Look Before You Leap

A Risk Management Approach for Incorporating Climate Change Adaptation in World Bank Operations

DRAFT

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Prepared for the Climate change Team (ENV)

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Executive Summary

A new international consensus has emerged on the need for adaptation to climate change. While there is widespread agreement on the need to move forward vigorously on the adaptation agenda, there is something of a quandary about how best to proceed. Hasty actions could distort the development process, and might even have perverse and unintended effects, including increases in vulnerability. While priority attention for adaptation is indeed needed, we argue that it is wise to *look before you leap*.

Adaptation is likely to be more successful to the extent that it is incorporated into the sustainable development process, and recognizes that response to current climate variability and extremes is a necessary, if not sufficient, part of an effective adaptation strategy. Moreover, adaptation is not only a matter of projects and measures but also involves the evaluation and development of policy.

Two questions emerge and are the central concern of this paper:

1. How can the legitimate concern of developing countries to reduce their vulnerability to climate change be recognized as part of regular development work, without losing its special status as a global environmental problem?
2. How can climate change adaptation be "mainstreamed" into development activities and programmes in a manner which strengthens and does not distort the development process?

A short answer to these questions is to develop a *climate risk management approach*. The main message of this paper is an elaboration of this idea, and suggestions for its further development. We suggest that climate risk assessment should become a routine component of Bank activities. This does not apply to all Bank activities, only to those where there are significant climate risks. As a first step, we thus propose a screening tool to select which projects merit further risk assessment. At the country level the risks of climate change and variability should be recognized along side other risks that are routinely assessed, such as environmental impacts, economic risks relating to fluctuations in exchange rates and commodity prices, or political risks like instability and social unrest. As such, they would be reflected in Country Assistance Strategies and sector work.

While these suggestions mostly fall within the scope of regular Bank work, their implementation could be facilitated by the emerging international regime for climate change adaptation, in particular the financing opportunities under the Climate Convention. We offer some suggestions for a harmonization of the Convention's global atmosphere perspective with the development concerns of the World Bank and its clients (the development perspective). The Bank can contribute to a further convergence of these two perspectives, which would facilitate a successful resolution of the two questions we raise about climate as a global environmental problem and the need to mainstream climate adaptation into sustainable development.

Our recommendations and suggestions for next steps can be summarized as follows:

1. The integration of adaptation to climate change into development (mainstreaming) can be achieved through the routine incorporation of climate risk management into Bank work at the country level and in the project cycle. This climate risk management should target the whole spectrum of climate change, climate variability and extremes.

2. A preliminary screening of projects for climate risk could be quick and straightforward, provided that appropriate climate risk information is made readily available. To this end, the Bank could establish a Climate Risk Management Knowledge Base (possibly extended to include all natural hazards).

3. Only for projects at risk would further risk assessments be performed. Tools for such assessments, best practice examples and access to networks of expertise and experience could also be included in the Climate Risk Management Knowledge Base.

4. At the country level, climate risks should routinely be assessed in Country Assistance Strategies and sector work, alongside other risk assessments. Again, the Country Team could draw from information and tools in the Climate Risk Management Knowledge Base.

5. The development of climate risk screenings tools and methods for risk assessment can build upon recent and current Bank work in the regions. Further development could initially take place on a pilot basis, for instance in a few "climate risk hotspot" countries and projects. These first few countries and sectors would also be a good testing ground for the development of the Climate Risk Management Knowledge Base.

6. While the development of tools and collection of information can only happen in the context of particular countries and sectors, and needs to go hand in hand with ongoing Bank work, there is a need for central support and coordination. Both the Global Climate Change Team and the Disaster Management Facility, which have successfully worked together in this area in the past few years, need to be strengthened to perform these tasks and support the Regions to improve climate risk management.

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Acronyms

AAA	Analytic and Advisory Activities
ACCC	Adapting to Climate Change in the Caribbean
ADPC	Asian Disaster Preparedness Center
AIACC	Assessments of Impacts and Adaptations to Climate Change
APF	Adaptation Policy Framework
BCAS	Bangladesh Centre for Advanced Studies
CAMP	Country Adaptation Mainstreaming Profile
CARICOM	Caribbean Community
CAS	Country Assistance Strategy.
CCCCDF	Canadian Climate Change Development Fund
CDF	Comprehensive Development Framework
CEPREDENAC	Coordination Center for the Prevention of Natural Disasters in Central America
CHARM	Comprehensive Hazard and Risk Management
CIDA	Canadian International Development Agency
CLIMAP	Climate Adaptation for the Pacific Islands
COP	Conference of the Parties
CPACC	Caribbean Planning for Adaptation to Climate Change
CPC	Climate Prediction Center (US)
CRED	Centre for Research on the Epidemiology of Disasters
DEWA	Division for Early Warning and Assessment
DMF	Disaster Management Facility
ECMWF	European Centre for Medium-range Weather forecasting
EIA	Environmental Impact Assessment
EMDAT	Emergency Events Database
ESSD	Environmentally and Socially Sustainable Development
ESW	Economic and Sector Work
ENDA	Environnement et Developpement du Tiers Monde
FAO	Food and Agriculture Organisation of the United Nations
GCCT	Global Climate Change Team
GEF	Global Environment Facility.
GRID	Global Resource Information Database
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEPS	Initial Executive Project Summary
IFC	International Finance Corporation
IFRC	International Federation of Red Cross and Red Crescent Societies
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IRI	International Research Institute for Climate Prediction
IVM	Institute for Environmental Studies, Free University Amsterdam
LDC	Least Developed Country

MACC	Mainstreaming Adaptation to Climate Change
NAPA	National Adaptation Programme of Action
NCCSAP	Netherlands Climate Change Assistance Programme
NOAA	National Oceanic and Atmospheric Administration (US)
OAS	Organization of American States
OECD	Organisation for Economic Cooperation and Development
OGP	Office of Global Programs
PAB	Project Adaptation Brief
PIK	Potsdam Institute for Climate Impacts Research
PRSP	Poverty Reduction Strategy Paper
RIVM	National Institute for Public Health and the Environment (Netherlands)
SCCF	Special Climate Change Fund
SEI	Stockholm Environment Institute
SIDS	Small Island Developing States
START	Global Change System for Analysis Research and Training
SOPAC	South Pacific Applied Geoscience Commission
TWAS	Third World Academy of Sciences
UKCIP	United Kingdom Climate Impacts Programme
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
VARG	Vulnerability and Adaptation Resource Group
WMO	World Meteorological Organization
WRI	World Resources Institute
WWF	World Wide Fund for Nature

1. Consensus and Quandary

1.1 Two Questions

A broad international consensus is building on the need to press forward more vigorously with the adaptation agenda. The conclusion of the Intergovernmental Panel on Climate Change (IPCC 2002) that climate change is now underway and is beginning to have adverse effects, has led to wider acceptance of the necessity for adaptation. The fact that the impacts of climate change are projected to become much more severe and to affect especially the poorer countries and the poorer people in those countries (ibid.) is adding a greater sense of urgency to the recognized need for action.

One of the main reasons why climate change adaptation is now attracting such attention is that is *not* solely a long-term problem. The economic losses from extreme climatic events and climate variability, as well as the numbers of people affected, are increasing at a rapid rate and constitute a growing threat to sustainable development goals and poverty reduction (e.g. IFRC 2002, Sperling ed. 2003). Expansion of human settlements into high hazard zones, substandard construction and environmental mismanagement are largely to blame (e.g. White et. al. 2001, UNISDR 2002, IFRC 2002), but increasingly the destabilization of the climate system may be a contributing factor (e.g. IPCC 2002, UNDP 2004). There is neither a scientific basis nor a humanitarian argument for separating losses from climate variability and extremes from longer term – but already ongoing – climate change. They are all part of the same problem of reconciling human development activities with environmental hazards. Recent Bank experiences and analyses on adaptation (Mathur et al. eds. 2004) refer not only to the longer term considerations of how to manage adaptation to a significantly warmer climate in 2050 and beyond, but also, and more importantly, to immediate questions of how current vulnerability to present day climate variability and extremes can be reduced, and how the associated risks can best be managed. To this end it is important to find ways to assist those most at risk and their development partners to take into account one more factor in addition to the well appreciated causes of poverty and vulnerability that are routinely addressed.

While there is recognition of the need for action, what is not so clear is *how* to move forward with adaptation. It is no exaggeration to say that the international community is in

something of a quandary, marked by lack of understanding about precisely what actions to take, and lack of consensus about how adaptation can best be carried out. In this paper some dimensions of both consensus and quandary are explored, and proposals are made about how the Bank might proceed. We pose two questions that are the focus of this paper:

1. How can the legitimate concerns of the developing countries to reduce their vulnerability to climate change be recognized as part of regular development work, without the loss of its special status as a global environmental problem?

2. How can climate change adaptation be "mainstreamed" into development activities and programmes in a manner which strengthens, and does not distort, the development process? In other words, what are the priorities, and who should be responsible for which actions and when?

Given the scientific uncertainties about the rate and distribution of climate change, greater assurance is needed that the concern about climate risks can be properly directed to those situations where climate is really important and not squandered on illusionary problems which give a false or exaggerated impression of risk. Ways must be found to focus the seemingly broad and all-encompassing agenda of adaptation. There is a need to make serious but selective assessments of risk in the context of development.

These imperatives are relevant to all donor agencies, both multilateral and bilateral, and to the recipient countries, as well as the international negotiations under the UN Framework Convention on Climate Change. For present purposes however, our focus is on the role and work of the World Bank.

1.2 The Quest for Answers: Looking Before You Leap

While there is strong evidence that climate change will severely affect poverty reduction and sustainable development, there is only limited experience on how to factor it into poverty reduction strategies, development plans and projects. In fact, for some of the most important variables it is not clear that climate projections are certain and detailed enough to allow a straightforward application in development planning or project preparation. Climate models are still getting better and better at reproducing large-scale climate trends, and confidence in their projections for global temperature rise is quite high. However, uncertainties remain, in the models themselves and in the drivers (emission scenarios). Moreover, climate models have severe limitations when it comes to generating the type of information required in development planning. For such purposes, projections would be needed at a much finer spatial resolution than what the models typically deliver (and for which they can be validated with historical data from weather stations, which tend to be sparse in developing countries). Furthermore, planners require much more than just average temperatures, they would also want to know about precipitation and winds; and rather than just the average values, about variability and extremes. As such requirements become more local, specific and detailed, the uncertainties rise. In many cases, output from climate models is fed into sectoral impact models, which in turn introduce their own

uncertainties (for an extensive discussion on probabilities in climate projections, see Dessai and Hulme 2003)[1]. There are cases where climate change can already be seen and require immediate responses – a clear example are so-called glacial lake outburst floods in high mountain areas (Agrawala et al. 2003d). In many cases however, the key message is simply that there are rising risks and rising uncertainties, which can best be reduced by better managing the current climate, including its variability and extremes. Where possible, we can try to factor in some of the trends of which we are relatively certain (such as projections for sea level rise and storm surges, average temperatures, melting permafrost and icecaps).

