and basins. The possible sources of funding to adapt to climate change in the Ukraine are:

State budget – Possible when the implementation of activities under the state programs contributes to climate change mitigation.

Loans – For the construction of large objects, like protective dams, treatment plants, irrigation systems, and the like, loans can be applied for.

State economic incentives – For example, credit concessions and allocation of funds from emission quotas sale for adaptation measures.

Private capital – Private capital can be attracted by means of the River Basin Councils and by the development of extra-budgetary targeted funds aimed at the implementation of adaptation tools that take into account all stakeholders.

Donor assistance – To draft a National adaptation strategy and adaptation programmes, donor support can be requested.

Source: Zakorchevna (2008).

Water pricing

Perhaps the best way to utilize water to the best and most-valued uses is to put a price on water, and construct appropriate tariff structures to meet different social, political and economic goals in different situations.

It has been argued that price policy can help maintain the sustainability of the resource itself: when the price of water reflects its true cost, the resource will be put to its most valuable uses (Rogers et al., 2002). Thereby, and assuming the poor can pay for such services, water pricing could contribute to adaptation and, for instance, if resources become scarce and water use is stabilized or reduced.

Furthermore, if water resources are managed in an integrated fashion where the economic, legal and environmental aspects complement each other, increased prices can improve equity, efficiency and sustainability of the resource. Thus in the future, water pricing mechanisms can be used to send a scarcity signal and help balance supply and demand.

There is a wide range of policy options available to implement price policy in the water sector. These range from direct pricing to green taxes, effluent fees, direct subsidies, utilities or to the users. The choice of policy depends upon the local political and social conditions, as well as the national economics. In addition, there are still many issues that need to be addressed, including an improved understanding of the environmental justice and equity consequences of water pricing.

2.2 Private investments

Private sector investments constitute a significant share of investment and financial flows and are thus another important means to enhance investment and financial flows to address climate change adaptation in the future. In terms of private funds, governments set the rules for the markets in which investors seek profits. Private capital flows, such as Foreign Direct Investment (FDI), could be influenced to support climate robust investment in infrastructure, business, or energy. Governments could look for ways to influence the major private investments in climate sensitive sectors, for example by providing incentives for risk reduction, and through regulation and standard setting that improves resilience.

If current market rules are failing to attract or drive private investors into more climate-proof alternatives, governments can introduce policies or incentives to help address these market failures. These include:

- Regulations and standards to overcome policy-based barriers to entry.
An example of such a policy can be found in Korea, where the Seoul Metropolitan Government and several other cities enacted regulations to enforce the installation of a new rainwater system

on the basis of the successful example¹⁷ (Han et al., 2008).

- Taxes and charges (polluter pays principle-PPP¹⁸).
In many countries, the PPP is based on the use of an environmental tax, which is determined proportionally to the amount of emissions of the polluting substances.
- Subsidies and incentives to pay the innovator.
Governments could ensure that policies facilitate innovation and dissemination of technology. For instance, intellectual property rights (IPR¹⁹), particularly patents, provide the primary means for assuring necessary private sector investment in the invention, development and deployment of the technologies needed to adapt (ICC, 2008). Governments can also shift the focus of their own investments. Governments are responsible for 10–

¹⁷ The Star City Rainwater Harvesting (RWH) system which is built at a newly-developed housing complex with 3,000 m³ of rainwater tank demonstrates that the safety and sustainability of current centralized water system can be increased by the addition of a Decentralized Rainwater Management (DRM) by mitigating the risk of flooding and reducing energy consumption. Seoul Metropolitan Government and several other cities enacted regulations to enforce the installation of a RWH system on the basis of the successful example of Star City project.

¹⁸ Note that the aging demographic structures of countries suggest that in the longer term increasing revenues from income taxes is likely to be more difficult than in the past. See also box 4.

¹⁹ Intellectual Property Rights serve a number of important roles, including: a) providing incentives for business to invest in risky (research) projects aimed at meeting market needs. Businesses will invest if they have reasonable certainty that they will benefit from their success. This certainty is provided by the ability to protect revenue through IPR; b) giving legal clarity and certainty for technology transfer transactions to take place. IPRs are necessary to identify what technology to transfer. IPRs provide the framework around which legal agreements for technology transfer can be structured; and c) enhancing, in the case of early patents, research and development as well as encouraging technology diffusion patents require the publication of technology, a valuable tool for research and development.

25% of the investment in new physical assets (UNFCCC, 2007). Currently, most of those investments are driven by local development priorities. In developing countries in particular, shifting funding to climate change related investments could increasingly take social and development priorities into account.

