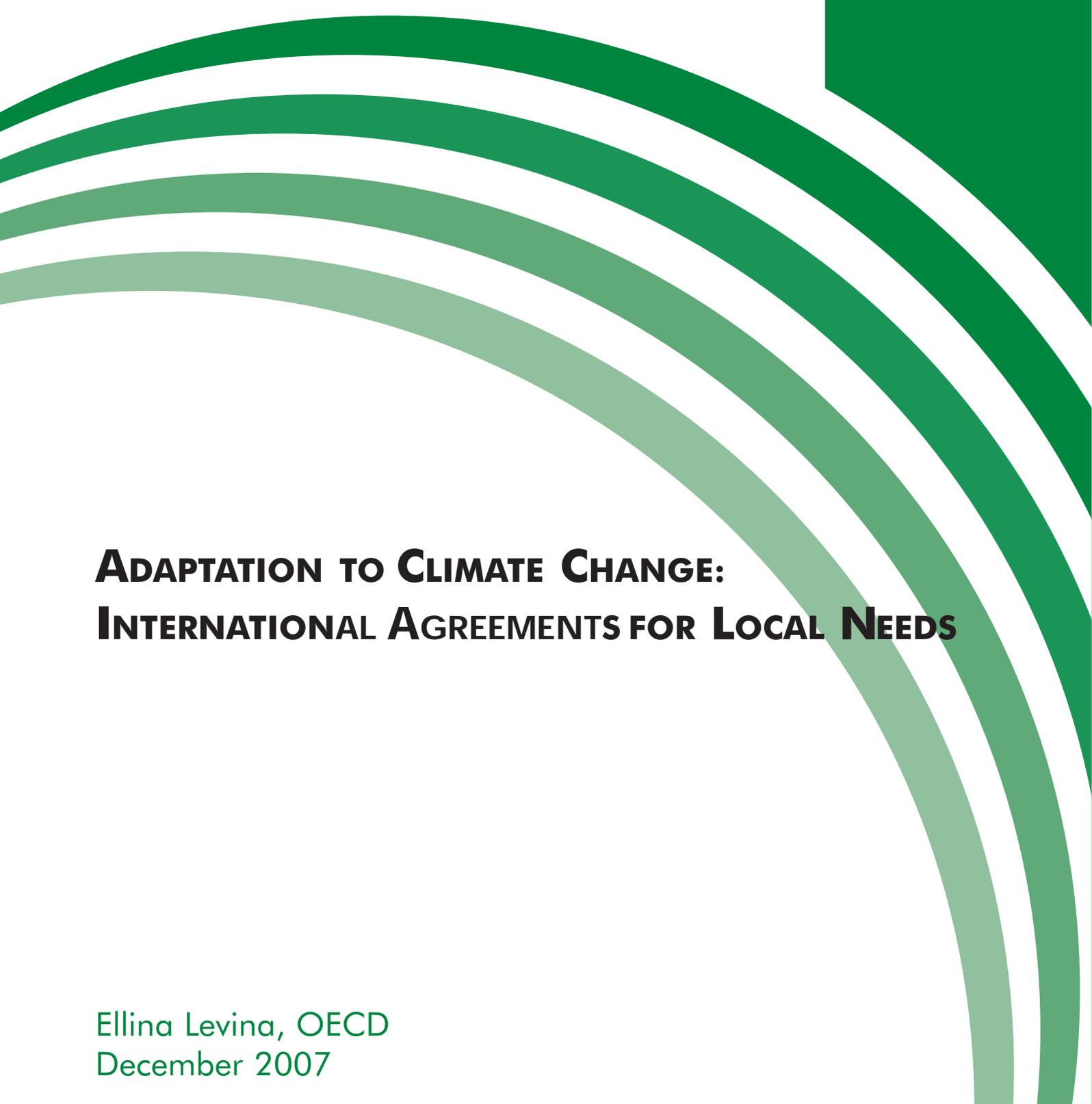


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ADAPTATION TO CLIMATE CHANGE: INTERNATIONAL AGREEMENTS FOR LOCAL NEEDS

Ellina Levina, OECD
December 2007

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Ellina Levina, Organisation for Economic Co-operation and Development

The ideas expressed in this paper are those of the author and do not necessarily represent the views of the OECD, the IEA, or their member countries, or the endorsement of any approach described herein.

