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Human solidarity in a divided world

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International and National Mechanisms and Politics of Adaptation: An Agenda for Reform

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Focus on: International and National Mechanisms and Politics of Adaptation: an Agenda for Reform

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INTERNATIONAL AND NATIONAL ADAPTATION MECHANISMS AND STRATEGIES

Adaptation as a response to the climate change problem, has come on to the international policy agenda relatively recently and even slower on to the national policy agenda in most developing (and indeed developed) countries. The first countries to develop national adaptation plans of action (NAPAs) were the least developed countries (LDCs) with support from the LDC Fund under the United Nations Framework Convention on Climate Change (UNFCCC). Most of the LDCs have started their respective NAPAs and some have been completed. The experience so far has been just first step in raising awareness and identifying priority actions (in the form of projects) on adaptation amongst stakeholders at a national level. The completed NAPAs have identified a list of priority adaptation projects which the LDCs will seek further funding to implement. The experience with the NAPAs has been quote positive with respect to raising awareness of the climate change issues and identifying adaptation activities. They were meant to be carried out in a multi-stakeholder consultative mode and this was achieved to some extent. While they are a good first step, much more remains to be done to identify adaptation options (specially at policy and planning levels) in most of the LDCs and funding such adaptation activities remains a major bottleneck.

For the other developing countries various adaptation plans and activities have been undertaken on a piece meal basis, for example using the Adaptation Policy Framework methodology developed by the United Nations Development Programme (UNDP) in some countries. In a few of the bigger developing countries such as China, India, Brazil and South Africa the efforts at developing national adaptation plans are still at an early stage.

Ironically the developing countries (led by the LDCs) have been at the forefront of recognising the need to develop adaptation plans while the developed countries have lagged behind. The OECD has only recently started an effort to help address adaptation in the OECD countries and the European Union has only just started on its Adaptation Plan. Finland is one of the few developed countries to have actually have done a national adaptation plan.

Thus, the whole effort at developing national level adaptation plans and activities is still in its infancy (both in terms of practice and knowledge and tools of how to do adaptation planning) and much still needs to be done (and learned) as countries embark on their national adaptation plans and activities.

National Adaptation Programmes of Action (NAPAs)

NAPAs provide a process for LDCs to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. These urgent and immediate needs are those for which further delay could increase vulnerability or lead to increased costs at a later stage. The steps for the preparation of the NAPAs include identification of key adaptation measures and selection of a prioritized shortlist of

activities. NAPAs also include short profiles of projects and/or activities intended to address urgent and immediate LDC adaptation needs.

Each NAPA takes into account existing coping strategies at the grassroots level, and builds upon that to identify priority activities. In the NAPA process, prominence is given to community-level input as an important source of information, recognizing that grassroots communities are the main stakeholders. NAPAs should use existing information; no new research is needed. They must be action-oriented and country-driven and be flexible and based on national circumstances.

The rationale for NAPAs rests on fact that LDCs are amongst the most vulnerable countries to the adverse effects of climate change, in part because of their low capacity to adapt. NAPAs focus on enhancing adaptive capacity to climate variability, which will help LDCs address the adverse effects of climate change.

Article 4.9 of the United Nations Framework Convention on Climate Change (UNFCCC) recognizes the specific needs and special situations of the LDCs. Decision 5/CP.7 of the 7th Conference of the Parties (COP) also acknowledged the specific situations of LDCs, in that they do not have the means to deal with problems associated with adaptation to climate change, and established an LDC work programme including NAPAs as well as other supporting activities. Decision 28/CP.7 set the guidelines for NAPAs. Also related to the NAPA process, Decision 29/CP.7 set up an LDC Expert Group (LEG) to provide guidance and advice on the preparation and implementation strategy for NAPAs.

To date, nine of the 50 LDCs have submitted their NAPA to the UNFCCC: Bangladesh, Bhutan, Comoros, Djibouti, Madagascar, Malawi, Mauritania, Niger and Samoa.

Key Challenges from NAPAs

The main concern expressed by NAPA teams was how to secure funding for the activities identified in the NAPAs. The teams were also concerned about how best to mainstream NAPA projects into national development plans and strategies (Osman-Elasha and Downing 2007).

Another key challenge is ensuring that NAPAs don't just become another policy document, with no translation into concrete support for adaptation amongst the world's poorest and most vulnerable communities (Osman-Elasha and Downing (2007). "Countries are already bombarded with international obligations, which place considerable strain on already overloaded institutions with limited capacity, and which may well lead to duplication of effort and reduction in policy coherence" (Dalal-Clayton 2003).

Lessons from NAPAs

Although nine LDCs have submitted their NAPAs, many more are in the process of preparing their NAPAs and have already made significant headway in determining what

their countries urgent and immediate adaptation needs are. Of the NAPAs submitted to date, priority sectors covered by the assessments, and consequently those that are going to be the focus of the proposed NAPA projects are health, agriculture, water resources and forests. So far, none of the assessed countries considered coastal zones or marine resources. Although the NAPA assessments involved different population groups, more emphasis was placed on the rural poor. Stakeholder groups such as farmers, herders and fishermen were targeted, and less attention given to the urban poor. None of the assessments targeted specific vulnerable social groups such as women or refugees (Osman-Elasha and Downing 2007).

Despite these biases, NAPA assessment team members were generally multidisciplinary, and included representatives from the most vulnerable sectors. Assessments used Rapid Participatory Assessment tools as well as continual public consultation (at local, state and national levels) throughout the NAPA process. This helped identify good ideas and plans, and build consensus amongst stakeholders. The use of national workshops was a key component in ensuring the involvement of a wide range of stakeholders. Local workshops also helped in this regard, along with the use of individual and group interviews with selected key stakeholders (usually the most influential and knowledgeable people at the community level, including midwives, local leaders, teachers and extension officers).

In general, the projects identified in the NAPAs submitted to date are of two types: (1) sector specific projects, which focus on sectors such as water, agriculture and health, and (2) non-sector specific projects, which generally focus on broad cross-cutting themes such as information development. Most projects are sector specific projects and involve direct investment in adaptive actions. Most of these actions are planned at the sectoral level. The relative lack of community-based adaptation plans may be inherent in the development agenda of line ministries who often lead NAPA projects. In addition to direct investment, building capacity and mainstreaming into planning are considered high priorities. Relatively few of the projects are concerned with awareness, information or research. Lacking from the NAPA portfolio are projects focusing on institutional or structural reform or financial mechanisms (see the table below). This may reflect the NAPA guidelines, which focus on urgent action rather than strategic development planning. The result is that projects are largely very sectoral in focus without facilitating the significant structural and institutional reform required to effectively mainstream climate change into all national policy and planning activities. For example, whilst there are many projects with an agricultural focus, few projects address vulnerability using an integrated approach such as looking at food systems as a whole or addressing food security. Actions for reducing conflict and empowering disadvantaged communities are also not widely reflected in the NAPAs.