Given these uncertainties, we suggest that a careful and precautionary approach be adopted. In the effort to strengthen adaptive responses the development community would be well advised not to rush into a series of actions which may well prove to be of little value, or which could even have perverse and unintended effects provoking maladaptation and leading to increased vulnerability. Too rapid a leap into adaptation risks the funding of specific adaptation measures (projects) for their own sake and without integrating them into normal development processes, where the best opportunities for risk reduction are likely to be found. With the exception of some capacity building there should be no "stand alone" climate change adaptation projects. Another danger is the creation of a bias towards structural or "concrete" adaptation projects, which can be counter-productive and may also serve to increase longer-term vulnerability rather than reduce it. Indeed there is evidence of situations in which projects that are evidently sound and economically efficient on their own terms nevertheless stimulate maladaptation and growth in vulnerability[2]. For all of these reasons, it is important to *look before you leap*.

At the same time however, we do not wish to suggest that the situation warrants a complacent or a "wait and see" attitude. In many places, there is sufficient evidence of current and growing climate risks to know that rapid and substantial responses are needed now. The debate has moved on from questioning the need for adaptation to the urgent questions of *how* adaptation is to be undertaken; *where; when; by whom; and how much?* Such questions cannot be answered generically. Adaptation is largely a place-based activity, and a great deal of it can and should take place spontaneously or autonomously within those sectors and by those people, communities and enterprises most directly at risk. Adaptation also differs greatly from sector to sector in terms of the measures and policies required, technology and cost, so that broad prescriptions are inappropriate. Furthermore, the prioritization of adaptation options takes place in a national policy context, and this is perhaps the most compelling reason why a broad one-size-fits-all approach to adaptation is not helpful.

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[1] We also note that even besides all of these uncertainties, applying climate information is far from trivial, given that for many crucial parameters – such as weather extremes and seasonal precipitation - the information is by definition probabilistic. Experimental applications of seasonal climate forecasts have shown that the route from the production of such information to its application is not straightforward, and requires, among others, careful tailoring of information to local and sectoral needs, and training the interpreters as well as end users (e.g. NOAA/OGP 1999, Van Aalst et al. 2000). And in some cases, the quality of the information may simply not be good enough to act upon it.

[2] One example is the construction of seawalls, which often have negative impacts on the local environment, including loss of ecosystems and the acceleration of erosional elsewhere along the coast. Such structural measures may also conflict with traditional coping mechanisms employed by the local population, or trigger more development in high risk locations, thus inadvertantly increasing vulnerability in the longer term.

The next phase of Bank work on adaptation will inevitably be a learning phase in which a conscious attempt is made to gather experience that can help to decide more precisely where and when strong attention to climate change risks is required, when it is not, and how to manage the risks in cases where it is. This learning phase, which has already started, should be facilitated and stimulated, so that it can gain further momentum, and lessons learned should be shared and incorporated in day-to-day Bank work. This paper provides suggestions of what the next steps in that learning phase for Bank work on adaptation could be, and discusses how the Bank's activities relate to the international context of climate change adaptation.

1.3 The Structure of this Paper

We move in Section 2 to a discussion of previous and ongoing Bank work on adaptation in order to draw lessons from experience. An important conclusion is that climate change adaptation should not be dealt with in isolation, but should be mainstreamed into national development planning and into many (but not all) development projects.

In Section 3 we address ways in which mainstreaming might best be carried out at the national and project levels, and suggest how a Climate Risk Management Knowledge Base and a screening tool can be developed for routine use in Bank operations. We also propose to build experience on a pilot basis, and offer criteria for pilot selection.

Adaptation to climate change is not the concern of the Bank alone. Efforts to develop adaptation activities with international support are being made under the United Nations Framework Convention on Climate Change and its funding mechanism the Global Environment Facility (GEF). In Section 4, we turn to the wider international context and consider the Bank's work in relation to the Convention process. We suggest how the Bank's development work and perspective could be harmonized with that of the Convention, for mutual benefit. This Section is also used to raise some additional emerging issues related to adaptation.

The final section summarizes our perspective on how to move forward.

2. Progress in Adaptation: Lessons from Bank Experience

2.1 Beyond Development as Usual: the Need for a Climate Risk Management Approach

Wealthier people, more vibrant economies, and countries with better health services, higher levels of education and stronger institutional capacity are generally more resilient to weather extremes, climate variability, and climate change. In this sense, virtually all World Bank activities contribute to vulnerability reduction: more highly developed countries have *greater generic adaptive capacity*. Under the climate change agenda more *specific adaptive capacity* would also be needed, as a conscious effort to do better given the climatic circumstances. At this specific level, Bank investments themselves are generally designed in accordance with the prevailing climate: no road engineer designs a highway, no hydraulic engineer designs dams, and no agronomist suggests new cash crops, without taking into account the local climate. So even at this more specific level, the Bank is continuously addressing climate risks.

Two issues complicate this benign picture. At the project level, climate *change* is an additional factor that is seldom captured when engineers and a variety of sectoral experts and managers look at the climatic record over the past 30 or 100 years. Even if they would want to include them, projections of climate change are frequently too uncertain and not at the necessary level of detail either in terms of spatial or temporal scales or variables. Projects may therefore be designed to meet normal engineering standards, but may become quite vulnerable unless ways are found to take climate change into account.

Besides the new dimension of long-term climate *change*, an additional problem is that many projects and development plans are well in tune with the climate normals (average conditions), but tend to pay less attention to the risks associated with climate variability and extreme events (Burton and van Aalst 1999). The failure of development to incorporate such natural hazard risks is in part responsible for the rapidly rising disaster losses across the globe, with extreme events sometimes wiping out decades of development efforts (Kreimer and Arnold eds. 2000, IFRC 2002, UNISDR 2002, UNDP 2004).

From that perspective, vulnerability reduction encompasses a more fundamental challenge than what is routinely considered in the Bank project cycle. Taking into account climatic circumstances, and more particularly climate variability and extremes, requires a more integrated approach than just the proper design of separate projects. Maladaptation – policies and practices that increase vulnerability – may occur even when by current standards development is progressing well. To avoid maladaptation, vulnerability reduction works best when it is integrated in national planning, and reflected in both policies and projects. Addressed at the level of single sectoral investments important linkages may be missed. For instance, a hydraulic design for a hydropower plant may not consider the actual or potential degradation of the forests in the upper watershed above the dam site, even when that may be a major factor determining trends in runoff and sedimentation. Such concerns may be relegated to a low priority for reasons of professional bias or institutional rigidities. Where such issues are seriously addressed a response may be to modify the design of the dam, rather than to prepare an action plan to deal with the watershed degradation. And even when things are well integrated on the project level and all win-win opportunities between sectors are being identified and included, there may be policy issues that are not captured in project designs. When a hydropower plant or an irrigation scheme fully considers the possible variability in precipitation and runoff under present and future (climate change) conditions , power subsidies and water pricing may still induce the wasteful allocation of resources in a way that can become a larger threat to sustainable water use.

Unfortunately, there are such many such examples, where current government policies and measures address specific local problems while contributing to the vulnerability of the country as a whole, or of a particular region or sector. As long as development work in those areas fails to address some of those fundamental issues, or at least takes them into account in work in related areas, some of the primary vulnerabilities will remain in the system, and well-meant development work may be rendered ineffective, or even counterproductive. Examples of the way maladaptation can contribute to large development setbacks abound in the recent history of natural disasters, including extreme examples such as Hurricane Mitch in Central America. Some of these unintended adverse consequences have been described in detail elsewhere (e.g., van Aalst and Burton 2002).

At the same time it is recognized that there is no such thing as zero risk. How much adaptation (including engineering protection) can be justified under the current climate regime, and how can current and projected variability and extreme events be factored in? The general diagnosis – a need for better risk management - is relatively straightforward, where and how to start is not.

All this speaks to the need for the development and strengthening of routine climate risk management approaches in Bank work. Acknowledging the importance of these cross-cutting challenges, the World Bank is at the cutting edge in addressing vulnerability and adaptation in cooperation with its client countries.

2.2 Adaptation in Practice: Implementing Climate Risk Management

2.2.1 Climate Risk Management in the Bank's Regions[3]

The World Bank's 2000 Pacific Regional Economic Report devotes a full chapter to climate change adaptation. It is based upon detailed economic analyses of potential climate change impacts and adaptation options in two islands (one high island in Fiji, and a low lying atoll in Kiribati). Its key findings were that climate change is already affecting the Pacific islands, and that vulnerability to its impacts is on the rise, imposing major social and economic costs on these countries. The report concluded that immediate action on adaptation is required to minimize these impacts, by adopting a range of "no-regrets" adaptation options, developing a broad consultative process for implementation of adaptation, requiring adaptation screening of major development projects, and strengthening the socio-economic analysis of adaptation options.

Since the 2000 Regional Economic Report, the Pacific region has initiated a number of follow-up activities. At the regional level, the World Bank has sponsored two High-level Adaptation Consultations of Ministers and Permanent Secretaries of Finance to discuss (i) the economic implications of climate change, climate variability and sea level rise; (ii) common strategies to adddress these challenges, and (iii) mainstreaming of climate risk management in national planning (see the Nadi Communiqué, Pacific Islands Forum Secretariat 2002). Another key activity is a pilot adaptation project in Kiribati. The current Preparation Phase aims to mainstream adaptation into economic planning, and will result in a set of clear national adaptation priorities, defined in a process of national consultation with local communities. Those priorities will be the basis for the Investment Phase, which could take the form of a top-up of public expenditure, based upon the achievement of certain "adaptation benchmarks" (see World Bank 2003, Van Aalst and Bettencourt 2004).

Some of the key messages from the Pacific are (i) there is high-level interest in climate adaptation, (ii) to be most effective, adaptation must be integrated in national economic planning (iii) climate change risk management must be based upon "no-regrets" solutions, which deal with both current and future risks at once.

In the Caribbean region, the Bank has been the implementing agency for Caribbean Planning for Adaptation to Climate Change (CPACC) a regional project financed by the GEF and executed by the Organization of American States (OAS) (World Bank 1997). This project had several components aimed at vulnerability assessment, adaptation planning, and capacity building. CPACC is currently being succeeded by a follow-up GEF project, Mainstreaming Adaptation to Climate Change (MACC), which will (i) assist in mainstreaming climate change considerations into their development planning and sectoral investment projects; (ii) identify and develop appropriate technical and institutional response mechanisms for adaptation to global climate change; and (iii) support and promote regional climate change monitoring and modeling.