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FOREWORD

This document was prepared by the OECD and IEA Secretariats in Autumn 2007 in response to the Annex I Expert Group on the United Nations Framework Convention on Climate Change (UNFCCC). The Annex I Expert Group oversees development of analytical papers for the purpose of providing useful and timely input to the climate change negotiations. These papers may also be useful to national policy-makers and other decision-makers. In a collaborative effort, authors work with the Annex I Expert Group to develop these papers. However, the papers do not necessarily represent the views of the OECD or the IEA, nor are they intended to prejudge the views of countries participating in the Annex I Expert Group. Rather, they are Secretariat information papers intended to inform Member countries, as well as the UNFCCC audience.

The Annex I Parties or countries referred to in this document are those listed in Annex I of the UNFCCC (as amended at the 3rd Conference of the Parties in December 1997): Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, the European Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America. Korea and Mexico, as OECD member countries, also participate in the Annex I Expert Group. Where this document refers to “countries” or “governments”, it is also intended to include “regional economic organisations”, if appropriate.

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All OECD and IEA information papers for the Annex I Expert Group on the UNFCCC can be downloaded from: www.oecd.org/env/cc/aixg

TABLE OF CONTENTS

EXECUTIVE SUMMARY	6
1. INTRODUCTION	9
2. CURRENT TREATMENT OF ADAPTATION BY THE UNFCCC AND THE KYOTO PROTOCOL	10
2.1 What has been achieved	10
2.2 Remaining needs	12
2.3 Existing legal framework for adaptation within the UNFCCC	12
2.4 GEF Funds related to adaptation	15
3. EXISTING POST-2012 ADAPTATION PROPOSALS AND THEIR LIMITATIONS	16
4. ADAPTATION TO CLIMATE CHANGE IN OTHER INTERNATIONAL FORA	21
4.1 International environmental agreements	21
4.2 International development agenda	25
4.3 Other multilateral fora	29
4.4 Summary and conclusions of this section	31
5. IDEAS FOR THE WAY AHEAD	32
5.1 Scope of activities to be included in a post-2012 agreement	32
5.2 Role of the UNFCCC	34
5.3 Specific goals of adaptation to be addressed	34
5.4 Targets and metrics to measure progress on adaptation	37
5.5 Funding mechanisms	40
5.6 Reporting and review	42
5.7 Responsibilities of the Parties	44
6. CONCLUSIONS	45
ANNEX I. OECD DAC CRS DATABASE PURPOSE CODES MARKED FOR ADAPTATION	46
ANNEX II. IMPACTS OF ADAPTATION PROJECTS ON BIODIVERSITY	51
ANNEX III. WORLD BANK GLOBAL FRAMEWORK FOR DISASTER RISK REDUCTION: ELIGIBLE COUNTRIES	53
ANNEX III. WORLD BANK GLOBAL FRAMEWORK FOR DISASTER RISK REDUCTION: ELIGIBLE COUNTRIES	54
ANNEX IV. LIST OF US-BASED FOUNDATIONS WITH INTERNATIONAL ACTIVITIES IN AREAS POTENTIALLY RELEVANT TO ADAPTATION	56
REFERENCES	57
GLOSSARY	59
ACRONYMS	60

LIST OF TABLES

Table 1. Comparison of proposed schemes for addressing adaptation in a post 2012 climate agreement	20
Table 2 Adaptation activities listed in NAPAs relevant to biodiversity	23
Table 3: Selected MDG targets and their relevance to adaptation and adaptive capacity	26
Table 4: ODA sensitive to climate change and ODA potentially relevant for adaptation	29
Table 5 Adaptation activities listed in NAPAs relevant to disaster risk reduction	30
Table 6 Goals of adaptation	36
Table 7: Categories of adaptation activities and their funding sources	41

LIST OF FIGURES

Figure 1 DAC Members' Net ODA 1990 - 2006 and DAC Secretariat Simulations of Net ODA to 2010	27
Figure 2 Financial flows into developing countries from OECD countries	28

Executive Summary

The goal of this paper is to outline a possible framework for an agreement on adaptation and to highlight several issues that need to be recognised and clarified to make such an agreement effective. The paper assumes that an agreement on adaptation will concern and serve all Parties, both Annex I and non-Annex I countries.