Although few NAPAs contain projects focusing on institutional or structural reform, some countries have included cross-sectoral projects when identifying their urgent and immediate adaptation needs. The boxes below provide two examples from Kiribati and Bangladesh.

Country: Bangladesh
Project: Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and

industry).
Cost: Full project USD 1 million; Design phase: USD 25,000

Objectives and activities

- To mainstream climate change impact assessment (and adaptation) into sectoral planning and policy in the disaster management, water, agriculture, health and industry sectors.

Inputs and Activities

- Climate change and sectoral experts to advise sectoral planners and policy makers on the ways of incorporating and mainstreaming climate change impacts into sectoral plans and policies.

Short-term outputs

- Greater awareness of climate change issues and their importance in sectoral planning and policies

Potential long-term outcomes

- Mainstreaming of climate change impacts (and adaptation) into sectoral plans and policies.

Source: Bangladesh NAPA

Country: Kiribati
Project: Project Management Institutional Strengthening for NAPA

Activities:

1. Mainstreaming NAPA
    a. NEPO assign staff members to provide oversight of mainstreaming of NAPA projects
    b. NEPO check consistency of NAPA outputs with NDS, CCA policy, and poverty reduction strategies
    c. Assigned staff members liaise with Ministries to include outputs of the NAPA projects into their MOPs
    d. NEPO and NAPA PMO provide guidance on defining outputs of the NAPA projects for inclusion in MOPs
    e. NEPO facilitate flow of financial resources for the NAPA
2. Monitoring and Reporting
    a. Incorporate NAPA monitoring and reporting into existing mechanisms
3. Awareness Raising and Materials
    a. Compile information on linkages of NAPA outputs to NDS, CCA Policy and Strategy, and pro poverty programmes and projects
    b. Compile information on available tools for vulnerability assessments and their economic implications
    c. Project planning for climate change adaptation
4. Workshops
    a. Workshops on NAPA mainstreaming
    b. NAPA Linkages with NDS, CCAs, KAP
    c. Vulnerability and economic implication of adaptation projects

Source: Kiribati NAPA

Examples of typical non-sector-specific project profiles

Project profiles	Comments
Awareness raising and knowledge dissemination	A number of projects aim to raise awareness across different scales 9~form community to policy makers).
Promotion of climate change research	Little projects address this. Perhaps because the NAPA is perceived as action oriented.
Education and curriculum development	No projects address this to date.
Enhancing the resilience of urban infrastructure and industries to climate change impacts	Very few – there is more focus on rural livelihoods.
Exploring options for insurance to cope with climatic disasters	Only two proposed projects explore insurance related issues.
Disaster management strategies	Not specifically mentioned. But most sector-specific projects are based on community experience with disaster and risk management.
Climate forecasting and early warning	Many projects address this issue.
Human and institutional capacity building	Many projects address this issue.
Policy reforms and institutional restructuring	Few projects propose institutional and regulation reform.
Removing barriers for technology transfer and adoption in different sectors	Use of modern technology is mentioned in relation to developing climate information and early warning systems, but not in combination with sector-specific adaptation measures such as farming systems or health.
Mainstreaming adaptation to climate change into various policies and programmes in different sectors	Although one of the guideline NAPA principles is mainstreaming into national development plans few African projects address this issue.
Promotion of indigenous knowledge	Although the NAPA development process is bottom-up in approach and is built on consultation with local communities, few projects aim to promote indigenous knowledge (skills, methodologies or technologies) as a basis for adaptation projects.

Source: Adapted from Osman-Elasha and Downing 2007

Generally the estimated cost for the proposed NAPA project ranges from US$300,000 to US$8,000,000, with the total number of projects ranging from 5 (Malawi) to 25 (Mauritania). The total cost required to fund these projects varies between countries, but generally ranges from US$21,000,000 to US$40,000,000.

The NAPA process to date shows that the cost of adaptation could be very high, to the extent that it could not be met by a single source of funding. The collection of adaptation projects from the LDCs supports the notion that funding for managing climatic risks will need to go beyond existing adaptation funds, perhaps through a tax on aviation for example, and beyond international climate change regimes to bilateral action.

A move from public to private sector funding, for example through micro-finance, could also be necessary, but this domain has not yet been adequately explored. Micro-finance could help deliver adaptation activities on the ground by giving poor people more control over their finances and increased security in the form of savings, livelihood diversity and insurance. It has been used to great effect by the Grameen Bank of Bangladesh, which has "been in the vanguard of the microfinance movement, showing the potential to alleviate poverty by providing credit to poor households." Grameen's pioneering use of group lending contracts with joint liability has reduced the problems of 'moral hazard' and 'adverse selection' where households are too poor to offer collateral. Until recently, Grameen has reported repayment rates of 98% and modest profits while serving over two million functionally landless borrowers (Morduch 1999). However, group lending contracts are less effective when everyone experiences the same crisis (for example, a widespread drought or flood) so government underwriting will be key.

The Bangladeshi NAPA

The Bangladesh NAPA was one of the first to be completed and submitted to the UNFCCC and was done following the guidelines provided by the LDC Expert Group (LEG). It was carried out by a multi-disciplinary team drawn from government as well civil society and held a series of five regional consultation workshops in five divisions of the country followed a major national workshop with participants from all stakeholder groups which collectively prioritised the list of potential adaptation projects into a set of fifteen priority projects.

The NAPA exercise was a participatory one with all relevant departments and ministries of the government invited to participate as well as members of civil society including NGOs in all the regional workshops. In addition the prioritisation exercise was done by including all the major stakeholder groups at the final national workshop to enable all stakeholders to make their contribution to the final list of prioritised projects.

The highest priority was given to coastal aforestation to combat sea level rise and salinity intrusion in the coastal belt of the country. Other projects identified drought prone areas and flood prone areas of the country. The project implementing agencies included government departments as well as NGOs.

The Adaptation Policy Framework

The Adaptation Policy Framework (APF) was developed by the United Nations Development Programme (UNDP) – Global Environment Facility (GEF) to guide the development and implementation of adaptation strategies. The APF starts with information that developing countries already have on agriculture, water resources, public health and disaster management, and tries to evaluate and complement existing planning processes to encourage policy making which incorporates climate change adaptation issues.

"Adaptation is a process by which individuals, communities and countries seek to cope with the consequences of climate change. The process of adaptation is not new; the idea of incorporating future climate risk into policy-making is. While our understanding of climate change and its potential impacts has become clearer, the availability of practical guidance on adaptation has not kept pace. The development of the Adaptation Policy Framework (APF) is intended to help provide the rapidly evolving process of adaptation policy-making with a much-needed roadmap" (Lim and Spanger-Siegfried 2005).

Lim and Spanger-Siegfried (2005) describe a number of case studies illustrating the range of situations in which the APF can be applied. One of these is the highland malaria case study from Kenya, reported by Kristie Ebi and Andrew Githeko.