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[3] Several of the projects and studies described in this section were reviewed by by external experts: John Hay for the Pacific RER (Hay 2003), Alejandro Deeb (Deeb 2003) for the Caribbean, and Saleemul Huq for Bangladesh (Huq 2003). An extended summary of their findings is presented by Burton and Van Aalst (2004).

In Bangladesh, the country team undertook a major study to assess climate change impacts in this highly vulnerable country, as well as adaptation options (World Bank 2000b). It suggested that the country should develop an anticipatory long-term approach, focusing firstly on national planning agencies. It also concluded that long-term planning faces a number of challenges, including

- The need for well-defined planning structures and procedures;
- The fact that information about climate change related issues is scattered and sometimes difficult to access;
- The difficulty of establishing integrated environmental management, while the management of these resources does require integration;
- Weak physical planning capacity with respect to land use planning,;
- A strongly centralized system of planning and management, while adaptation needs mutual coordination between central and local levels of management;
- Inadequacy of traditional planning techniques, because impacts may not occur in the near future (i.e. within the next decade) and uncertainties about changes in the regional climate and the corresponding impacts are still significant.

The projects and studies in the Pacific, Caribbean and Bangladesh all show that some urgent adaptation needs can be identified, and that an important strategy to address most of the new risks is to strengthen capacity to deal with current climate-related risks. The overarching challenge is to integrate adaptation in development planning, rather than creating stand-alone adaptation projects.

An important reason why such mainstreaming is not occurring rapidly and easily is that in most developing countries, climate change issues are handled by environment ministries or meteorological services, which are generally not in a position to ensure that climate risks are taken seriously into account by other line ministries, or by the central agencies of government, especially finance and planning. Once finance ministries become convinced of the severe economic and fiscal (besides social and environmental) consequences that climate change could have (see e.g. the IMF publication Heller 2003), they are in a much better position to promote the urgent integration of climate risk management in development planning and projects. The World Bank, with its comprehensive approach to sustainable development and strong ties to its clients' finance ministries, is uniquely positioned to promote and facilitate such a process (as demonstrated in the Pacific).

2.2.2 Climate Risk Management Initiatives at the Central Level

On a more general level, attention to the vulnerability to climate variability and weather extremes has received attention in several studies and Bank reports. For instance, the 2000/2001 World Development Report highlights the lack of security to all kinds of risks, including natural hazards and (other) economic shocks, as one of the major drivers of poverty (World Bank 2001b). It also stresses the need for greater attention to the prevention of impacts rather than the traditional reliance on response (post-disaster reconstruction). Similarly, the new World Bank Environment Strategy (World Bank 2001a), and a background paper prepared under the guidance of the Global Climate Change Team (Sharma et al. 2001) highlighted vulnerability to natural hazards as a major environmental concern.

> *"Our interventions will aim to reduce this vulnerability and the cost of natural disasters by supporting upland resource management and payments for environmental services; assessing the impacts of natural disasters; improving weather forecasting and the dissemination of weather-related information; providing information to communities about the risks they face; and stabilizing hillsides and coastal zones."*.

The Global Climate Change Team highlighted the opportunities for climate risk reduction through better management of current climate variability in an analysis of the Bank's work in the context of the 97/98 El Niño (Van Aalst et al. 2000). These links between climate change and current climate-related risks have also been explored by the Disaster Management Facility (DMF). The DMF has been advocating a move away from purely responsive disaster management towards prevention of disasters by active risk reduction, integrated in reconstruction projects as well as in regular development planning. A major study of all post-disaster reconstruction projects concludes that a shift is needed, from a primarily reactive stance to natural disasters, to a more proactive approach, reducing vulnerability to natural disasters instead of only reconstructing afterwards (Gilbert and Kreimer 1999). It concludes that this proactive approach must be a part of general sustainable development, and integrated in the CAS process. However, it also notes that further research is required on best practices, as well as cost/benefits of natural hazard risk reduction strategies and measures. Some of these studies are currently underway, including a major effort to assess the economic consequences of natural disasters in three countries: Dominica, Bangladesh, and Malawi (Benson et al. 2001, Benson and Clay 2002, Clay et al. 2003).

2.3 Climate Risk Management in Regular Plans and Projects: Missing Mainstreaming

The main thrust of all of the studies, strategies, initiatives and activities in the Regions and at the central level is that vulnerability reduction is a cross-cutting issue that must be addressed in a comprehensive fashion together with other aspects of sustainable development, preferably at the level of the country dialogue instruments on the long term (CDF), medium term (PRSP) and shorter term (CAS), to be translated in further analysis in the Bank's Analytic and Advisory Activities (AAA) and projects. This will require awareness among Bank staff, capacity to assess the risks and identify and select priority responses, and building experience in implementing the outcomes of such assessments in projects and strategies.

We have assessed to what extent progress has been made in achieving such mainstreaming in the Bank's own key planning documents. A scan of a number of Country Assistance Strategies and project documents reaffirms the conclusions from Come Hell or High Water (Burton and Van Aalst 1999): climate risks have yet to receive due attention. Even in Bangladesh, just after the extensive climate change study by the Bank's own country team, the new CAS pays very little attention to those findings (although several projects and Bangladesh' new water strategy do seem to have taken some of the conclusions to heart – see also Huq 2003). In its *Development and Climate Change* Project, the Organisation for Economic Cooperation and Development came to similar conclusions: a review of development plans and projects from a number of bilateral and multilateral development agencies showed that explicit attention to climate risks, including

climate change and current variability, is often lacking in planning documents, including the World Bank's (Agrawala et al. 2000a-d).

A similar pattern arises for the Poverty Reduction Strategy Papers. Based upon a first assessment of almost all PRSPs done so far, it appears that they provide a good framework for addressing issues related to vulnerability in a comprehensive manner, but that more attention to these issues will be needed if they are to be effective. Only a few of the current PRSPs mention natural hazards as a serious concern with regard to poverty, even while almost all of those same countries have suffered at least one natural disaster in the past five years. Similarly, few of them explicitly address natural hazard risk reduction[4]. While the PRSPs themselves are the responsibility of the client countries' governments, general guidance is largely prepared by the Bank. That PRSP guidance is currently much more developed for many other areas, including some environmental issues, than for vulnerability to natural hazards. It would be worthwhile to assess the effectiveness of the current guidance in helping countries to map the role of vulnerability in poverty, and the ways to address those issues, and possibly to revise the current guidance and/or prepare additional documentation that countries can use[5].

Overall, we conclude that while many Bank analyses and activities aimed specifically at climate risk management underline the importance of mainstreaming climate risk management, there is room for improvement in the Bank's own efforts in that respect. The following section will outline some suggestions on how this could be accomplished, not as a top-down mandate to include climate risk management everywhere, but with a set of tools to direct attention where needed.

[4] Good practice examples can be found on http://www.worldbank.org/dmf/policy/prsp.htm, and in (Bojö and Reddy 2002).

[5] In particular, some elements from the GEF/UNDP Adapation Policy Framework could be of use (UNDP 2004), as well as the guidelines from the UK Climate Impacts Programme (UKCIP) (Willows and Connell eds. 2003).

3. Climate Risk Management: Knowledge Base and Screening Tool

3.1 Prioritizing Attention for Climate Risks

There is a clear case for mainstreaming climate risk management. We propose a sequential approach: planning for adaptation should begin by identifying the key points of intervention, followed by detailed risk assessments to inform development planning and operations. This would be designed to result in a suitable mix of incremental changes to regular development activities, modifications in national policies, and direct adaptation investments. In order to achieve such a balanced and well-targeted effort, adaptation should not be supply-driven or forced from top down. Instead, it has to become a normal part of regular activities, in the Bank's client countries, in the Bank's plans, and in its operations. That in turn requires higher awareness of the need for adaptation, and better tools for climate risk management.

We here propose that a set of tools be developed and presented which will help identify opportunities for climate risk reduction. These should not be seen as rigid safeguard policies, but as an opportunity and a means to improve the Bank's work by enhancing poverty reduction and increasing the rate of return of Bank investments. (Incidentally, better climate risk identification, and better climate risk management information will also make it easier to access funds for climate risk management, including the emerging climate funds under the UNFCCC).

Given that climate risks are so sector- and country- (or even location-) specific, the identification and management of climate risks has to be undertaken as an integral part of country strategic planning and project development, by country teams and task managers. The proposed tools would provide them with a quick sense of whether climate risks might be important (awareness raising), and an impression of how to start assessing and, where needed, addressing climate risks. While our risk management proposals focus on climate change and thus also on current climate variability and extremes, it could relatively easily be extended to include other natural hazards, including earthquakes, volcanoes and tsunamis. In a development context it makes sense to broaden the risk category in this way, even though it goes beyond the boundaries of the UNFCCC.

The following sections will outline some of the elements of such a set of tools for climate risk management. First (Section 3.2), we propose a Climate Risk Management Knowledge Base, as input to climate risk management at the country and project levels. Second (Section 3.3) we discuss how Country Assistance Strategies and other country-level planning documents could be improved by explicitly considering climate information. Third (Sections 3.4 and 3.5) we propose a routine project risk screening tool at the project level, and a way to identify "climate hotspots" that could serve as pilots for experience building. Section 3.6 discusses support and coordination for climate risk management in the Bank's regional operations, and lays out a climate risk management work program for the Global Climate Change Team and/or the Disaster Management Facility.

3.2 A Knowledge Base for Climate Risk Management

First of all, we propose that the Bank establish a *Climate Risk Management Knowledge Base*, which could facilitate the familiarization of task managers and country planners with present and future climate risks, provide input into the CAS, be a background for project screening, aid the design of risk management project components, as well as raise awareness about the relevance of incorporating climate risk management in Bank work. The Knowledge Base would be web-based, and consist mostly of summaries of and links to information elsewhere, presented in such a way that it can easily be applied in a sector- and location-specific context by a task manager or country team. Given that many other development agencies (as well as client country governments, companies and NGOs) face similar climate risk management challenges, the information should be freely accessible.

3.2.1 Climate Risk Information

The first element of the Knowledge Base would be basic data about the nature, magnitude and distribution of climate risks by country and sub-national units (including both climate change and current variability and extremes). This information could be structured as follows:

- Level 1: Global: at-a-glace information on vulnerabilities and changes/trends (regions and sectors)
- Level 2: Country by country (and/or regional) summaries of key information, organized for instance as general maps of vulnerabilities and changes/trends, plus lists of threatened sectors and locations/regions within the country.
- Level 3: From both global and country-level: links to more comprehensive information sources elsewhere.

Wherever possible, the Knowledge would also include information on current adaptation, including measures and policies employed, and trends in vulnerability, on a sectoral and/or locational basis. In addition, it should provide a context of socio-economic and environmental conditions, trends, and policies.