Note though that most developing countries might not have a policy base when it comes to private investments, nor do they have any standards or regulations. Without these being established correctly, taxes and charges can actually drive businesses away, especially since there will always be countries that do not require such taxes and charges.

Box 4 – Population Growth and Climate Change

In debates on how to adapt to the effects of climate change, is the burgeoning human population an elephant in the room? A projected 9 billion people will have to share a warming planet by 2050, yet the climatic effects of their rising numbers and shifting demographics has received surprisingly little study.

Numbers are exploding in the world's poorest societies, but they have low emissions per head. And in many countries in Europe – where reducing emissions levels is more pressing – populations are declining, so a demography-based climate strategy would be ineffective. In a generation's time, however, when developing countries begin industrializing apace, a large population could be bad news. Add the increase in urbanization as a consequence of an increase in population, and the picture worsens. Slowing the population growth and preventing climate-induced crises are therefore strongly linked; more people on the planet means more people susceptible to natural disasters such as floods, droughts, starvation – some of which are climate change induced. Adaptation to those changing conditions (including migration, if needed) is obviously much more manageable with eight rather than 11 billion people.

Source: Barnett, 2008

The private sector can only participate in large-scale adaptation initiatives on a commercial basis. Image and corporate responsibility are not sufficient. In partnership with the public sector, the barriers to entry can be overcome, and the public sector and

those at risk can benefit from the private sector's need to innovate and be efficient. Thus while it has to be recognized that public sector financing alone will not suffice to reduce vulnerability to climate risks, it is important to explore how the private sector can engage in adaptation mechanisms. Governments could start by developing policies to promote private sector investment in adaptive projects and influence development practices through improved awareness, incentives and regulation.

2.3 Insurance

Insurance can be regarded as an adaptation measure, as it transfers risk from localities to regional and global insurance and capital markets. People voluntarily purchase insurance as protection for excessive losses from extreme weather events when the risks are private, and often governments require compulsory forms of insurance or pooling when potential losses are unequally distributed across a population. Setting a price on risk through insurance premiums can also help to identify vulnerable areas, and promote the reduction of risk, by providing incentives such as reduced premiums or reduced deductibles.

The engagement of the private sector that calculates risk, such as the insurance sector, could provide opportunities to gain insight into risks, and ways to either transfer or reduce risks. Moreover, innovative insurance products, such as catastrophe bonds and weather index insurance systems (e.g. providing payments during drought), can play a viable role if tied to efforts aimed at vulnerability reduction.

2.4 Transboundary aspects: International coordination of policies

The impacts of climate change (on water resources) are likely to cross political and geographical boundaries. However, governments are typically short of funds and fund diversion from politically more urgent concerns at home to transnational activities is often politically sensitive. One mechanism to achieve greater funding may be specific earmarked taxes. These could either be levied by governments and earmarked for specific transboundary activities, or levied by the institutions themselves. Direct private sector investment is another option and, for obtain-

ing more secure, longer term financing, Endowment or Trust Funds, which can draw in government, private sector and donor funds. Other financing mechanisms identified by the DIDC (2001) are:

- 1 **Direct funding from taxes and charges** – Taxes and charges to fund environmental services have become widespread in the past 15 years, both in developed and developing countries. However, levying taxes or charges to support transboundary water management services is far more complicated and, moreover, there are only a handful of transboundary river commissions, for which this would apply.
- 2 **Private sector investments** – The role of the private sector – domestic or international – has been limited to revenue-generating projects and does not normally deal with public goods investments, such as transboundary water resources management. However, it can be argued that there is a role for the private sector in supporting international and regional public goods. The private sector investment most relevant to transboundary water management has been in hydropower where transboundary concerns frequently exist. Outside of hydropower development, however, there do not appear to be any instances of private sector involvement in transboundary water resources management.
- 3 **Endowments or trust funds** – Trust funds offer a plausible option for sustaining transboundary river institutions and longer term planning and programming. Because a trust fund must have a board of directors, it is in a strong position to encourage stakeholders to participate in the management of the resource – and the base for stakeholders can be quite wide, embracing NGOs, commercial enterprises and donors. Funds can provide a means for encouraging commercial and private sector participation either in kind, through providing management skills, or as direct financial contributions.
- 4 **Inter-riparian financing** – A fourth innovative financing mechanism concerns investments, made by some riparians in activities that are implemented in the territory of other countries²⁰.