Malaria in the Kenyan highlands

From a public health perspective, malaria significantly affects Kenyan health, society, and economy. The 1990 Global Burden of Disease study estimated that malaria accounted for approximately 10.8% of years of life lost across sub-Saharan Africa (Murray and Lopez 1996). In sub-Saharan Africa, malaria is the main cause of morbidity and mortality among children under five and among pregnant women. Roughly 1 million deaths (0.74 to 1.3 million) from the direct effects of malaria occur annually in Africa, more than 75% of them in children. This estimate could double if the indirect effects of malaria (including malaria-related anaemia, hypoglycemia, respiratory distress and low birth weight) are included when defining the burden of malaria (Breman 2001).

Rising temperatures under climate change could increase areas that are climatically hospitable to malaria vectors worldwide. The Kenyan government's policy on malaria control is based on quick diagnosis and effective treatment. But the number of people affected in recent epidemics was so high that the demand for drugs outstripped supplies (Githeko and Ndegwa 2001). This project aimed to develop an early warning system to increase Kenya's preparedness for malaria epidemics. Development of such an early warming system would increase preparedness for malaria epidemics thereby decreasing the social and economic costs associated with outbreaks of the disease. It used many of the techniques described in the APF, such as ensuring stakeholder inputs, assessing current vulnerabilities, establishing possible future scenarios to describe climate change risks and identifying barriers to adaptation.

Developing Country Adaptation Plans and Activities

So far only a few countries have developed country level adaptation plans (besides the completed NAPAs in the LDCs). Some countries that have done so include the small island countries in the Caribbean and Pacific.

Adaptation Challenges

The world's poorest countries have much to worry about in terms of providing schooling, healthcare, housing etc. to their people. Persuading them that climate change is something they need to consider is not easy when it seems such a low priority in comparison with so many other pressing concerns. Adaptation to climate change has become an important policy priority in the international negotiations on climate change in recent years, but it has yet to become a major policy issue within the developing countries, especially amongst the LDCs (which are particularly vulnerable to the adverse impacts of climate change). Much more needs to be done in terms of 'mainstreaming' adaptation to climate change within the national policy making processes in poorer nations (Huq *et al*. 2003).

In Bangladesh, for example, coastal zone managers recognize the utility of incorporating climate change issues into their programme planning. Mainstreaming climate change into planning undertaken by the coastal zone development community has been quite successful. Stakeholders involved with disaster mitigation (especially cyclones) were also quite receptive to the importance of climate change issues and have incorporated climate change adaptation into their ongoing disaster preparedness plans. Water sector planners have also been relatively quick to see the importance of climate change impacts on their national water sector plans and have agreed to incorporate climate change adaptation into the 25-year water sector plan under development. However, those involved in agricultural extension work do not recognize the importance of adaptation measures for their work, and it has been difficult to incorporate climate change into decision-making within the public health community. Perhaps the area of least success was in engaging with, and getting the interest of high-level policy makers (for example those representing the Prime Minister's office, Finance and Planning ministries as well as legislators). This group seemed least concerned about the impacts of climate change on the overall economy of the country and need to be targeted more effectively in any future efforts to do more on adaptation to climate change in Bangladesh (Rahman and Alam 2003).

In Mali, efforts made to mainstream adaptation to climate change into national planning and activities in different sectors have been relatively successful for the agricultural sector, which already has a long history of working on drought prone agriculture. In the area of energy mainstreaming has been moderately successful. However, in other sectors (such as water resources) and at the national policy making and planning levels, mainstreaming has been less successful (Konate and Sokona 2003).

Awareness is also low at the local level, where farmers, pastoralists and other community members may have noticed changes in the seasons or rainfall patterns, but do not attribute these changes to climate change. This is in part because most scientific climate change information is available at a broad regional scale of little use to national policy makers and

planners, let alone farmers who need to know likely rainfall scenarios in their local areas. Sectoral level policy makers, planners and managers are more likely to mainstream adaptation to climate change into their on-going and planned work if information on impacts is given to them in a suitable form. Climate science needs translating into a form which is relevant and useful for these decision makers and local people.

SUPPORTING ADAPTATION

Donor Investment Portfolios

Climate change has traditionally received little attention from international donor organizations and governments. A review of 136 projects in Africa funded by the German donor GTZ found no references to climate change (Klein 2001). International organizations such as the International Monetary Fund and World Trade Organization give little consideration to climate issues in their projects. Donor organizations and governments have increasingly begun to incorporate climate change into their development programmes (Agrawala 2004), but a study by the Organization for Economic Co-operation and Development (OECD 2003) revealed the magnitude of development assistance and aid in sectors potentially affected by climate risks. In Egypt and Bangladesh alone, from 1998 to 2002, between US$1-2 billion was directed towards sectors affected by climate change and climate variability. As much as 50-65% of development aid in Nepal was given to climate-sensitive sectors. Clearly, international donor agencies need to assess the extent to which their investment portfolios in developing countries might be at risk due to climate change and take steps to reduce that risk.

A number of bilateral and multilateral donor agencies (as well as NGOs) have started to examine their own investment portfolios for climate risks with a view to identifying and taking adaptation measures to enhance the resilience to climate change of those investments. These include the World Bank in India, the United Kingdom's Department for International Development (DFID) in India, China and Kenya, the Netherlands Department for Development Assistance (DGIS) in Bolivia, Bangladesh and Ethiopia and the International Institute for Sustainable Development (IISD) and IUCN.

A major challenge faced by international donor agencies (including both bilateral as well as multilateral) are knowing the extent of vulnerability to climate change of the investments they are funding as well as for different parts of the country in which they are investing. The information on potential adverse impacts is still too coarse to make those kinds of refined assessments. It is also difficult to decide what exactly constitutes an adaptation-to-climate-change activity which distinguishes it from normal development activities or projects or even from adaptation to climate variability. This is still work-in-progress and much needs to be learned about what and how to identify an adaptation project.

Best Practice in Supporting Adaptation: the RVCC Project

Bangladesh has always been vulnerable to extreme environmental events but climate change could magnify its environmental problems. Being a low-lying delta with much of its land barely above sea level, Bangladesh could lose a significant part of its land in the next 50 years due to rising sea levels. Drought in the dry season may be more severe while rain in the wet season may be more intense. The livelihoods of the ten million people living in the southwest region of the country are highly dependent on the natural resource base, and are therefore extremely vulnerable to environmental changes such as increasing salinity and waterlogging. In addition, this region is prone to natural disasters such as tropical cyclones, floods, unusual high tides and riverbank erosion. Climate models predict that this region will be increasingly vulnerable to the adverse impacts of climate change, including sea level rise.

The Reducing Vulnerability to Climate Change (RVCC) Project is implemented by CARE Bangladesh with the support of the Canadian International Development Agency (CIDA). The project was launched in January 2002, and the first phase of activities was completed in March 2005.