The information could be at a macro or generic level and would be taken from existing sources, including databases on natural hazards and other global statistics (see Box 3.1); policy documents such as National Communications to the UNFCCC and National Adaptation Programmes of

Action (NAPAs); local, national and international vulnerability and adaptation studies; and IPCC regional reports and supporting papers.

Box 3.1: Global data that could be used in a Climate Risk Management Knowledge Base:

CRED/OFDA International Disaster Database (http://www.cred.be/emdat)
The EMDAT database (also used in the annual World Disaster Reports by the IFRC), provides global disaster statistics, including country-level disaster profiles.

Disaster Risk Index (http://gridca.grid.unep.ch/undp/
A country-by-country tool to assess disaster risk, developed by UNEP's Global Resource Information Database (GRID) Geneva, for (UNDP 2004).

PreView (http://www.grid.unep.ch/activities/earlywarning/preview/ims/index.php)
Another tool for visualization of natural disaster data (on a more detailed level), under development by UNEP's Division for Early Warning and Assessment (DEWA) and GRID Geneva

Reliefweb (http://www.reliefweb.int)
A country-by-country database with emergency appeals, from UNOCHA (United Nations Office for the Coordination of Humanitarian Affairs)

Provention Consortium Hotspot Project
(http://www.proventionconsortium.org/projects/identification.htm)
This project aims to provide a quantitative identification of geographic areas of high global disaster risk potential. The global analysis is complemented by specific case studies, which are currently underway.

Reinsurers
An additional source of information are the disaster statistics from the large reinsurers such as
MunichRe (http://www.munichre.com)
SwissRe (http://www.swissre.com)

In addition, many databases provide data on economic and human development as well as environmental degradation, which provide important contextual information for climate risks. These include, for instance,
- World Bank development statistics: http://www.worldbank.org/data
- UNDP Human Development Index: http://www.undp.org/hdr2003/indicator/index_indicators.html
- UNEP GRID environmental databases: http://www.grid.unep.ch/data/grid/all.php
- FAO statistics: http://apps.fao.org
- … and many others.

As an add-on, the Knowledge Base could also provide links to dynamic climate information, such as climate forecasts and examples of applications, which could be applied in an operational context (see Box 3.2).

Box 3.2: Seasonal climate forecasts

In some cases, seasonal climate forecasts might also be useful inputs for development planning and project-level decision making (see van Aalst et al. 2000), and relevant links could be provided in the Knowledge Base. Examples include:
- International Research Institute for Climate Prediction (IRI): http://iri.columbia.edu
- Climate Prediction Center (CPC) (http://www.cpc.ncep.noaa.gov)
- The European Centre for Medium-range Weather Forecasting (ECMWF) (http://www.ecmwf.int)
- World Meteorological Organization (http://www.wmo.ch)

3.2.2 Guidance on Applications

The second element of the Knowledge Base would consist of guidance on how to *apply* the information, such as the country and project level risk management screenings outlined later in this section, as well as more in-depth applications. This would include

- Methodologies, guidelines and checklists for risk management,
- Good practice examples.

Given that such tools and methods vary significantly between sectors, they could be identified and assessed on a sectoral basis. For many sectors many of those methods and tools already exist, although they would need to be modified for application to climate change adaptation (e.g. Downing and Patwardhan 2004).

3.2.3 Networks of Expertise

As a third element, the Knowledge Base could provide access to networks of expertise in- and outside the Bank, at global, regional and national level (including contact information).

3.2.4 Management of the Knowledge Base

The Knowledge Base could be launched by the Global Climate Change Team, in collaboration with the DMF, but would also require inputs from and interaction with the users in the region. It would have to be updated continuously, particularly once the body of experience in Bank operations grows.

3.3 Climate Risk Management at the Country Level

In order to assess the implications of climate risks for the economic and social development challenges facing the Bank's client countries, Country Assistance Strategies (CASs) could benefit from a routine assessment of climate and climate change risks as part of the overall country background for the client's development plans. It is now common practice to consider the risks of political instability, adverse and worsening trade balances and currency fluctuations. Climate variability and change can have similar devastating effects. If these are considered at the right time and appropriate measures taken the losses can be reduced or counteracted. Such options and information should be incorporated by the Country Team responsible for the preparation of the CAS, with assistance from the Global Climate Change Team and the DMF. Eventually, this analysis could draw from and contribute to the information in the Climate Risk Management Knowledge Base.

In most cases, the climate risk assessment will simply be an additional background element for the overall country dialogue. In addition, it could be a quick reference as well as instrument for awareness raising among task managers, who could get a quick sense of potential climate risks to be taken into account in the project cycle (more extensive information could eventually be found in the Climate Risk Management Knowledge Base). In some cases, depending on the country's and the Bank's priorities, the information could also lead to the reorientation of parts of the

project portfolio, as well as new projects and Analytic and Advisory Activities (AAA) on risk management.

In a similar way, summary climate risk information in the CAS and background information in the Climate Risk Management Knowledge Base would be of use in the preparation of PRSPs, as an input to clients' short- medium- and long-term poverty reduction strategies and the Bank's role therein.

Box 3.3: An example of country- and project-level climate risk profiles: The ADB Climate Change Adaptation Program for the Pacific (CLIMAP)

CLIMAP is a 15-month Technical Assistance program, on a pilot basis, in two countries (Federated States of Micronesia and Cook Islands). The aim is to mainstream risk reduction in these two countries' planning processes, as well as in the ADB's own operations in the Pacific islands.

The program will include risk assessments at two levels, feeding into country strategy and project preparation:

(i) Country Adaptation Mainstreaming Profiles (CAMPs):
At the level of country strategy and programming, outlining vulnerability through existing ADB economic, social and environment indicators.

(ii) Project Adaptation Briefs (PABs):
At the level of project preparation, outlining the project's vulnerability based upon a categorization of climate sensitive sectors, and types of adaptation measures that may be required, leading to comparative economic analysis of adaptation options for high-risk projects. Project preparation terms of reference will be adjusted accordingly. Prepared in the very early stages of project preparation, so that outcomes can be fully integrated in project design.

In addition a rapid scoping and assessment checklist will be developed, as part of the existing checklist exercise within the Environmental Impact Assessment process.

3.4 Climate Risk Management at the Project Level

Not all development assistance projects are equally vulnerable to the impacts of climate change. For some projects, such as institution building in the human rights and education fields, climate change may be largely irrelevant or so peripheral as to be not in need of any special attention at all. Others, such as infrastructure projects in climate hazard areas, or projects that depend upon the reliability of future water supply, may be quite vulnerable indeed. In between is a wide array of potential project activities where climate change may be relevant but in ways that are not so immediately self evident.

In most cases, vulnerability to climate change will overlap with vulnerability to current climate-related risks. Hence, we propose elements of a risk management approach, which already includes many current risks and can easily be expanded to include many other elements of risks to development posed by the external environment (including, for instance, geophysical hazards). However, climate risk management goes beyond disaster risk reduction. While extreme events are an important element of climate risks, there are also threats at the low-intensity end of the spectrum, including creeping hazards such as invasive species, rising ground water salinity, or the effects of a succession of moderate events that do not register in the disaster statistics but may have great social and environmental impacts (van Aalst and Burton 2002).

A climate risk management approach requires climate risks to be taken into account from the very first stages of project development. An initial classification of projects, done at the time of project identification, could help to determine what type of attention (and hence what tools for

risk assessment) could be needed for projects entering the project cycle. This following subsections outlines such a simple routine risk screening methodology. In cases where the project is classified as "high-risk", the risk management process would continue by doing a full or partial risk assessment, which would then feed into the project design, just like all other types of information that is currently being considered.

3.4.1 A Routine Project Risk Screening Tool

In order to select where to focus attention across the entire spectrum of Bank operations, it would be helpful to routinely classify projects that enter the project cycle using an initial risk screening process. We suggest the development of a very simple approach modeled upon the widespread practice of environmental impact assessment.

It is routine for Bank projects to be assessed in terms of their potential impact upon the environment. An initial categorization determines whether a project falls in one of the following categories:

(A) Projects that may affect the environment in a major way (e.g. major infrastructure development projects), for which a full Environmental Impact Assessment (EIA) is required.
(B) Projects that are not expected to have large negative impacts on the environment, but that do affect the environment. In such cases, a partial EIA is required.
(C) Projects where no EIA is needed.

While we do not suggest a mandatory requirement, there would be merit in a similar classification of projects in terms of climate risks[6]. Hence, we propose a routine screening for climate risks, where the question concerns the extent to which the project could be affected by such risks.

Screening is carried out at the time of identification, where projects are assigned to one of three categories on the basis on the nature, magnitude and sensitivity to the climate risk issues, and are so designated in the Initial Executive Project Summary (IEPS). The proposed screening will normally be done by the Task Manager, with advice and assistance as appropriate. It should not take any special expert analysis, and only the time required to consider the information available about potential risks (ideally, in the Bank's Climate Risk Management Knowledge Base described in Section 3.2).

An essential part of the screening is to identify those project components which are *not* climate sensitive and which can therefore be prudently dropped from further consideration. For the other project components, which may be affected by climate risks, the purpose of screening is to ensure that the appropriate amount of attention can be devoted to these risks from the very outset of the project cycle. It also serves to determine the type of climate risk assessment which is needed so that those risks can be addressed effectively in project planning, design, appraisal, implementation and supervision.

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[6] A strong case can be made for integrating natural hazard risk assessments in the EIA process. While we would endorse such an approach, developing and applying safeguards policies can be a cumbersome and time-consuming process. We believe that a separate risk management tool can show immediate benefits and would not need to be implemented as an environmental safeguard right away. At some stage, particularly once the risk screening and assessment process has matured and is widely applied, the two could easily be merged.

3.4.2 Routine Risk Screening Categories

The following risk categories could be defined:

Category 1: High Risk: Full Climate Risk Assessment

This "high risk" category contains projects that may have diverse and significant relationship to climate, including

- Projects in sensitive sectors (e.g. agriculture, water; based upon country risk profile)
- Projects in hazard zones (e.g. coastal zones, steep slopes, floodplains, cities prone to heat waves; often based upon risk mapping)
- Projects related to livelihoods close to the margin of tolerance (coping range) and/or close to the economic margins of production.
- Projects with long (physical and economic) life

For Category 1 projects, a full climate risk assessment would be required.

Category 2: Partial or Moderate Risk: Selective Climate Risk Assessment

This category includes projects at moderate risk, including

- Projects which may have some specific climate vulnerabilities
- Projects which potentially increase vulnerabilities external to the project.

Examples include education and health projects that might have water requirements or include construction in climate hazard areas, or roads and other infrastructure projects that might stimulate settlement expansion in climate risk areas

For Category 2 projects, a more restricted or selective climate risk assessment than for Category 1 projects is appropriate.