First, the paper examines the current state of play on adaptation at the international level. It looks at the framework for adaptation under the UNFCCC, highlights the achievements on adaptation that took place between 1992 and 2007, and summarises the gaps and challenges that need to be addressed in the future. It also looks at several recent proposals on how to treat adaptation in a post-2012 agreement on climate change. While these proposals address many important issues relevant to adaptation, they are not always linked with the international climate change negotiating process. Further, they tend to focus on financial mechanisms, often the same ones that have been proposed for generating funds for deforestation projects and additional GHG emission reduction projects in developing countries. The paper also examines other international agreements, such as the MDGs, the conventions on biodiversity and desertification, and the agreement on disaster risk reduction. It demonstrates that numerous activities under these agendas either constitute adaptation measures in themselves or can assist with adaptation. While these activities address some aspects of adaptation, the level of effort is not sufficient to meet current adaptation needs. Climate change adds urgency and yet another reason to implement the existing agreements and commitments.

Then the paper focuses on a possible architecture for an agreement on adaptation and examines several key building blocks that could be considered for such an agreement. The key elements under the examination include scope of adaptation activities, goals, targets and metrics for measuring progress, funding mechanisms, including national policies and measures to mobilise adaptation actions, reporting and review, and responsibilities of the Parties under the UNFCCC.

An agreement on adaptation could be more focused and targeted if the *scope of adaptation activities* is clearly defined. The scope could range from a more limited one that includes only activities directed at adaptation to the explicit impacts of climate change (e.g., sea level rise, permafrost and glacier melting) to a much broader scope that includes many activities that contribute to adaptive capacity and adaptation to various climate change impacts and at all levels. While the limited scope could be more focused and feasible in terms of required resources, it has serious limitations in that it does not reflect the multi-sectoral nature of impacts, and that the most efficient adaptation may be achieved by working across impacts. It also does not reflect the potentially problematic issue of determining which impacts are the explicit results of climate change. A broader scope could be built on the scope outlined by the work of the SBI and SBSTA on adaptation, and in particular by the Nairobi Work Programme. A staged approach could also be envisaged first focusing on a more limited scope of adaptation activities and then moving towards a broader scope.

The *role of the UNFCCC* in relation to the defined scope will also need to be defined. The current role of the UNFCCC as a catalyst of adaptation actions could be reinforced. The UNFCCC could also provide a forum for exchange of information among all major international agreements/activities that include adaptation, and among relevant UN bodies and other international organisations active in the field of adaptation. Recognising that there is a wide range of activities occurring under other international agreements that are closely related to adaptation, co-ordination in order to avoid duplication of effort seems to be a significant challenge. Since activities related to adaptation elsewhere are under-funded and progress is very slow, the UNFCCC may decide to play a stronger role in catalysing and coordinating all major avenues of adaptation. In summary, the UNFCCC could play a role in:

- Catalysing adaptation actions at national and international levels
- Coordinating adaptation activities at the international level
- Stimulating development of tools and methodologies for adaptation
- Providing a forum for exchange of information among Parties and relevant organisations
- Identifying the most vulnerable countries in need of assistance

- Identifying and requesting financial resources and providing guidance on how to distribute them
- Identifying new mechanisms for mobilising adaptation (e.g., insurance, adaptation micro-financing)
- Setting best practices, “standards” for adaptation (e.g., for sectors, specific locations, ecosystems)
- Stimulating R&D and technology transfer of adaptation.

Goals of adaptation: The specific goals of adaptation to climate change vary among countries. However, it should be feasible to reach international agreement on several broad objectives of adaptation. These objectives could either be *result-oriented* (e.g., coastal economies are protected from sea level rise, access to water is not jeopardised by climate change, people and property are protected from floods and hurricanes) or *process-oriented* (e.g., adaptation is incorporated in national policies and strategies for climate sensitive sectors, early warning systems are established for all hydro-meteorological hazards, etc.). Result-oriented goals define the ultimate objectives of adaptation actions. The main advantage of this kind of goals is that they clearly state what exactly we are trying to achieve by agreeing on certain actions. However, the achievement or non-achievement of these goals is not necessarily a direct result of deliberate adaptation actions directed at achieving these goals. Other factors that could be completely unrelated to our actions or inactions specifically on adaptation could have significant impact on achievement of these goals. Result-oriented objectives are more suitable for national purposes as it is the responsibility of national governments to protect their citizens from various forms of danger. Process-related goals have other advantages and disadvantages. They are more flexible, and easier to monitor. Progress on achieving these goals can be easily assessed. Achievement of these goals gives a sense of accomplishment in terms of doing the right things and moving in the right direction. However, achievement of these goals does not necessarily mean that expected results regarding adaptation to climate change will also be achieved. For an agreement on adaptation, it is possible to envisage a combination of result-oriented and process-oriented goals.