The RVCC Project works in partnership with local non-governmental organizations (NGOs) and community-based organizations (CBOs) in the six districts of the southwest region of Bangladesh. Its goal is to increase the capacity of communities in the southwest region of Bangladesh to adapt to the adverse effects of climate change. The expected impacts of the project are:

- Vulnerable Bangladeshi communities understand and are better able to respond to adverse climate change effects.
- Local organizations (NGOs and CBOs) are better able to understand and explain climate change and have the skills and knowledge to advocate on climate change.
- Agencies of local and national government are sensitized to the need for strategic interventions to enhance adaptation to climate change for vulnerable communities.

The RVCC approach addresses vulnerability to climate change through awareness, action and advocacy. As part of its work on awareness, the project conducted a study on knowledge, attitudes and behaviour related to climate change. Based on this it designed a campaign to build awareness of climate change issues and adaptation measures that could sustain livelihoods. The project also supported several activities (or actions) to reduce vulnerability. At the household level these included drought-resistant crops, floating gardens, duck and poultry rearing, rainwater harvesting, cottage industries, introduction of portable cooking stoves and flood-proof food storage, and storm-resistant housing. At the community level these included increasing access to common property resources, and reducing threats through community-based initiatives such as tidal river management, raising embankments, cyclone shelters and canal excavation. Project advocacy work focused on the potable water crisis in the context of increasing salinity in southwest Bangladesh.

The RVCC Project has achieved considerable success in piloting an approach to climate change adaptation at the grassroots level through awareness, action and advocacy. Significant results have been achieved in all areas: awareness of climate change issues has been raised at multiple levels throughout the southwest region; vulnerable households are testing agriculture and livelihood measures that will reduce their vulnerability to

environmental change; Union Parishads (local government bodies) have greater capacity to address vulnerability issues in their constituencies; and the issue of salinity and drinking water is gaining attention by decision-makers at local, regional and national levels.

The learning-by-doing process adopted by the project has generated many important lessons that can inform the design of future programme work on adaptation to climate change, or of livelihoods projects aiming to incorporate climate change considerations. In March 2005, a number of workshops were held with key stakeholders to identify these lessons, which are described below (Chowhan and Barman 2005).

Strategic lessons learned relating to RVCC's approach include:

- An integrated approach to implementation of activities at household and community levels, as well as awareness and advocacy, increases the impact of interventions.
- Allowing sufficient time for project design, inception and implementation will increase the sustainability of interventions.
- A participatory approach to implementation increases the capacity of all stakeholders and creates a sense of ownership.
- Incorporation of gender issues at activity and organizational levels continues to be a challenge.
- Incorporating risk assessment and mitigation into project planning will improve results.
- All project activities must be planned with the participation of project participants and target audiences.

Lessons related to capacity development and partnership are as follows:

- Capacity development is a long-term process, and the project timeline should reflect this.
- Undertaking an organizational capacity assessment early in the project assisted project partner NGOs in identifying their strengths and weaknesses and helped address these weaknesses.
- Selection of appropriate partners is crucial for intervention effectiveness and efficiency.
- Partnership is a mutual learning process, which enhances the capacity of both partners.
- The partner organizations had strong backgrounds in their particular areas of expertise. However their level of knowledge and understanding of climate change issues occasionally hampered project activities.

Strategic lessons relating to awareness are:

- As climate change is a technical issue, it has been challenging to communicate at the grassroots level in an accessible way.
- Awareness raising activities should be integrated into other project activities to increase impact.
- Involving members of the target audience in the development of communication tools and testing the tools at the audience level can improve the relevance of the materials and the messages.

Lessons relating to action at the household level are:

- Diversification of income opportunities and food production methods through measures that are appropriate to local environmental conditions can improve food and economic security in vulnerable communities.
- Identification and dissemination of suitable rice varieties and agricultural practices for saline and waterlogged areas can contribute to increasing food security.
- Access to microcredit is an important consideration when selecting adaptation measures for implementation.
- Alternative livelihoods require an associated marketing strategy in order to be successful.
- Taking a 'household' approach through the inclusion of male and female members of a household in project activities was more effective than working with a single household member.
- A functional and trained water management committee must be in place, and social, technical and environmental feasibility assessed, before any water system is installed.
- Services from government service providers can be obtained by empowering participants and linking them directly to these agencies.

Lessons relating to action at the community level are:

- Addressing resource and capacity constraints would bridge the gap between awareness and capacity to take action.
- Participatory resource mapping exercises can play an important role in the preparation of road maps for development by Union Parishads (local government bodies).
- In addition to working with Union Parishads it is practical to work at the Upazila and Zila (district) levels.

Lessons relating to advocacy are:

- Partnering with a civil society organization has increased the momentum and reach of the advocacy campaign.
- Working in partnership with local and national level NGOs for advocacy activities is an effective approach.
- Advocacy should not only focus on climate change issues, but should consider other agents of change that contribute to vulnerability.

Best Practice in Governments

The governments that have made most progress in developing national and project based adaptation plans ands activities are the island countries in the Caribbean and the Pacific. Thus, for example the Caribbean countries have developed a country-by-country regional Climate Change plan with a regional centre based in Belize while the Pacific islands of Fiji, Kiribas and Samoa have carried out national adaptation assessments and started to implement some adaptation projects by the governments. Most other developing countries have not yet begun to carry out any specific adaptation projects yet.

FINANCIAL MECHANISMS TO SUPPORT ADAPTATION

Several financial mechanisms exist under the United Nations Framework Convention on Climate Change (UNFCCC) to support adaptation activities, particularly in developing countries. These are the Least Developed Countries Fund, the Special Climate Change Fund, the Adaptation Fund and the Strategic Priority on Adaptation. The Global Environment Facility (GEF) manages most of these funds. One of the most significant achievements of the 11th Conference of Parties (COP11) to the UNFCCC, and first Meeting of Parties (MOP1) to the Kyoto Protocol held in Montreal, Canada, at the end of 2005, was the adoption of the Marrakech Accords. These were originally negotiated in Marrakech, Morocco, during COP7 in 2001 and included the funds named above. Adoption of the Marrakech Accords meant that these funds became operational (Huq 2006). These funds are described below in addition to other bilateral funds that have been established.

The Least Developed Countries Fund

The Least Developed Countries Fund is already functioning. It contains voluntary contributions from several Annex 1 countries (industrialized countries which have signed the UNFCCC). It has already supported the development of National Adaptation Programmes of Action (NAPAs) by the Least Developed Countries (LDCs) using guidelines drawn up by the LDC Expert Group. The NAPAs are supposed to identify urgent and immediate adaptation actions needed in each country and provide a prioritized list of adaptation projects. The Fund currently has around 100 Million Dollars pledged to assisting the LDCs to support their priority projects identified in their respective NAPAs.