There is clearly a grey are between Categories 1 and 2. The development and testing phase of the routine risk screening classification could shed light on how to formally distinguish the two.

Category 3: No/Low Risk: No Assessment Needed

This category includes projects that are not affected in any significant way by climate, and not affecting external vulnerability.

Examples include projects in human rights or good governance.

For Category 3 projects, no climate risk assessment is normally necessary.

3.4.3 Elements Considered in the Screening Process

The screening process to classify projects in any of these four categories should be very straightforward. Once routinely included in project preparation, the initial classification of a project should only require a very modest investment of a task manager's time, assuming that the proposed Climate Risk Management Knowledge Base exists, is readily accessible, and covers the project area and sector. In the more complex cases, or where information is lacking, technical assistance and advice can be provided (for instance through the Global Climate Change Team). We suggest that the screening should be based upon an evaluation of the following three elements:

Element 1: The climate risks facing the country/region
Ideally, as discussed above, some information about natural hazards facing a country would be included in the Country Assistance Strategy, so that this summary information would be readily available. In addition, the task manager should be able to draw upon a very simple country-profile of climate vulnerability, part of the Climate Risk Management Knowledge Base, which also contains links to more detailed information. If such pre-prepared information is lacking, task managers and/or other team members that have worked in a particular country before will likely have a good first sense of risks involved. Note that in most cases, vulnerability to current climate risks is a useful proxy indicator for vulnerability to climate change.

Element 2: Climate risks to the project
The extent to which the project contains components that may be vulnerable to climate risks

Element 3: External climate risks affected by the project
The extent to which the project may have consequences for the vulnerability of external natural and human systems.

In general, it is likely to be intuitively obvious whether a project could be directly affected by the climate risks facing the region/country, but less straightforward to assess effects on external risks. Some considerations for each of the four categories arise as follows

Category 1 (high risk)
Direct risk: Large components of the project are subject to the climate risks facing the country/region. Examples include infrastructure and agriculture projects located in flood- or drought-prone areas, and water management projects, particularly when there is water scarcity already or when there is a significant or unsustainable trend in the demand for or supply of water.
Effect on external risk: Project could have a strong effect on the climate risks facing the country/region. Examples infrastructure projects that trigger development in dangerous areas, even when the infrastructure itself may not be at risk.

Category 2 (moderate or partial risk):
Direct risk: Some elements of the project are subject to direct risks, but the risk to the project as a whole is limited or only indirect. Examples include education and health projects that include the construction of schools or hospitals in risky areas.
Effect on indirect or secondary risk: The project may have indirect effects on the vulnerability of the country. For instance, an agricultural market reform project that removes government subsidies on certain crops (and would be classified Category 3 in terms of climate risks to the project itself) can lead farmers to switch to crops that could make them more vulnerable to climate variability and change.

Category 3 (no or low risk):
Direct risk: Project is not sensitive to climate risks at all,
Effect on external risk: project does not (negatively) affect external vulnerability.
Examples include market reform, human rights and good governance projects (in fact, some of these projects would not even require the climate information from Element 1 and could immediately be classified in this category).

As mentioned above, given the large overlaps between vulnerability to climate change and vulnerability to current climate risks, this proposed screening process essentially captures both. Although the first trends and impacts are already with us, a general rule of thumb could be that the longer the typical lifetime of the project components and their effects, the more likely it is that climate change (or other trends) will be important.

3.4.4 Output of the Project Screening Process, with Examples

The output of the screening exercise is a classification of the project in any of the three categories. In case of *high risk* or *moderate/partial risk*, a brief description of the risks identified and terms of reference for a climate risk assessment would also be prepared.

The following are a few examples of recent or current projects and how they might be classified in a climate risk screening:

Example 1: Bangladesh – HIV/AIDS prevention project (project ID BDPE69933)
Objective: To prevent large-scale outbreak of HIV epidemic, by scaling up NGO programs and strengthening the government's capacity to respond effectively to HIV and AIDS.
Climate risk screening:
- Country extremely susceptible to climate risks; frequent floods, droughts; expected to get worse due to climate change and sea level rise. Many people at risk due to high population density (main source: World Bank climate change and sustainable development study)
- No project components directly at risk.
- No maladaptation effects on external vulnerability.
- Some indirect benefits (healthier population has higher coping capacity)

Hence, category 3: low/no risk, no risk assessment needed

Example 2: Caribbean: Mainstreaming Adaptation to Climate Change Project
Objective: To facilitate the creation of an enabling environment for climate change adaptation in Caribbean small island and coastal developing states.
Climate risk screening:
- Risk management is core goal of project.

Since it is by definition a risk management project, this project does not require a separate or additional risk assessment.

Example 3: Brazil - Natural Resources Management and Poverty Reduction Project

Objective: Reduce rural poverty, while improving natural resources management. Poor rural families' incomes and livelihoods would be improved by: (i) support for Government efforts to integrate environmental and social sustainability into development and poverty reduction strategies; (ii) enhanced local governance and community participation in decision-making; (iii) reversed land degradation and better protection of natural resources; and (iv) improvements to income-generating opportunities and living conditions for the rural poor.

Climate risk screening:

- Country susceptible to climate risks; floods, droughts, among others related to El Nino, which would also be affected by climate change.
- No direct risks to the project as a whole, but some components could require risk assessment.
- Some positive effects on external vulnerability. Explicitly incorporating climate risks could add to the benefits of the project.

Hence, category 2: - Moderate/partial risk: selective climate risk/benefit assessment proposed. Better information about risks and risk reduction options could be incorporated in the formulation of development and poverty reduction strategies, feed into local decision-making processes, and improve project components to reverse land degradation and protect natural resources.

Example 4: Lesotho – Highlands Water Project (Phase IB)

Objectives:

(a) To put in place the physical and managerial capacity for Lesotho to transform its principal natural resource of abundance - water - into export revenues that can be applied to poverty reduction and economic stability while (i) protecting the environment and mitigating any adverse social and environmental impacts and (ii) maximizing the local development spin-offs of the project in Lesotho; and

(b) To assist South Africa in developing its lowest cost alternatives for supply of water to the Gauteng Region.

Climate risk screening:

- Country is susceptible to climate risks. Erratic rainfall, poor soils, and worsening land degradation in the face of rapid population growth and big livestock herds, compounded by institutional problems. Climate change could result in higher temperatures, shifts in rainfall, possibly shorter growing seasons, heavier snowfall and extreme events (source: Lesotho National Communication to the UNFCCC)
- Many project components at high risk from climate change.
- Many project components could indirectly affect vulnerability to climate risks

Hence: category 1: High Risk: full climate risk assessment needed for entire project.

3.4.5 Climate Risk Assessments for Projects at Risk

If a project is categorized as *high risk* or *moderate/partial risk*, there would be merit in undertaking some sort of climate risk assessment. The type and depth of such a climate risk assessment will vary considerably across sectors. While many standard analytical tools are available, these would generally require some modification. For some cases, standard risk assessment tools could readily be applied to existing climate information, but in other cases either the nature of the risk or the quality of the information may warrant new approaches (for instance, in relation to climate-induced shifts in ecosystems).

A manual of methods and tools for climate risk assessment might be helpful in the future (and some of them already exist, such as UNDP 2004, Willows and Connell eds. 2003, Stratus 1999, Feenstra et al. 1998, Carter et al. 1994, and at the regional level SOPAC 2002 and ACCCC 2003). At this stage however, it is probably better to carry out a number of climate risk analyses in association with specific projects to gain a variety of practical experiences, both in the risk assessments themselves, and in incorporating their results in project design. Hence, rather than just leaping into the classification of all of the Bank's projects, we propose a pilot phase to gain experience, which could start in *climate risk hotspot*s, as discussed in the next section. As it accumulates, such know-how can be incorporated in the Climate Risk Management Knowledge Base.

3.5 Identifying Pilot Opportunities: Climate Risk Hotspots

To gain experience in climate risk management in the project cycle, the first step the Bank could take is to select some "climate risk hotspots": good opportunities for climate risk management in its current pipeline of projects in preparation; cases in which climate risk management might clearly yield high benefits in terms of project quality, efficiency and sustainability. At the same time, these projects would become the pilots that would contribute to the process of building experience and capacity in climate risk management.

Some simple criteria could be applied to identify such projects, by looking for critical sites or localities that are highly vulnerable to climate change:

1. Project sector substantially risk-affected, based on a categorization such as:
   - Climate dependent (e.g., agriculture, water) (NB include potential adaptation benefits)
   - Climate sensitive (e.g., infrastructure, health)
   - Climate connected (e.g., insurance)
   - Climate neutral or independent (e.g., good governance, human rights, but note that government stability can be affected by climate-related disasters);
2. Projects located in regions or places of known high risk from climate variability and extremes;
3. Project related to economic activities (livelihoods) that are close to the limits of tolerance or coping capacity;
4. Long lifetime of project (economic and physical life);
5. Projects which increase vulnerability.

Criteria like these could be applied to projects in the pipeline, but also to projects in the current portfolio. The initial selection could be global, or focus on particular countries or regions, and would be done in partnership between the Global Climate Change Team (and possibly the DMF), and the Region/Country Team involved.

The selected high-risk projects would be analyzed in detail by a full or partial risk assessments, which would feed into the project design. These pilots would help build experience both in terms of risk assessment methodology and in terms of integrating assessments outcomes into operational work. The hotspot projects would also provide a sense of the type of climate risk analyses that would be required at the country level to advise project identification and preparation as well as national development planning (data requirements for the Climate Risk Management Knowledge Base).

Once the tools have been tested and the usefulness of climate risk assessments has been established in a number of real projects, that experience would feed into a routine project risk management system, as outlined above.

3.6 Support and Coordination: a Climate Risk Management Work Program

While climate risk management primarily belongs in the Bank's regions, it should be facilitated by central support and coordination. These tasks could be covered jointly by the Disaster Management Facility and the Global Climate Change Team. In the past years, these two focal points have collaborated closely on climate change issues, but neither of the two currently has enough capacity, and there would be great merit in strengthening them.

Key elements of Bank-wide support and coordination would include the following elements:

Information services: the Climate Risk Management Knowledge Base (see Section 3.2):
- A database of climate risk information;
- Risk management methodologies, guidelines and checklists;
- Good practice examples of risk assessments in operational contexts; and projects, country assistance strategies and PRSPs containing risk management elements.