Indicators/metrics to measure progress on adaptation: Several options of indicators to measure progress on adaptation are possible: financial indicators, adaptation-aware development indicators, and sectoral policies indicators. *Financial indicators* could include the share of GDP devoted to domestic adaptation actions. In addition, developed country Parties could agree on a certain financial contribution to developing countries to assist them in developing and implementing adaptation actions. The lack of cost estimates of adaptation will hamper applicability of such indicators as it will be difficult to compare them with the real needs on the ground. The paper also suggests several *adaptation-aware development indicators* adopted from the indicators for the MDGs and SD that could be applied to adaptation. Given the overlap of potential adaptation objectives with sustainable development, some of the metrics and indicators developed to measure progress on achieving the MDGs and the goals of sustainable development could possibly be used to measure progress on adaptation. The advantage of using some of the existing indicators is that there is already a base of statistical information and experience with reporting data according to these indicators. *Policy indicators* are another possible way of ensuring that adaptation issues are being consistently considered in public policy and investment decisions. Indicators could be designed to reflect interactions between sectors and climate change impacts, including positive and negative impacts of sectoral activity on the climate vulnerability as well as impacts of climate change on the sectoral activity. They could also be designed to reflect economic linkages between the sector and climate change impacts, including cost and benefits of adaptation measures to the sector and the economy as a whole.

Funding mechanisms for adaptation: The paper briefly touches on funding sources for adaptation and the mechanisms that can be used to mobilise these sources for additional adaptation actions in all countries. It identifies several major groups of funding sources that are in a position to fund adaptation actions (some of them are applicable to developing countries only). They are national governments (including ODA), the private sector, private foundations, and Global Environment Facility (GEF) dedicated funds. There are various mechanisms that can be envisaged for each of these groups to mobilise their actions on, and funding for, adaptation. Some of these mechanisms are at the responsibility of national governments. The UNFCCC can play an important role in mobilising funding for adaptation

by setting international requirements and commitments for domestic actions and providing methodological support to Parties on how to design and implement these actions.

Several innovative measures could be proposed to address special adaptation needs of low income and vulnerable countries. For example, development of micro-financing structures in developing countries would allow local communities, civil society groups and municipalities to implement adaptation actions on their own. Micro-financing structures could combine financial services with clearing-house services that would facilitate access to relevant information and best practices. ODA funding could be used to assist (and back up) the private sector in setting up such micro-financing services.

National policies to mobilise adaptation actions: According to the recent report by the UNFCCC, adaptation investment needs could reach USD 193 billion by 2030. It is clear that finding new significant financial resources to address adaptation, given numerous other political priorities that require financing, will be difficult. However, it is important not to downplay the role that government policies and international guidelines on best practices can play in mobilising and directing resources into the necessary actions. There are several mechanisms that could be used to facilitate adaptation process. For example, national governments could incorporate climate change and adaptation requirements into existing Environmental Impact Assessments (EIAs). National governments could incorporate adaptation provisions into national and sectoral policies and strategies. ODA could be guided by specific guidelines on how to integrate adaptation into development assistance activities. The OECD is already in the process of developing such guidelines. The private sector will implement some adaptation directly out of self-interest. However, at this stage of knowledge and experience, it could be helpful to develop guidelines for enterprises (starting with multinational enterprises) on how to integrate climate change concerns into their routine risk assessment and strategic decision-making.

Reporting and review: Reporting will be an important component of an agreement on adaptation. Reporting requirements will depend on the agreed scope of activities, goals and responsibilities of the Parties. All Parties could be asked to report on major national policies and measures that address adaptation and/or integrate adaptation into sectoral and national policies. Non-Annex I Parties could be asked to report on their adaptation priority needs (similar to the outcomes of NAPA process), and implementation of adaptation projects (funded through ODA) on the ground. It could be envisaged that the Annex I Parties could be required to report on ODA that addresses adaptation in developing countries (some countries already provide such information voluntarily). This information could be synthesised and reported back to the UNFCCC Parties.