The Special Climate Change Fund

The Special Climate Change Fund is for all developing countries and covers adaptation and other activities such as technology transfer, mitigation and economic diversification. The operating rules for the fund have been agreed, and funding for adaptation is classed as a ‘top priority’ activity. It is also based on voluntary contributions from wealthy countries and currently has a several hundred Million Dollars pledged to it. It has started to support some adaptation projects in a few developing countries.

The Adaptation Fund

The Adaptation Fund is meant to support ‘concrete adaptation’ activities. It was established under the Kyoto Protocol, whereas the first two funds were established under the UNFCCC. As the Montreal meeting was the first Meeting of the Parties to the Kyoto Protocol, the fund has been dormant until quite recently. The fund was discussed in Montreal but operating rules were not agreed. Developing countries felt that it should not be managed by the GEF, while developed countries wanted the GEF to manage it. At

COP12 in Nairobi in December 2006, the status of the GEF with regards to fund management was not agreed, but an architecture for fund operation, and several operating principles were. This is important because the Adaptation Fund, unlike like the other UNFCCC funds, is based on private sector replenishment though the 2% CDM levy and is also the 'natural home' for additional private sector contributions. It could therefore become much more important than the other UNFCCC funds, and thus needs a satisfactory governance structure (Abdullah *et al*. 2006). Details of the fund's operation are still being negotiated and are expected to be agreed at COP13 to be held in Bali, Indonesia in December 2007.

The Strategic Priority on Adaptation

The Strategic Priority on Adaptation was also recently established by the GEF. It contains us US$50 million from the GEF's own trust funds to support pilot adaptation activities over three years starting from 2006. The fund is already supporting several adaptation projects, but it is unclear whether it will continue after the pilot phase. Projects must also pass the GEF test of 'global environmental benefits' to be eligible for funding, which makes funding adaptation activities problematic as it can be difficult to draw a clear line between what differentiates adaptation from other development activities, and what differentiates climate change from climate variability. These limitations (although they have been relaxed slightly) severely limit the types of adaptation projects that can be funded.

Status of UNFCCC/GEF funds for Adaptation

Fund name	**Amount available (in US$ millions)**	**Eligibility**	**Fund source**	**Activities funded so far**
Least Developed Countries Fund	48.27 received plus 104.81 pledged. Pledges are submitted on a revolving basis.	Least Developed Countries (LDCs) only	Voluntary contributions	National Adaptation Programmes of Action (NAPAs) in 45 LDCs
Special Climate Change Fund	61.52 pledged plus 40.62 received	All developing countries	Voluntary contributions	Projects being developed in /on Ecuador, health, The Andes and The Pangani River
Adaptation Fund	5 (pledged by Canada)	All developing countries	2% adaptation levy on Carbon Emission Reductions (CERs) from Clean Development	None

			Mechanism (CDM) projects. Plus voluntary contributions.	
Strategic Priority on Adaptation	50 (over 3 years). Pilot to be evaluated.	All developing countries	Global Environment Facility (GEF) trust funds	1. Community Based Adaptation project (through the United Nations Development Programme - UNDP) 2. The Adaptation Learning Mechanism (through the UNDP) 3. Kiribati project (through the World Bank) 4. Colombia project (through the World Bank) 5. Coping with Drought project (through the UNDP) 6. Adapting to shoreline change in West Africa (through the UNDP) 7. Pilot adaptation project in Dominica, Saint Lucia and Saint Vincent and the Grenadines 8. Integrating Vulnerability and Adaptation to Climate Change into Sustainable Development Policy Planning and Implementation in East Africa (through the United Nations Environment Programme)

Bilateral Funds

A number of bilateral funding agencies have also set up adaptation funds of various types and sizes. These include the Canadian International Development Agency (CIDA) as well the UK's Department for International Development (DFID).

A number of bilateral funding agencies have allocated funding for adaptation activities (including research and some pilot projects). These include an allocation for adaptation by the Canadian International Development Agency (CIDA) for projects in Bangladesh and Vietnam, as well as the UK's Department for International Development (DFID) for adaptation research in Africa and the Swedish International Development Agency (Sida) for activities in selected developing countries. More bilateral development funding agencies are now beginning to allocate amounts for adaptation in developing countries amounts are only likely to be in the tens of Millions of Dollars.

The Millennium Achievement Fund

This UNDP-UNEP partnership was launched in 2006 to help developing countries factor climate change into their development plans in areas from infrastructure development to agriculture and health. It has secured pledges for funding from Spain and other prospective European donors, and aims to address two main areas:

1) To reduce the climate vulnerability of the poor and to build their resilience to the effects of climate change
2) To enhance the capacity of both public and private sector in sub-Saharan Africa and other countries to successfully access the CDM.

Key Challenges

A major challenge for those financing adaptation is the need to separate out the additional costs of climate change adaptation from 'business as usual' development activities. Likewise, the difference between vulnerability to climate change and vulnerability to climate variability and other environmental vulnerabilities needs explaining. These differentiations pose many practical challenges but are necessary in order to distinguish between the responsibility (and hence liability) of industrialized countries to pay for the damage they have caused, and funds donated under the banner of philanthropy or charity.

From a climate change adaptation fund perspective the desire of proving additionality of the investment is understandable but if it leads to excessive problems in practice (as is indeed the case) then a more pragmatic solution needs to be developed which enables adaptation activities to include a wide range of activities that enhance the resilience of vulnerable populations or countries without having to prove the additionality of adaptation to climate change. The LDC Fund has taken such a pragmatic approach where a sliding scale is applied to projects in which countries applying can decide to apply for the full cost (up to a certain limit) or to partial costs (and find the matching costs from elsewhere above those limits) with the proportion of LDCF funding being provided on a sliding scale with size of funds being requested by the country).

Another key issue to be resolved is who and what should be prioritised for receiving international funds for supporting adaptation in developing countries? Should some countries receive priority over others or should some sectors and communities be prioritised (and if so on what basis) Options include levels of vulnerability,. number of poor/vulnerable people, needs for urgent action, etc. These issues are still under discussion in the UNFCCC and the various funding agencies themselves and are yet to be resolved.

Policy Prescriptions for Funding Adaptation

At present the adaptation funds that are available have been directed at either adaptation research, planning or specific adaptation projects. No funds have been made available for more programmatic adaptation activities in developing countries yet. It should be interesting to explore how the adaptation needs may shift away from projects to more programmatic activities in future. It is likely that as experience is gained in the practice of

adaptation at the project level more programmatic adaptation activities may be included for funding support.

Another issue to consider is the possible risks of proliferation and fragmentation between donors and GEF / private funds and the need to harmonise investments. Activities may need to be divided depending on the comparative advantages of each source (e.g. donors – climate proofing existing national / donor-funded development programmes; adaptation funds targeting specific adaptation measures and institutional capacity building, etc).

The Potential of New Insurance Arrangements

One area of growing interest is the use of insurance as means of assisting adaptation activities. This also includes the potential for public/private partnerships between governments as well as insurance companies. Some exploratory insurance schemes have been initiated in India (where the World Bank has experimented with crop insurance in Andhra Pradesh) and Ethiopia (where the World Food Programme has provided weather-loss insurance to farmers). However, experiences so far are insufficient to warrant large-scale deployment of insurance as a means of supporting adaptation to climate change.