Some of this information is already available (for instance at the current websites of the DMF and the Global Climate Change team[7]). The best way to expand it to the full scope proposed here might be to focus initially on a few countries. As a first step, a hotspot screening (Section 3.5) could identify good opportunities for pilots in risk assessment and incorporation in current operations. The countries containing these hotspots would be the first for which the Knowledge Base would be compiled, where that information would feed into the CAS, experience could be built on incorporating risk management in a few ongoing and upcoming projects, and where methodologies for routine risk screening could be tested. The experience gained in that process could be used to refine the methodologies and tools. Depending on the final shape of the tools and their adoption, some capacity for climate risk management could eventually be established at the regional level, with the Global Climate Change Team and the Disaster Management Facility acting as focal points for cross-regional sharing of experience and liaising with the global policy arena and funding mechanisms.

Practical assistance could consist of
- Technical cross-support to help out with risk assessments and risk management project components, to apply analytical risk assessment tools and translate their outcomes to operational applications;
- A database of experts.

[7] See http://www.worldbank.org/dmf, and http://www.worldbank.org/climatechange.

Exchange of experience within the Bank could be facilitated by

- Seminars and trainings;
- Lists of current and past projects with names of task managers who can be contacted;
- E-mail distribution lists to exchange information (probably on a region-by-region and or sector-by-sector basis).

Furthermore, it would be useful if some central capacity would be available for:

Assistance in the mobilization of adaptation funding, which could include

- Practical advice and assistance in project design in the light of the – often complicated – funding criteria applied by GEF and other adaptation sources;
- Help in approaching GEF, bilateral donors and possibly even foundations and companies to attract adaptation grant financing.

Research and Development

Research and analysis on climate risk management, and development of climate risk management applications, in close coordination with ongoing Bank operations. These efforts should have two key aims:

(i) Keeping track of the international state-of-the-art in science, technology and policy on climate risk management and making it available for operational applications

(ii) Inciting and performing original research and development in areas within the Bank's core mandate: the relationships between climate risk management and poverty reduction, and the economics of climate risk management.

Liaise with other actors in the international climate change arena.

Finally, keeping in mind its comparative advantages, the Bank can play a leadership role in organizing and sharing experience between various development agencies (e.g. through the Vulnerability and Adaptation Resource Group).

4. The International Context

4.1 The Growing International Momentum for Adaptation

As previously noted the growing attention to adaptation is not peculiar to the World Bank, and is to be seen in the work of other donor agencies as well as the climate change negotiations under the Framework Convention. In its Third Assessment Report, the Intergovernmental Panel on Climate Change (IPCC 2002) reaffirmed the tentative conclusions of its previous reports: anthropogenic climate change is already happening and is set to intensify even if the planned reduction in greenhouse gas emissions is achieved on schedule. The strategy to deal with climate change must include both adaptation and mitigation (see Box 4.1).

Box 4.1: Some key conclusions of the IPCC Third Assessment Report (IPCC 2002)

"There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities"

"The impacts of climate change will fall disproportionately upon developing countries and the poor persons within all countries, and thereby exacerbate inequities in health status and access to adequate food, clean water, and other resources"

"Reduction of greenhouse gas emissions, even stabilization of their concentrations in the atmosphere at a low level, will neither altogether prevent climate change or sea-level rise nor altogether prevent their impacts. "

"Adaptation is a necessary strategy at all scales to complement climate change mitigation efforts."[..]

"Adaptation has the potential to reduce adverse effects of climate change and can often produce immediate ancillary benefits, but will not prevent all damages"

The new findings of the IPCC have strengthened concern in developed and developing countries alike. In particular, the potential implications for sustainable development and equity are serious. In a paper on *Poverty and Climate Change* (see Box 4.2) a consortium of bilateral and multilateral development agencies (including the World Bank) has noted that climate change poses serious threats to the accomplishment of the Millennium Goals. Major bilateral donors have been reexamining their policies and portfolios to see how they can best respond to the need for

adaptation, and reformulating their own programmes for climate change. In addition, a number of new players have been attracted to the table, resulting in initiatives by the Red Cross/Red Crescent movement, IUCN, the Stockholm Environment Institute, the International Institute for Sustainable Development, the International Institute for Environment and Development and other NGOs (see Box 4.3 and 4.4).

Box 4.2: Interagency Paper on Poverty and Climate Change (Sperling, ed. 2003)

Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation was written by ten multilateral and bilateral development agencies and Banks:

- African Development Bank
- Asian Development Bank
- BMZ (Germany)
- DFID (UK)
- DGIS (Netherlands)
- European Commission
- Organization for Economic Cooperation and Development (OECD)
- United Nations Development Programme (UNDP)
- United Nations Environment Programme (UNEP)
- World Bank

The paper puts the climate change adaptation debate solidly in a poverty context. Its key conclusions:
(i) Climate change is happening and will increasingly affect the poor
(ii) Adaptation is necessary and there is a need to integrate responses to climate change and adaptation measures into strategies for poverty reduction to ensure sustainable development.

Box 4.3: Some of the ongoing non-governmental initiatives on climate change adaptation

IFRC (Red Cross) Climate Centre:
http://www.climatecentre.org
IISD/IUCN/SEI Climate Change, Vulnerable Communities and Adaptation
http://www.iisd.org/natres/security/ccvca.asp
IUCN Climate Change Initiative:
http://www.iucn.org/themes/climate/
WWF Climate Change Programme
http://www.panda.org/about_wwf/what_we_do/climate_change/what_we_do/impacts_adaptations/index.cfm
IIED Climate Change Programme:
http://www.iied.org/climate_change/index.html

Box 4.4: Other ongoing projects on planning for climate change adaptation

AIACC (http://.aiaccproject.org)
Assessments of Impacts and Adaptations to Climate Change; global initiative developed in collaboration with the IPCC, funded by the GEF (and several others), implemented by UNEP, executed by START and Third World Academy of Sciences (TWAS).
DevelopmentFirst (http://.developmentfirst.org)
Cooperation between research institutes across the globe, including many in developing countries (e.g. BCAS and ENDA), coordinated by UNEP Risoe, RIVM and IIED, to study linkages between climate and development policy
OECD Development and Climate Change Project (http://.oecd.org)
Six case studies on links between climate change vulnerability and adaptation and development planning
CCCFD Canadian Climate Change Development Fund (http://www.acdi-cida.gc.ca/climatechange)
Several pilot on adaptation.
NCCSAP-II (http://.nccsap.net)
Netherlands Climate Change Studies Assistance Programme, Phase II

At the same time, the attention to adaptation in the United Nations Framework Convention on Climate Change (UNFCCC) has grown steadily since the 6th Conference of the Parties (COP 6, The Hague 2000 and Bonn 2001). COP 7 (Marrakesh 2001) saw the establishment of several funds that can be used to support adaptation activities (see Box 4.5). The move towards adaptation was further reinforced in the Delhi Declaration at COP 8 (November 2002). The Global Environment Facility, the financial mechanism for the UNFCCC, has also been reformulating its approach to adaptation to climate change, as a growing element embedded in its work[8]. Adaptation is seen a cross-cutting them that applies in all its main are as of activity including especially biodiversity, drylands management, and water resources.

The GEF's implementing agencies (initially UNEP, UNDP and the World Bank) have been assisting their clients in accessing GEF funding for adaptation, primarily for studies and capacity building. Awareness is rising that adaptation will soon need to go beyond that stage, as exemplified by initiatives like the National Adaptation Plans of Action (NAPAs), and the UNDP/GEF Adaptation Policy Framework (UNDP 2004).

Box 4.5: The global funds for adaptation

As part of the Marrakesh Accords (UNFCCC 2001), the UNFCCC created three new funds for adaptation (in addition to the possibilities for adaptation-related funding under the GEF Trust Fund):

(i) The Special Climate Change Fund (SCCF), which relies on voluntary contributions is designed to support a wide range of activities including adaptation. Initial guidance was adopted at COP9.

(ii) The Adaptation Fund is specifically earmarked for adaptation but what sort of activities are to be eligible has not yet been determined. The Fund will come into being in accordance with Article 12.8 of the Kyoto Protocol and is to be financed primarily by a levy imposed on the transactions under the Clean Development Mechanism. The operation of this Fund depends upon the ratification and implementation of the Kyoto Protocol and the amount of emissions trading which takes place (or potential voluntary contributions). The principles upon which this Fund will operate remain to be worked out.

(iii) The establishment of the Least Developed Countries Fund (LDC fund) recognizes that there are some cases in which the need for adaptation is urgent and can be justified now. In order to assist the Least Developed Countries in identifying and prioritizing these cases the LDC Fund will finance the preparation of National Adaptation Programmes of Action (NAPAs) which "*will serve as simplified and direct channels of communication for information relating to the urgent and immediate adaptation needs of the LDCs".* (Decision 28/CP7 paragraph 5 of the Annex). Paragraph 2 of the Annex states: "*The rationale for developing NAPAs rests on the low adaptive capacity of the LDCs which renders them in need of immediate and urgent support to start adapting to current and projected adverse effects of climate change. Activities proposed through NAPAs would be those whose further delay could increase vulnerability or lead to increased costs at a later stage".*

(iv) In addition, a new Strategic Priority has been established in the GEF Trust Fund which will facilitate adaptation pilots, as an integrating mechanism across the Rio conventions (GEF Business Plan FY05-07, document GEF/C.22/6).

The growing momentum for adaptation has created a rich array of possibilities. There is (or soon will be) a diversity of sources of funding for adaptation and a diversity of approaches and rules adopted by different agencies and governments. While a period of experimentation can be justified as a necessary step in accumulating experience in how to manage adaptation, there is a growing danger that the efforts will lack sufficient coherence. A disorganized and chaotic pattern

[8] See "A proposed GEF approach to adaptation to climate change", GEF/C.21/Inf.10 (GEF 2003).

of response can result in confusion and ultimately a loss of the opportunities which presently exist to develop a sound adaptation approach.

This situation has led some to call for a more integrated and uniform approach to adaptation within the UNFCCC. Sometimes this is referred to as the „Adaptation Protocol“, or the need for a „new legal instrument“. Such issues are matters for continuing negotiations among the Parties to the convention. As far as the World Bank is concerned it is sufficient to note that there are new possibilities to link Bank activities in risk management with additional financing from the UNFCC process, as a means of taking the increased risks from climate change into account. The nature of these opportunities is likely to change as the Convention funds evolve, and it will therefore be necessary for the Bank to remain engaged and to use the opportunities as they arise.

4.2 Two Adaptation Perspectives

From the perspective of the Bank's task managers and clients the picture is complicated by the need to harmonize the management of adaptation as it proceeds along two interrelated but separate and sometimes even conflicting tracks:

1) The process of enabling and facilitating adaptation under the United Nations Framework Convention on Climate Change, (UNFCCC) and its financial mechanism the Global Environment Facility (GEF);

2) The mainstreaming of climate change adaptation into normal development planning and projects, including the work of the World Bank.