²⁰ The closest parallel is perhaps the Clean Development Mechanism (CDM), proposed as a means to encourage reduction in greenhouse gas emissions. However, unlike emissions of greenhouse gases, the impact of

A form of permit, or allowance-based contribution for riparians could help such inter-riparian investments. Within a basin, wealthier countries might support investments in poorer countries, although there are few precedents for such an approach. Such a mechanism could be developed within a river basin whereby – if certain investments are needed in both a rich and a poor country – the richer one could make the water-related investment in the poorer one if it was a lower cost option, and realize a higher level of investment than would otherwise be possible. However, even where such international structures are effectively in place there are relatively few examples of inter-riparian financing.

The challenge for (transboundary) water managers is to find out how these mechanisms can be used towards the implementation of adaptation measures to climate change in their international river basin.

In general, costs of implementation of adaptation measures should be borne by each country and governments should make efforts to include budgets and economic incentives in relevant bilateral and multilateral programmes. The poorest countries, that are often also most vulnerable to climate change, should be supported by rich countries in their development towards climate proofing of water management (UNECE/WHO, 2008).

3 Discussion, conclusions and recommendations

According to estimates, at least US\$ 50 billion a year is needed to help poor people face the impacts of a changing climate, and far more if emissions are not cut fast and far enough. Investment needs for adap-

water-related activities varies significantly by location. For the emission of GHG the geographical location is immaterial, which makes the procedure conceptually more straightforward. Even so, the implementation of CDM is proving very difficult, given that the means for calculating GHG emission reductions and the implications for sustainable development (a core element of CDM) is yet to be adequately resolved. The position of such a 'trade' in a river basin is considerably more complex and would require some means of measuring equivalence between investments and their impacts on different stretches of a river basin system.

tation will almost certainly increase substantially in the latter decades of the 21st century. These projected needs cannot be met with the instruments inventoried in this analysis alone. In addition, the current global funds are inadequate with respect to their efficiency and fairness and insufficient when it comes to responding to developing countries' needs. The current financing architecture is primarily aimed at filling the gap until adaptation is mainstreamed in the overall development plans. These special mechanisms are for temporary practical purposes (or at least should be). And while promising steps have been made during COP14, an overarching harmonized strategic financial framework is still lacking.

It is therefore crucial to consider tapping into other international and multilateral (environmental) financing sources, as well as other domestic public and private sources. Private funding sources may cover a portion of the costs, and public resources are expected to play a dominant role in all sectors.

The future funding mechanism for adaptation needs to be sufficient, predictable, reliable and obligatory, not allocated through annual budgets, and it needs to be new funding, additional to aid.

In light of the above, several issues warrant attention and will be discussed in the next sections.

3.1 Duplication of activities among new funds

In the area of funding for climate adaptation, there appears to be an obvious overlap - at least in regard to objective - among the proposed new World Bank PPCR under the SCF framework, the Kyoto Protocol's Adaptation Fund and the existing funds to support adaptation by developing countries managed by and under the GEF.

In addition, activities carried out under the GCCA, the Cool Earth Partnership and the Spanish MDG Fund include mainstreaming of climate into development as a means of adaptation²¹. This points

²¹ The GCCA will focus on integrating adaptation plans into poverty reduction and development strategies. It plans to help develop the institutional capacity in LDCs and SIDS for mainstreaming and will focus on climate-proofing EU-funded programmes and projects. The Spanish MDG Fund also plans to support mainstreaming environmental issues in national and sub-national policy, planning and investment frameworks.

to a situation of funding overlap and complexity with, as yet, little sign of effective coordination.

The level of harmonization between the different initiatives cannot be determined at this stage. It is clear that initiatives have been donor-driven and talks between various initiatives have followed.

As indicated earlier, there are substantial uncertainties about how much funding the CDM market will generate for the Adaptation Fund, because it will depend on both the size of the market and on prices. The uncertainties associated with the market leaves open the possibility that the Adaptation Fund would seek funds from donors for adaptation as well. If this happens, there will be competition between the Adaptation Fund, the existing GEF-managed adaptation funds and the PPCR or a successor organization that plans to continue the same kind of work for some of the same bilateral donors' support.

The anticipated problem posed by the interaction of the PPCR with existing adaptation funds is not that they are doing the same thing, but that they might compete for funding from the same donors under the same rubric. The question, therefore, is whether donors are prepared to increase their funding for adaptation to support two different approaches or to support the new approach at the expense of the old one.