The Munich Climate Insurance Initiative

Article 4.8 of the United Nations Framework Convention on Climate Change (UNFCCC) and the supporting Article 3.14 of the Kyoto Protocol call upon developed countries to consider actions, including insurance, to meet the specific needs and concerns of developing countries in adapting to climate change. But to date, there is little understanding of or agreement within the climate change community on the role that insurance-related mechanisms can play in assisting developing countries adapt to climate change (Bals *et al*. undated).

The Munich Climate Insurance Initiative could help provide research and ideas on insurance for climate risk, particularly for poor people. In April 2005, five organizations and some independent experts met in Munich at the invitation of Munich Re to explore their common interests in climate change risks and insurance. They agreed on a collective initiative for three purposes:

1) to serve as a research network and ‘think tank ’;
2) to provide a source of ideas about possible climate risk related insurance products and programmes; and,
3) to support the expansion and accessibility of climate related insurance, especially in developing countries and among low income populations.

Given the failure of purely market driven processes to provide adequate insurance at affordable rates, the Munich Climate Insurance Initiative (MCII) is exploring various modes of public-private partnerships. These could be developed under the UNFCCC or under some other institutional arrangement. MCII members recognize the considerable challenges of developing insurance products through public-private partnerships that avoid

the risks of 'adverse selection' (this is when only those who are certain, sooner or later, to suffer loss purchase insurance. For example, only those on floodplains want to buy flood insurance and this works adversely against the idea of spreading risk over a large population as occurs with fire insurance), and 'moral hazard' (this is the unintended consequence of insurance when it encourages more risk taking. The idea is that those with insurance make less effort to avoid risk). The MCII seeks to address these issues and to find ways to use insurance not only as a mechanism for spreading and sharing risk but also as a social policy instrument to help promote adaptation to climate change (Burton 2006).

The MCII makes a set of recommendations for insurance related options for adaptation to climate change (Bals *et al*. undated). These are as follows:

1. Organizations and other stakeholders in climate change, disaster management, and development should take a serious interest in the potential of insurance and insurance-related mechanisms to spread and reduce the losses from events related to climate change and climate variability.
2. Based on the needs of communities at risk, a wide coalition of interested bodies should advance the climate insurance agenda more aggressively. The evolving interest and actions in the area of climate insurance should be closely related to activities in the disaster mitigation field.
3. In particular, the UNFCCC process, including the Subsidiary Body for Scientific and Technological Advice (SBSTA) and Subsidiary Body for Implementation (SBI), should extend its consideration of insurance-related mechanisms. Consideration of the scientific and technical aspects of climate insurance should be a central theme in the new five-year program of work on adaptation now being designed in the SBSTA.
4. A rigorous technical, financial and policy assessment should be made of the need for and the low availability of private or publicly-funded insurance in the climate risk area, the reasons for this, and the possible response options.
5. Existing climate and disaster insurance initiatives should be carefully assessed and lessons drawn concerning their potential for replication or further expansion. It should be assessed how these mechanisms can be made complementary to traditional solidarity based coping strategies instead of risking to undermine them.
6. A possible approach that should be explored and developed is the utilization of pilot projects. Existing pilot projects could be built upon and more could be developed to learn by experience. Recent pilot projects providing indexed weather derivatives in India and other countries could serve as examples.
7. The potential role of climate-related insurance should be a factor to be considered in the negotiations concerning the post-2012 regime under the Kyoto Protocol.
8. Recent concrete proposals, for example, on the part of GermanWatch and the International Institute for Applied Systems Analysis, could serve as a basis for discussions and formulations of a negotiated agreement in the context of Article 4.8, which calls for the consideration of insurance to help developing countries adapt to climate change. These proposals call for a facility to support insurance-related actions, and these actions can now be grounded in recent experience of donor-supported insurance systems that are affordable to low-income, high-risk regions.
9. The most effective way forward is a public-private partnership, where insurance-related systems are coupled with explicit measures to prevent disasters. The private sector can play a vital role in climate insurance systems for developing countries.

Founding members of MCII include Munich Re, Germanwatch, the International Institute for Applied Systems Analysis, the Tyndall Centre, The Energy and Resources Institute – Europe, the Potsdam Institute for Climate Impact Research and the Swiss Federal Institute of Technology. Independent experts include Ian Burton and Frank Sperling (from, but not officially representing, the World Bank).

CLIMATE CHANGE AND DEVELOPMENT LINKS

The problem of human-induced climate change first came to the attention of the global public and international policy-makers when the Intergovernmental Panel on Climate Change (IPCC) published its first assessment report in 1990. This drew attention to the significant increases in atmospheric greenhouse gas concentrations observed over the last 150 years since the start of the industrial revolution. However, despite the magnitude of its likely impacts on the least developed countries, until recently climate change has been viewed largely as an environmental concern, of little relevance to development policy-makers or practitioners. Likewise, development approaches have been given less attention within the climate change community, who instead favour natural science approaches focusing on reducing greenhouse gas emissions.

The link between climate change and development should be obvious. Climate change impacts will significantly affect national development, particularly amongst the world's poorest communities. In turn, alternative development pathways will determine future greenhouse gas emissions and influence the capacity of communities and countries to adapt to climate change. So why haven't the two areas been working well together? The two main reasons for this are described below (Huq *et al*. 2006).

Firstly, the climate change and development communities have operated largely independently of one another, in both research and policy. Climate change is dominated by the natural sciences, and development by the social sciences. In the 1980s, natural scientists first brought attention to the problem of global warming, and since then, the political process that surrounds climate change continues to rely on the natural science community for information. In contrast, the development community is made up of a multitude of social sciences trying to identify and describe the social, political and economic obstacles to development. Environmental problems (such as natural resource scarcity, land degradation and pollution) are recognised as impediments to development, but climate change has largely escaped notice. Climate change science is generally most robust on issues related to emissions and mitigation, which tend to have less direct relevance for poverty alleviation and development. The scientific knowledge of the impacts of human-induced climate change is less certain.

Secondly, the problems are perceived at different temporal and geographic scales. Many development practitioners view climate change as a long-term problem that does not compare with more urgent concerns such as food security or HIV/AIDS. Much climate change discourse is based on long-term projections generated by Global Circulation Models that typically run up to 100 years, and in the case of sea level rise, for several hundred years. In contrast, most development scenarios are much shorter term. For

example, most Millennium Development Goals are set for 2015. Another obstacle is differing geographical scales. Climate change science is continuously improving, but until recently, most literature could not confidently predict impacts at regional or local levels. While regional models are increasingly robust, development work requires more certainty at local and national scales.