4.2.1 The Convention Perspective on Adaptation

The first perspective to emerge in time is well captured in the approach of the UN Framework Convention on Climate Change. It might be called the *Convention Perspective* or the *Global Climate Change Impacts and Response Perspective*. It has come to acquire the following characteristics:

- It is about climate *change* and not about the normal (current) climate and its variability. The rationale for the Convention is that there is a global environment issue that cannot be managed nationally. This is to be separated from normal development problems, including current climate risks, and normal development assistance.
- Because of its traditional emphasis on mitigation, it is concerned with the establishment of *global environmental benefits*. The more spatially limited benefits that accrue to a country or a locality do not fall under the Convention, although the Convention does recognize the importance of adaptation.
- It is limited to the *incremental costs* of adaptation associated with climate change and not the costs and benefits of adaptation to normal climate.
- It has a top-down perspective on impacts and risks: assessments are driven by climate change scenarios extended well into the future; the impacts that follow from these scenarios; and lastly adaptation to those future impacts.

- Adaptation is thought of mainly in terms of measures, not policy (for which it is most difficult to separate normal climate and climate change).
- It seeks a comprehensive approach in which adaptation is integrated into mitigation. A key question is „By how much can the costs of climate change impacts be reduced by adaptation?“
- It is part of a globally negotiated management process.

Although these characteristics now dominate the Convention perspective this was not the case at the time when the Convention was being negotiated in 1989-92. Recall that the Convention was among the agreements signed at the Rio de Janeiro 1992 United Nations Conference on Environment and Development, the so-called Earth Summit. The fundamental purpose of the Convention was to find ways of dealing with climate change in a development context. Thus Article 2 states that:

> *"The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."*

Further, the notion of adaptation is given considerable weight in the text of the Convention. The emphasis on mitigation and the comparative neglect of adaptation came about partly as a result of the success of the previously negotiated Vienna Convention for the Protection of the Ozone Layer (1985) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1987). Thus the notion of climate change as primarily a pollution problem to be dealt with by emissions control came to dominate negotiations almost to the exclusion of adaptation. Indeed those who pointed to the need for adaptation were often castigated as being „soft on mitigation“ or worse still, attempting to deny the significance of the problem altogether.

The slow realization of the importance of adaptation can also be seen in the reasons for the creation and evolution of the Global Environment Facility as the funding mechanism. The three so-called Rio Conventions on climate change, desertification, and biodiversity all dealt with environmental issues considered to fall into the general category of „global“. As such the participation of the developing countries on these matter of global concern was agreed on the basis that they would not be expected to bear additional costs. Thus a category of *enabling activities* was created. These activities were those that enabled the developing countries to participate in the Conventions at no extra cost to themselves. This includes preparing national communications required under the Convention. It did not and does not apply to specific measures or project activities taken under the Convention such as the mitigation of greenhouse gas emissions or adaptation. These are only admitted to the financing windows when they can be shown to have or are assumed to have *global environmental benefits*. By this criterion the reduction of emissions is considered to yield global benefits to the extent that it reduces greenhouse gas concentrations in the global atmosphere. On the other hand the benefits of adaptation are assumed to be mainly local and to fall to those who do the adapting, and to the

places and countries where they live. While there may be global benefits to adaptation (e.g. the reduction or prevention of the process of creating environmental refugees, or the alleviation of poverty), these are not *environmental* benefits.

4.2.2 The Development Perspective on Adaptation

The dominance of the Convention Perspective has resulted in the slow emergence of the development perspective as previously noted. Now it is recognized that adaptation to climate change is also is part of the development process and should not be isolated from it. This is not in conflict with the spirit or the formal text of the Convention, but with the way it has been interpreted and addressed for most of the decade since it was first signed at Rio de Janeiro. Recent Conferences of the Parties to the Convention (in particular Delhi 2002 and Milan 2003) have witnessed some efforts to break away from the strict interpretations of adaptation according to the Convention Perspective, and move towards some of the elements of a *Development Perspective (or Sustainable Development and Climate Risk Perspective)* which has the following characteristics:

- It is concerned with present climate variability and extremes as well as longer-term changes in climate means.
- It accepts all sustainable development benefits no matter where they fall (not only the global ones).
- It makes no distinction about costs or "who pays". The costs of a project are the total costs (although there is room to negotiate shared cost arrangements between the GEF – or the climate funds – and other sources of financing).
- It is vulnerability- and poverty-driven, and adaptation options are assessed in those terms.
- The adaptation process is country-driven and is based upon local needs and national priorities.

4.3 Harmonizing the Perspectives: Some Issues for Attention

The initial dominance of the Convention Perspective may be one reason why Task Managers at the Bank and perhaps in bilateral development assistance agencies are sometimes hesitant about embracing the notion of climate change adaptation as enthusiastically or as urgently as we would suggest. While the potential for grant funding could be attractive for Bank clients, the concept of climate *change* by itself, and the focus on stand-alone climate *change* adaptation has caused skepticism and fostered the conclusion that climate change is a long-term problem that has no priority in current development work. There is a legitimate fear that by pursuing UNFCCC-related funding and thus following its strict guidelines, significant amounts of staff time and financial resources may be allocated to climate change adaptation in a way that serves to distort the development process by assigning a higher priority to climate risks than is justified in relation to other pressing needs.

At the same time, there is real urgency to improve climate risk management, simply from the perspective of the Bank's core mandate of poverty reduction, which risks being compromised by

the severe impacts of climate change and is increasingly at risk from climate variability and extremes. Hence, we take the view that the Bank should not neglect adaptation but that it should look at climate change as a component of integrated risk management within the Development Perspective. It is this foundation that has inspired the Bank activities and analyses reported in *An Adaptation Mosaic*, and we strongly suggest that this focus should also guide the Bank's future efforts on adaptation.

Nevertheless, UNFCCC-based grant-funding for adaptation can be a useful addition to Bank investments in climate-sensitive areas. Moreover, many of the Bank's clients who are most in need of investments in adaptation currently refuse loans for such activities, and argue they are entitled to grants as compensation for the problems (climate change) imposed upon them by others (the industrial countries responsible for most of the historical greenhouse gas emissions). The Convention is the right forum to debate such compensation, and serves to keep the pressure on the donor countries to provide additional financing for adaptation. It is also important to note that international adaptation policy making, including in the Convention, appears to be moving more in the direction of the Development Perspective. There is a bit of a quandary about how to craft the financing rules for such an integrated approach while retaining a the notions of incremental cost and global environmental benefits (and the compensation-driven pressure on financing), but there is growing consensus that adaptation should be mainstreamed, poverty-driven, and bottom-up. In short, there appears to be room for a harmonization of the Bank's development-driven adaptation agenda and the traditional Convention Perspective on adaptation.

Hence, while the Bank should base its adaptation activities primarily on the Development Perspective, it should not ignore the Convention. Accordingly, while this paper principally discusses adaptation from the development perspective, we suggest that the Bank should use its good offices to help facilitate the integration and harmonization of the Convention and the Development perspectives. This requires the Bank, and other development agencies, to increase their sensitivity to climate variability, extremes and change, and to find ways of incorporating climate risks into development practice at country and project levels on a routine basis. We have suggested approaches to this in Section 3 above. It also requires Parties to the Convention to find ways to finance such integrated risk reduction efforts, given that they are often the most effective and efficient way to reduce the problem imposed on developing countries by emissions which largely originate in industrial countries.

The following subsections discuss a number of real and perceived choices in defining an adaptation approach. In several cases, they highlight areas for possible cooperation between current UNFCCC positions and the Bank's mission, and provide suggestions for harmonization as well as strategic lessons for the Bank.

4.3.1 Measures versus Policy

In considering adaptation, many countries have given a great deal of attention to the identification of possible adaptation *measures*. First National Communications to the Climate Convention and many independent climate studies list possible adaptation measures, but make no effort to show how they relate to existing *policy*. In many instances it seems likely that policies are in place that discourage sound adaptation or serve to increase vulnerability. There may be several reasons for this focus on measures, including the expectation that stand-alone measures could more easily be funded from upcoming adaptation funds, and the complexities of addressing policy issues (in terms of both analysis and political process).

There are without question a number of instances in which the choice of adaptation measures is virtually self-evident, and these should be supported without delay. However, in the overwhelming majority of cases, the selection and design of effective adaptation strategies and measures depends upon the policy context.

The World Bank is in a strong position to facilitate consideration of the policy aspects of climate change adaptation. In its dialogue with national governments, especially the central agencies of finance and planning, as well as in its own Country Assistance Strategy and Poverty Reduction Strategy Papers, the Bank can direct attention to the need for policy reform to facilitate the management of climate risks and the use of climate opportunities. It is suggested that this would be part of a Bank approach as outlined in Section 3.

4.3.2 Integrated or Stand Alone Policies?

The discussions of adaptation policy at UNFCCC meetings and elsewhere have led many to believe that it is possible and desirable to develop *national adaptation policies*. The creation of the LDC Fund and the ongoing process to prepare National Adaptation Plans of Action (NAPAs) is a prominent example of this line of thinking. However, with very few exceptions it is not possible to identify adaptation policies and measures that address climate change alone and across the board in multiple sectors. National adaptation policies can best be formulated as part and parcel of broader policies for development including in non-climate domains.[9] It is not clear at this point to what extent the NAPAs will be concerned with policy as well as measures but the indications are that the primary focus will be on measures. Where Bank and client work is sufficiently far advanced it may be possible to provide assistance to the NAPA work in its policy dimensions. In any case the Bank can use facilitate the closer integration of adaptation measures into development policies.

[9] Note that it can very well be useful to have a separate process to identify climate risks, raise awareness, analyze existing policies, and identify and prioritize potential adaptation measures. However, such a process should result in outcomes being integrated in regular processes, including national and sectoral development strategies, budgets, policies and regulations, projects, and activities in civil society.

4.3.3 Climate Change and/or Climate Variability and Extremes?

The evolution of climate change as one of a class of global environmental issues has led some to propose that climate change should be addressed on its own without reference to the other dimensions of our climate, including current climate variability and weather extremes. From a development perspective, it makes little sense to formulate plans to adapt to climate change without addressing current climate risks at the same time. Moreover, the uncertainties in climate projections are such that the relatively small projects intended to address only climate *change* does not do justice to the high anticipated climate impacts – despite, or through, all their risks and uncertainties.

In the Convention context donor countries are of the view that climate change funds may only fund measures intended to address climate *change* . This implies that only adaptation costs to address the incremental costs of climate change would be eligible for financing under the Convention. This approach might exclude some of the most efficient and effective adaptation strategies, and make simple "no-regrets" adaptation less attractive. In addition, it could introduce a bias towards structural adaptation measures rather than policy changes and non-structural measures, for which incremental cost calculations would be much more difficult. There is an opportunity for the Bank and its clients to encourage the integration of adaptation into development policies by finding means to blend funding sources including for example the use of GEF/UNFCCC adaptation funds as an additional increment on top of World Bank loans.