3.2 Other issues regarding new funds

The confusion about the relationship between adaptation and development is a definitional problem that has hindered not only project design, but also the allocation of funding for adaptation efforts. Among other key concerns raised since the appearance of the new funds is the question of whether the resources provided to the new funds by bilateral donors will be additional to existing ODA commitments²². At pre-

The Cool Earth Partnership will support the mainstreaming of adaptation measures in the formulation of development plans and support measures that facilitate coordination between sectors.

²² Adaptation and development policies are intertwined: climate change may affect development projects, the community / ecosystem benefiting from development projects may be vulnerable to climate change and the development projects may have effects on the vulner-

sent, it is still unclear how donor agencies will ensure that aid diversion does not occur as a result of these new funds. Climate-related finances will need to be classified and reported separately from developmental aid transfers. Failure to clarify the relationship has meant - and will continue to mean - that funding mechanisms create redundancies or leave gaps in the landscape of critical adaptation and development activities (McGray et al. 2007). See also Box 1.

3.3 Private investment sources

According to the UNFCCC, up to 86% of the global finance flows needed to respond to climate change will come from private investment sources (UNFCCC, 2007). However, in general, private sector engagement still appears weak. This, in turn, may be attributed to the slow development of climate policy frameworks and associated government policies, incentives and regulations. Financial institutions as well as insurers and institutional investors hold pivotal positions in this context. One of the most obvious opportunities²³ lies with investments in adaptation strategies and technologies.

Improvement in, and an optimal combination of mechanisms discussed in this document and new and additional resources, will be needed to mobilize the necessary investment and financial flows to address adaptation to climate change. Financial issues under a future climate change regime with increased effectiveness will require (UNFCCC, 2007):

- Shifts in investment and financial flows to more climate-friendly and climate-proof investments;
- Scaling up international and public capital dedicated to climate-friendly and climate-proof investments;
- Optimizing the allocation of the funds available by spreading the risks across private and public investors, for example by providing incentives for private investment in the early deployment of new technologies.

ability of the community / ecosystem to climate change (Klein et al., 2007).

²³ Others lie in the arena of renewable energy, cleaner energy, energy efficiency projects, carbon trading and carbon funds, and risk mitigation instruments.

3.4 Future requirements - financial architecture

With regards to the construction of an overarching financial architecture for climate adaptation funds, the following issues ought to be addressed (Porter et al., 2008):

- The need to scale up efforts and to act with greater urgency;
- The need for policy coherence;
- The need for independent coordination; and
- The need for North-South accord in carrying out measures for global environmental benefit.

Thus far, donors have shown no real interest in any alternative to the revision of the system implicit in the proliferation of new funds. But the needs of the system for coherence and effectiveness demand a serious consideration of a reform of the existing system in preparing for the post-2012 phase of international cooperation on climate change. Note that a serious barrier in implementation could be the absorption (disbursement) capacity of the recipient governments; hence an issue that deserves further research.

A process of harmonization among the new bilateral funds is urgently needed (Porter et al., 2008). As the publicly announced funds are translated from statements of commitment into operational terms that include geographic priorities, funding processes and qualifying criteria, the overlaps, redundancies, competing views and lack of synergies will become increasingly apparent. A harmonization process, initiated sooner rather than later, will deliver benefits to donors and recipients alike and significantly increase their combined benefits for the global environment and human enterprise.

The emergence of new funds and bilateral financing schemes over the past months indicates a realization among donors of the urgency and importance of adaptation measures. However, none of the funds are ear-marked specifically for a sector, let alone the water sector; all of the adaptation funds are linked to environmental agendas and fall under the responsibility of environmental ministries alone, while climate is broader than the environmental agenda and adaptation in the water sector flows across sectors. Similarly, adaptation investments at the national level should be optimized and move from stand-alone projects to sector-wide and programmatic interventions. An example is given in one of the other Perspective Documents on the inclusion

of climate change adaptation in the Strategic Environmental Assessments (Slootweg, 2009) where the scope is broadened and now includes the multi-sectoral level. Lastly, because the financing framework for adaptation is at an embryonic stage, the access to these funds as well as criteria (e.g. processes of disbursement, documentation needed and format of projects required) are under development and, as of yet, largely unknown. Finally, the myriad of funds adds to the level of complexity and uncertainty. Nonetheless, all things considered, now is a momentum to ensure that the initiatives complement and build on each other rather than undermine and duplicate each other.

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Marloes H.N. Bakker, Henk van Schaik

Co-operative Programme on Water and Climate, P.O. Box 82327, 2508 EH Den Haag, The Netherlands. m.bakker@cpwc.nl, h.vanschaik@cpwc.nl