Growing Climate Change and Development Links

Links between climate change and development used to be clearly drawn. In 1992, the United Nations Conference on Environment and Development (UNCED) produced Agenda 21 and the Rio Declaration, both of which made explicit the intractable connection between climate change and sustainable development. Back in 1987, the seminal Brundtland Report, *Our Common Future*, cited climate change as a major environmental challenge facing development. And yet, since then, the climate change and development fields have evolved separately. A few development organizations, such as CARE International, have incorporated climate change into their development projects for some years (Chowhan and Barman 2005), but the development community as a whole has largely ignored the affect climate change impacts will have on development goals.

In recent years, climate change and development discourses have begun to link up more. This began with the establishment of the Vulnerability and Adaptation Resource Group (VARG) consisting of an informal network of bilateral and multilateral institutions. VARG's mission is "to facilitate the integration of climate change adaptation in the development process through the sharing, assessment, synthesis, and dissemination of existing knowledge and experience" (http://www.climatevarg.org/). VARG helped produce a seminal report on poverty and climate change, to which ten of the leading bilateral and multilateral development funding agencies contributed (see Sperling 2003). This marked a major shift by the development community to incorporate climate change into their thinking.

The 2002 World Summit on Sustainable Development brought renewed attention to the climate-development nexus. Bilateral and multilateral agencies, such as the World Bank, the German donor GTZ, the Norwegian Agency for Development Cooperation (NORAD), the United Kingdom Department for International Development (DFID) and Canadian International Development Agency (CIDA) are now investigating the linkages between climate change and development assistance (see, for example DFID 2003). Efforts have also been made in different development sectors, such as human health (WHO 2004), agriculture, disaster management (Red Cross/Red Crescent 2002) and water resources management.

Many international development organizations have since launched projects to address climate change. ActionAid, CARE, Christian Aid, Oxfam, Progressio, Practical Action, The Red Cross and Red Crescent Societies, Tearfund and others, recognize that climate change is a major issue for the world's poorest people, and are exploring ways to integrate climate change into their development work. Such integration is needed at both programme and policy levels. At the policy level, much progress has been made. The International Federation of Red Cross and Red Crescent Societies has established a Centre on Climate

Change and Disaster Preparedness in The Netherlands. Christian Aid has recently released a major report focusing on climate change and poverty (McGhie *et al*. 2006). ActionAid and Oxfam are both exploring ways to mainstream climate change into their campaigning and policy work and Tearfund has been actively campaigning on climate change and disasters for several years. Many of these organizations are also part of campaigning and policy coalitions focusing on climate change, such as the Working Group on Climate Change and Development (or the 'Up in Smoke' Group), a coalition of roughly 20 environment and development NGOs (Simms *et al*. 2004), and the Stop Climate Chaos Coalition.

Research organizations such as the Climate Change Knowledge Network, The Energy and Resources Institute (TERI), the Stockholm Environment Institute (SEI), the Institute of Development Studies (IDS) and the International Institute for Environment and Development (IIED) have all expanded climate research to include development issues and *vice versa*.

Despite these efforts, most government agencies in poor countries, and most local-level development groups still do not adequately incorporate climate change into their development activities. Some sectors and ministries in poorer countries have made more progress than others. In general, the agriculture and food security sector, water managers and planners and those planning for disasters have done more than their counterparts in other development sectors to 'climate proof' their national policies and planning processes. Sectors such as coastal zone management, urban planning, health, infrastructure development, security, energy policy, forest management and biodiversity conservation have made little headway in this regard (Huq *et al*. 2003).

Strengthening Integration - The Way Forward

Much progress has been made in bringing the development and climate change communities together. This needs to be built on and improved. Climate change needs to be incorporated into development programmes at international, regional, national and local levels. It should not simply be delegated to environmental organizations, programmes and ministries, but incorporated into all levels and branches of government, NGO, bilateral and multilateral institutional development activities.

Climate change research and negotiations are still dominated by concerns about reducing emissions amongst industrialised nations (mitigation) rather than dealing with climate change impacts (adaptation). Although some parties to the negotiations fear that attention on development linkages will detract from efforts to reduce emissions, it has become increasingly clear that the world will need to adapt to a changing climate. Even if industrialized countries significantly lower their emissions levels with immediate effect, a certain degree of anthropogenic climate change is inevitable due to the lag time in the global climate system. In addition, developing countries, which have contributed little to the problem of climate change, will not fully participate in UNFCCC negotiations or implement national climate change mitigation and adaptation policies if there are no clear development benefits for them.

Many environmental problems require a common response, and the limited resources of many countries precipitate the need to find ways to streamline these resources to address all environmental problems together. For example, there are inherent links between biodiversity loss, climate change and desertification. All threaten sustainable development, especially in poor countries. The Joint Liaison Group between the three main environmental conventions - the UNFCCC, the Convention on Biodiversity and the United Nations Convention to Combat Desertification - was established with this in mind.

The IPCC is the main body responsible for assessing the literature on climate change. Its first two assessment reports only investigated the evidence for climate change, its impacts and the cost-effectiveness of policy options. The Third Assessment Report went the furthest to address development linkages and it is expected that the upcoming Fourth Assessment Report, due in 2007, will integrate sustainable development into all aspects of the report and further explore the integration of development and climate change policies.

Climate change has traditionally received little attention from international donor organizations and governments, which need to assess the extent to which their investment portfolios in developing countries might be at risk due to climate change and take steps to reduce that risk. Developing country governments also need to understand the extent to which they may be vulnerable to climate change and take steps to reduce vulnerability (and enhance adaptive capacity) of the most exposed sectors and populations. Many local communities are already adapting to the impacts of climate variability and climate change on a daily basis. Their experiences can offer lessons for national governments wishing to support adaptation activities. Diversification of livelihood sources, improved infrastructure, education and institutional strength all help to reduce vulnerability to climate change as well as encourage socio-economic development.

The adaptive capacity of those affected by climate change ultimately depends on their access to economic, ecological, social and human resources including institutional structures, decision-making processes, information and public awareness. Adaptation policies can only be effective if they are built into the wider development agenda, both in developed and developing countries. The need to ‘mainstream’ climate change adaptation policies into national development programmes has become increasingly apparent (Huq *et al*. 2003).

Challenges for Development NGOs Supporting Adaptation

For international development organisations, ‘mainstreaming’ climate change into activities at a country or programme level is perhaps a greater challenge than integrating climate change into work at the policy level. Project or programme managers based in poorer countries are already under considerable pressure to run effective projects, dealing with all the complex local issues that this involves. For many of them, requests from central office to mainstream climate change into their work (just as they had to mainstream HIV and gender in the past) seem a low priority, and an additional top down bureaucratic requirement preventing them from doing their work properly. And yet a failure to incorporate climate change into development planning and activities can lead to years of

wasted development efforts and funding. For example, in 1985 a glacial lake outburst in Nepal destroyed a newly completed World Bank funded hydropower dam.