The process of National Communications (NC) could be used for more detailed reporting on adaptation. However, the guidelines for developing the adaptation section of NCs will need to be revised to satisfy the agreed purposes and scopes of the adaptation agreement. The framework (composed of nine areas of work) designed under the Nairobi Work Programme could provide a useful basis for reporting on adaptation. Given differentiated responsibilities of the Parties and different abilities to address adaptation, different reporting guidelines could be envisaged for different groups of countries. It may be practical to revisit the list of Annex I and non-Annex I countries for the purposes of adaptation. For example, non-Annex I countries could be re-grouped into several groups depending on countries' vulnerabilities and ability to address adaptation (or certain aspects of it) on their own.

The review process could be modelled on the UNFCCC review process of NCs or on many other examples of reviews of national policies, including the OECD Environmental Performance Reviews of OECD member countries, the UN Economic Commission for Europe's similar process for European countries that are not OECD members, and the IEA's energy policy reviews of its member countries and some non-members. Country review visits could provide a platform for exchange of information, ideas and expert dialogue. In addition to generating valuable country-specific information and assessment, such reviews could also assist countries in formulating their adaptation strategies and in acquiring knowledge of best practices and experiences from other countries.

This paper does not intend to give recommendations on how to design an agreement on adaptation; rather it offers information, ideas and analysis that could be used by Parties in designing such an agreement.

1. Introduction

Despite current efforts and attention to adaptation, a big gap remains between adaptation needs and current efforts to address them. It has been recognised by both developing and developed countries that adaptation deserves a special place in any climate regime that will follow the Kyoto Protocol after it expires in 2012 (especially if the current trend of global GHG emissions continues). This paper outlines a possible framework for an agreement on adaptation and highlights several issues that need to be recognised and clarified to make such an agreement effective.

Adaptation to climate change is multidimensional; it encompasses various activities in various sectors. While the basis for adaptation is climate driven – we adapt to impacts of climate change, the responses in most cases have roots in many other societal, industrial and governmental activities that have nothing to do with climate itself. The question that policy makers need to answer is what aspects of adaptation can and should be addressed by the UNFCCC and what aspects are already and/or should be addressed by other agendas (for example, development agenda or sustainable development). The same question can be asked about extreme events and their treatment (preparedness, mitigation and response). Should they be addressed by a climate agreement? Or should they continue to be treated separately by relevant institutions and frameworks? If so, what formal ways can be envisaged for input from and cooperation with the UNFCCC?

The ability of society to adapt to climate change depends on the extent of climate change, as well as on available technical, financial, institutional and other capacity. In other words, adaptive capacity is influenced by a variety of things, including education (general and specific), health care, financial resources, scientific information and understanding of climate change, availability of technologies, techniques and practical tools for various sectors and natural resources management. At the same time, adaptive capacity does not guarantee adaptation actions. Adaptation occurs when in addition to adaptive capacity there is also a political will and formal mechanisms that enable adaptation.

If having adaptive capacity is an essential prerequisite for planned adaptation actions, should actions directed at building adaptive capacity be included in a possible international regime on climate change adaptation? Should all the aspects of adaptive capacity be included or only those directly related to climate, e.g., observation and monitoring stations, climate projections, early warning systems, and other issues related to climate and weather.

The whole scope of adaptation needs is not known. Our current knowledge is based on today's experience and available projections of climate change and social factors. New needs may arise that will require new adaptation strategies or urgent actions. So, adaptation should be seen as a dynamic and evolving process. However, it is important to agree on the scope of the concept of adaptation that can be used in an international agreement. Any international agreement on adaptation¹ would be more meaningful if it could be based on a clear definition of what it encompasses. It is also important to recognise that “the options for successful adaptation diminish and the associated costs increase with increasing climate change” (IPCC Fourth Assessment Report). Our knowledge of adaptation costs and eventual limits of adaptation is embryonic.

It has been established that adaptation has predominantly local benefits. However, it also has to be recognised that when certain ecosystems are concerned (watershed, wetlands, forests), local actions (of adaptation or mal-adaptation) may have ecosystem-wide impacts. In addition, lack of adaptation in one place can create situations of mass migration that would affect other places/countries. No adaptation in one vulnerable place could cause security concerns for neighbouring countries, or could simply cause business losses or lost business opportunities for investors from other countries. In this sense, adaptation is similar to development. While it should be done out of self-interest, when it is not occurring, it can have negative economic and social effects on other countries. Thus, adaptation to climate change could be seen as either a local issue with international benefits or as an international issue with local benefits.