In the light of its mission to fight global poverty (regardless of the origin of the challenges it faces), the World Bank is in a position to firmly choose a policy-oriented and no-regrets approach to adaptation.

4.3.4 Full versus Incremental Costs: a Funding Formula

In the light of the suggestion to regard adaptation as part of integrated risk management, and for shared-cost funding, the question remains to what extent the costs of adaptation should be covered by grants from the funds administered by GEF and other granting programmes, and how much should be in regular development loans or public expenditure in the countries themselves.

In some instances, there is a case to be made for something close to full cost funding. Such cases are likely to be found in low income developing countries where there is an obviously urgent situation and where the total project size is relatively low. Agreed full cost funding also applies now in the case of capacity building measures and analysis under Convention (GEF) trust funds.

More generally, a better case for adaptation funding can be made on a shared cost basis. Many useful adaptation measures might entail little more than a small “add-on” to existing activities. Moreover, even projects aimed entirely at climate risk management also address current climate risks, and thus generate immediate benefits irrespective of climate change. In such cases, and particularly in more developed countries, adaptation funds would only cover a small part of the total project cost.

It is widely acknowledged that the scientific basis is lacking for the confident estimation of incremental climate change costs and benefits associated with adaptation projects (or project components). Scenario-based estimates of the frequency, magnitude and distribution of climate

related extreme events are either not available or are highly uncertain and seem likely to remain so. An alternative would be to create a negotiated cost-sharing formula, with a fixed range percentages of adaptation financing for certain categories of activities and countries. Note that the share of the project that is not funded out of adaptation financing could be funded from the regular public expenditure of developing countries, IDA/IBRD, or other development funds.

The Bank could explore such cost-sharing arrangements with its clients. As long as international adaptation funding for adaptation projects is limited, the Bank could cooperate with bilateral donors that are interested in experiments on adaptation. The following table is suggestive of the type of formula arrangements that could be considered. Precise categories and ranges of funding would be the subject of negotiation and fine-tuning as in all development assistance projects.

Parties to the UNFCCC	**Cost and/or Type of Project**		
	Analysis, Capacity Building	**Non-structural Adaptations**	**Adaptation in Infrastructure, Public works**
LDCs	High	High	High-Medium
Other Low Income and/or Highly Vulnerable Countries (e.g. SIDS)	High-Medium	High-Medium	Medium
Other Non-Annex-1 Parties	Medium	Medium	Medium-Low
Higher income developing countries.	Medium	Medium-Low	Low

Table 4.1: A Suggested Cost Sharing Formula.
(High could be 90-100%; Medium 30-90%; Low 10-30%)

4.3.5 National versus Global Benefits

In the UNFCCC, there has been some reluctance in the past to support adaptation projects as part of the global financial response because the benefits of adaptation are seen to fall locally. However, developing countries see adaptation financing as largely the responsibility of the donor countries under the principle of „common but differentiated responsibilities“ as agreed in the text of the Convention.

While there seems to be no acceptable rationale for removing the global environmental benefit requirement from the financial mechanism of the Convention (GEF), there are substantial opportunities for blending Convention funds with other development assistance where such limitations do not apply. In addition other mechanisms such as climate insurance could be created or enhanced and this is currently under review.

4.3.6 National Versus Local Challenges and Responses

The fact that international adaptation financing is likely to flow primarily through national governments might create a bias towards projects and analyses at the national level. However, as with other development issues, much of the actual adaptation must take place in civil society, the private sector, and in local communities. Adaptation responses should recognize these dimensions, and invite other actors to take part in adaptation, both in the analysis of climate risks and response needs, and in prioritizing, planning and implementing responses.

The World Bank also works primarily with governments, but has ample experience in attracting key stakeholders to the table in designing and preparing development projects. In these case of climate adaptation this experience could be further elaborated as drawn upon in the project cycle[10].

4.4 Towards a Unified Regime for Adaptation: the Role of the World Bank

The considerations raised in the previous section suggest some of the elements that should be included in a more coherent international regime for adaptation. As noted above the task of incorporating climate change adaptation into development plans and activities can best be formulated as a risk management strategy. Such a strategy can be developed both at the national level (Country Assistance Strategies) and in the project cycle. This approach can be greatly strengthened by considering together both current risks from climate variability and extremes as well as longer-term climate change. There is ample opportunity for this within current Bank practice (see Section 3).

There is a growing number of possible ways in which adaptation might be supported. In addition to the new funds under the Climate Convention and the adaptation levy under the Kyoto Protocol, many donor agencies, both bilateral and multilateral are now developing there own programmes and mechanisms for adaptation assistance. A rather chaotic system appears to be growing up in which many diverse activities may be labeled as adaptation, and where there may be many funding mechanisms each with their own rules and priorities. Such a pattern seems destined to lead to an ineffective use of resources at least, and could lead to a serious misallocation of resources. This situation calls for immediate steps towards the creation of a unified and coherent regime for adaptation. This is not a responsibility of the World Bank, but it is clearly a place where the Bank could play leadership role, and where the use of its good offices would be welcomed. In the absence of such an initiative there are few signs that the other key players in adaptation are likely to be able to avert the adverse consequences of the lack of a more unified and coherent regime for adaptation.

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[10] The Bank's Kiribati Adaptation Project is an excellent example (see World Bank 2003 or Van Aalst and Bettencourt 2004).

While a coherent regime for adaptation in this strict sense may seem ambitious, there other challenges which could be combined into such an initiative.

4.5 Other Emerging Issues

There are three additional issues that seem likely to emerge into greater prominence in the next few years, and which could be linked with adaptation. It would be helpful if these could be given further anticipatory attention by the World Bank.

4.5.1 Insurance

There is a growing interest in the potential of public involvement and public-private partnerships in insurance. There is already some preliminary Bank work in this area. An example is the earthquake catastrophic loss pool established by the Government of Turkey with Bank assistance. (Gurenko in Mathur et. al. eds. 2004). There have also been unsuccessful experiments in the private sector with Catastrophic Loss Bonds and weather derivatives (Labatt and White 2002). These and other initiatives have mostly sprung from the natural disaster area and have yet to be examined in terms of their relevance for climate change. (Burton and Yohe 2003). The link between climate change and extreme weather events is such that more attention to insurance in the climate arena seems an obvious and unavoidable opportunity. For the World Bank it could be interesting to explore this angle in the context of its work on risk transfer and risk pooling, including the work in Turkey and elsewhere.

4.5.2 Adaptation and Mitigation

A second issue concerns the allocation of adaptation work within the UNFCCC context. There is much current discussion about a closer integration between mitigation and adaptation, apparently on the assumption that this would result in important synergies and facilitate work in both response categories. At one extreme adaptation could be largely absorbed within the existing mitigation regime. It might then become as much, or even more, a Kyoto Protocol activity than a Convention activity. At the other extreme there is clearly an opportunity to create a parallel adaptation regime by the negotiation of an Adaptation Protocol which has recently been suggested by the Government of China. The content of this paper makes it abundantly clear why some sort of new adaptation initiative is needed and also why it is not likely to be quickly achieved. It is perhaps too soon to speak of an emerging adaptation regime, when the character and direction of the regime remains so unclear. There are implications for the World Bank in the current discussion about the closer integration of mitigation and adaptation. The Bank's climate change work has mirrored the global pattern of giving overwhelming attention to mitigation, and of addressing adaptation as a separate and very much lesser concern. It is appropriate therefore to address the convergence question in the context of the Bank's future programming.

The world of adaptation remains fragmented and diverse, and in the absence of some courageous new initiative seems likely to remain so. The challenge for the Bank is to steer a course of

cooperation with the international climate regime under the Framework Convention, without being distracted from its own development and poverty agenda.

4.5.3 Support for Policy-oriented Climate Research

Finally, there is a need to find ways of supporting climate research in developing countries especially in the areas of vulnerability and adaptation, in a more effective manner. Capacity building for scientific understanding, climate risk management, and inputs to the policy process in developing countries has been an erratic on-off affair. Major projects and programmes have been established and then the capacity generated has been dissipated or even lost entirely at the conclusion of the project. A current example is the excellent work being carried out in the AIACC project, organized and supported through the GEF-UNEP-START-TWAS collaboration. This project has attracted additional funding from USAID, USEPA, and CIDA. It would be unfortunate if this initiative were allowed to die at the end of one project cycle as have so many others before it. An important reason for such research is that there is little source material from the developing country adaptation community upon which the IPCC can draw. The AIACC project makes a small and useful step in this direction, but it proves the rule that there is no consistent support in this area.

5. Next Steps: Looking and Acting

This report provides the components of an incremental approach that can be followed by the Bank and its client countries to gain practical experience in the incorporation of climate change adaptation into regular development assistance. The approach involves close work with client governments at both the national policy and development strategy level as well as in the project cycle. While a cautious approach is wise in order to avoid the potential mistakes of inadvertently facilitating maladaptation and a concentration on isolated stand-alone structural adaptation measures, it is also clear that there are opportunities to serve clients in helping to better manage climate risks including the risks from current variability and extremes. To this end a set of risk screening tools has been proposed which can be used to help focus and direct the next phase of adaptation work (Section 3). In addition, we have made some suggestions on how adaptation funding opportunities related to the UN Framework Convention could be optimally directed towards adaptation as an integral part of poverty reduction and sustainable development (Section 4).

Our suggestions for enhanced climate risk management in Bank work at the country and project level are based upon two assumptions about the relationship of climate change and development. First there are opportunities to increase the benefits of development activities by taking climate change, variability, and extreme events fully into account. Not to do so may deprive clients of new ways of strengthening the development process. Second there are dangers both to specific projects and to the broader development strategy if climate risks are not adequately taken into account. Just how big and important these benefits and risks are varies greatly from country to country, place to place, and project to project. Where the greatest vulnerabilities lie is not immediately obvious, but the screening required to identify priority concerns is neither complicated nor time consuming. We do not suggest that draconian steps are required to impose these concerns on Bank teams and Task Managers. The need as we see it is primarily to increase the awareness of the risks of climate change and to give practitioners in the development process the tools they need to do the job.

It is difficult to anticipate how widely these ideas can be accepted and how quickly they are likely to be adopted into routine practice. The incorporation of climate risk assessment and management into Bank operations requires something of a change, albeit a modest change, in the institutional culture. Classically changing the culture of a strong and well established institution like the World Bank is considered to be a long drawn out process. On the other hand it is highly encouraging to observe the extraordinarily rapid increase in concern for all aspects of the climate change issue, and especially in the past few years for adaptation. It is comforting to be able to feel that one is swimming with the tide and that therefore the prospects for further progress in the direction of better adaptation to climate change are bright.

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