At worst, a failure to incorporate climate change into development work can lead to 'maladaptation' leaving people more vulnerable to climate change impacts than they were before. For example, some development plans may increase dependency on climate-sensitive resources, such as rain-fed agriculture, thereby increasing vulnerability. Many African countries, influenced by external donors, are reforming their water sector (including reforming water rights), which could reduce water access among the poor, and therefore increase their vulnerability to droughts. Poverty reduction activities in slum areas will be less effective if projected future influxes of environmental refugees are not taken into account. And development activities in low lying coastal areas or floodplains could be wasted with significant sea level rise.

The floods in Mozambique in 2000 wiped out decades of development and investment, clearly demonstrating that any development projects which are not 'disaster proofed' could be wasted by the increasing frequencies of tropical storms and cyclones expected due to climate change. "Years of development work in Mozambique, a country still recovering from years of war, were washed away by these floods. The worst in living memory, they followed unusually heavy rains over southern Africa and tropical storms that accompanied cyclones Connie and Eline. The Mozambique Government estimated that £65.5 million would be needed for reconstruction, including for water and sanitation, food aid, medicine and healthcare, shelter and housing, seeds and tools." (Simms and Reid 2005).

AN INSTITUTIONAL FRAMEWORK TO SUPPORT ADAPTATION

The current situation with regard to providing support from the international community for adaptation in developing countries and poor communities is still in its early stages. Much learning is occurring, but some things are already clear:

- The need for international support (primarily, but not only, funding) for the most vulnerable countries and communities will be essential if those countries and communities are to be able to face the adverse impacts of climate change over the coming years and decades.

- The quantity of funding required, although figures are still only rough estimates, will be probably be in the region of a Billion of Dollars a year.

- International funding for supporting adaptation in poor developing countries is an obligation under the UNFCCC under the 'polluter pays principle'.

- New and innovative sources of raising funds using the polluter pays principle should be explored to raise the levels of funding that will be needed.

- The Adaptation Fund (under the Kyoto Protocol) may provide a mechanism for distributing adaptation funds raised from new and innovative sources.

- Mechanisms for identifying and supporting the most appropriate adaptation actions at various levels are being piloted and need to be developed and mainstreamed as soon as possible.

- The close relationship between adapting to climate change and sustainable development means that adaptation is best mainstreamed in development practice rather than developed a separate stand-alone activity (although funding should come from sources other than development assistance).

REFERENCES

Abdullah, A., B. P. Jallow and M. Reazuddin (2006) *Operationalising the Kyoto Protocol's Adaptation Fund: A New Proposal*. IIED Sustainable Development Opinion Piece. IIED, London.

Agrawala, S. (2004) Adaptation, development assistance and planning: challenges and opportunities. *IDS Bulletin Climate Change and Development* 35(3): 50-53. Institute of Development Studies, University of Sussex, Brighton.

Bals, C., I. Burton S. Butzengeiger, A. Dlugolecki, E. Gurenko, E. Hoekstra, P. Höppe, R. Kumar, J. Linnerooth-Bayer, R. Mechler, K. Warner (undated) *Insurance–related Options for Adaptation to Climate Change*. Unpublished paper written by the Munich Climate Insurance Initiative (MCII).

Breman, J. G. (2001) 'The ears of the hippopotamus: manifestations, determinants and estimates of the malaria burden.' *American Journal of Tropical Medicine and Hygiene* 64(suppl 1): 1-11.

Burton, I. (2006) 'Climate change insurance'. *Tiempo: a Bulletin on Climate and Development*. 58: 26.

Chowhan, G. and S. K. Barman (2005) *The Reducing Vulnerability to Climate Change (RVCC) Project: Reflecting on Lessons Learned*. Unpublished report, CARE Bangladesh.

Dalal-Clayton, B. (2003) "The MDGs and sustainable development: the need for a strategic approach" In D. Satterthwaite (ed.) (2003) *The Millennium Development Goals and Local Processes: Hitting the Target or Missing the Point*. IIED, London. Pp. 73-91.

DFID (2003) *Climate Change and Poverty - Key Sheets. Summary of the main issues Concerning the Interlinkages between Climate Change and Poverty Reduction.* DFID, London.

Githeko, A. K. and W. Ndegwa (2001) 'Predicting malaria epidemics in the Kenyan highlands using climate data: a tool for decision makers.' *Global Change and Human Health* 2: 54-63.

Huq, S. (2006) 'Adaptation funding'. *Tiempo: a Bulletin on Climate and Development*. 58: 20-21.

Huq, S. A. Rahman, M. Konate, Y. Sokona and H. Reid (2003) *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs)*. IIED, London.

Huq, S., H. Reid and L. A. Murray (2006) Climate Change and Development Links. *IIED Gatekeeper series* no. 123.

Klein, R. J. T. (2001) *Adaptation to Climate Change in German Official Development: An Inventory of activities and opportunities, with a special focus on Africa*. Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany.

Konate, M. and Y. Sokona (2003) *Mainstreaming Adaptation to Climate Change in Least Developed Countries. Working Paper 3: Mali Country Case Study*. IIED, London.

Lim, B. and E. Spanger-Siegfried (eds) (2005) *Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures*. UNDP-GEF. Cambridge University Press, Cambridge.

McGhie, J., K. Migiro, A. Kwatra, A. Pendleton, J. Melby, D. Nutt, S. Wilson and J. Davison. (2006) *The Climate of Poverty: Facts, Fears and Hope*. Christian Aid, London.

Morduch, J. (1999) 'The role of subsidies in microfinance: evidence from the Grameen Bank' *Journal of Development Economics* 60: 229–248.

Murray, C. and A. Lopez (1996) *The Global Burden of Disease*. Harvard University Press, Boston MA.

OECD (2003) Special Issue on Climate Change: Climate Change Policies: Recent development and long term issues. *OECD Papers* 4 (2). Organization for Economic Cooperation and Development (OECD) publications, Paris.

Osman-Elasha, B. and T. Downing (2007) *Lessons Learned in Preparing National Adaptation Programmes of Action in Eastern and Southern Africa*. Unpublished Paper, Stockholm Environment Institute.

Rahman, A. and M. Alam (2003) *Mainstreaming Adaptation to Climate Change in Least Developed Countries. Working Paper 2: Bangladesh Country Case Study*. IIED, London.

Red Cross/Red Crescent (2002) *Conference Proceedings*. International Conference on Climate Change and Disaster Preparedness. June 26-28, 2002, The Hague, The Netherlands.

Simms, A., J. Magrath and H. Reid (2004) *Up in Smoke. Threats from, and Responses to, the Impact of Global Warming on Human Development*. New Economics Foundation, London.

Simms, A. and H. Reid (2005) *Africa – Up in smoke?* The second report from the Working Group on Climate Change and Development. New Economics Foundation, London.

Sperling, F. (ed.) (2003) *Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation*. World Bank, Washington.

WHO (2004) *Climate Change and Health: Risks and Responses*. World Health Organization, Geneva.