¹ The paper does not imply that a separate agreement on adaptation is needed, what is meant is that one of the key components of an international agreement on climate change will be on adaptation.

Another set of issues that needs to be addressed directly relates to possible components of an international agreement on adaptation. These questions include but are not limited to the following: What concrete goals of adaptation can be set? What indicators/metrics can be used to report on and monitor progress on adaptation? What responsibilities can be assigned to various participants/Parties?

The paper starts with a brief overview of how adaptation is currently treated by the UNFCCC and the Kyoto Protocol. Section 2 also offers a brief summary of what has been achieved so far and what gaps remain. Section 3 provides summary and analysis of current proposals from various organisations on how to address adaptation in a post-2012 climate regime. Section 4 is the core of the paper. It provides an analysis of synergies between activities under several relevant international agreements and adaptation to climate change. The agreements that were analysed are Convention on Biological Diversity, Convention on Desertification, the International Strategy for Disaster Reduction, Millennium Development Goals, and Official Development Assistance to developing countries. Section 5 examines several important elements that could be considered by an agreement on adaptation. These elements are:

- scope of activities to be included and roles of the UNFCCC
- goals of adaptation
- targets and metrics to measure progress on adaptation
- reporting and review
- funding mechanisms, including policies and measures to mobilise adaptation actions
- responsibilities of the Parties.

There is also a number of Annexes to the paper. Annex I provides a list of categories of the ODA activities contained in the OECD CRS database and indicates assumptions used in the paper for sectors/activities sensitive to climate change and relevant for adaptation. Annex II provides a table of impacts of adaptation projects on biodiversity; this table was developed under the Convention on Biodiversity. Annex III provides a list of developing countries that are ranked by the share of GDP at risk for disasters. The list was developed by the World Bank and will be used to provide the World Bank's assistance through the WB Global Framework for Disaster Risk Reduction. Annex IV offers a list of US based foundations with international activities in areas potentially relevant to adaptation

2. Current Treatment of Adaptation by the UNFCCC and the Kyoto Protocol

This section outlines how the UNFCCC and the Kyoto Protocol treat adaptation to climate change. It summarises the main achievements related to adaptation and the remaining needs.

2.1 What has been achieved

An overview of actions and decisions on adaptation within the UNFCCC that took place in the last 15 years (between 1992 and 2007) leads us to the observation that a lot has been done but more remains to be achieved. Among the most important achievements are the following (in no particular order):

- Funds dedicated to adaptation have been created (Special Climate Change Fund, Least Developed Countries Fund, and Adaptation Fund).
- Capacity on vulnerability and adaptation assessment is building up. The Nairobi Work Programme (in the framework of SBSTA activities) plays an important role in this regard as well as the work done in accordance with COP decisions and in the frameworks of other SBSTA decisions (e.g., compendium on methods and tools) or SBI decisions (e.g., regional workshops and expert meetings on adaptation).

- Information on vulnerability, climate projections, and possible adaptation actions has been accumulating and is routinely shared among the Parties. The main vehicles for this exchange are National Communications, NAPAs, submissions by Parties under the Nairobi Work Programme, databases and materials prepared by the UNFCCC Secretariat (e.g. “Compendium on methods and tools to evaluate impacts of, vulnerability and adaptation to, climate change”, database of local coping strategies, database of adaptation planning and practices); capacity building workshops and workshops in the framework of the Nairobi Work Programme.
- National Adaptation Programmes of Action (NAPA) process has been launched. Urgent adaptation needs and priorities of the LDCs are being identified. Several adaptation priority actions are already under implementation. As of August 2006, 44 NAPAs have been launched (out of 49 eligible countries), 21 of them have been completed to date.
- National Communications are a useful tool to report information on national vulnerability assessments, adaptation needs and priorities. All UNFCCC Parties have developed at least one National Communication. However, national communications have not been as effective as NAPAs in formulating priorities for adaptation. National Communications could be even a better source of information on adaptation needs for national and international players, if all UNFCCC Parties had to conduct a NAPA type analysis and prioritisation of adaptation actions for their National Communications.
- To fulfil their obligations under Article 4 of the UNFCCC and Article 10 of the Kyoto Protocol, several countries have launched national processes on developing and implementing National adaptation strategies (examples include the EU, Australia, the UK, Finland, France, Denmark, New Zealand, South Korea).
- The analytical basis for adaptation is constantly developing. The IPCC Fourth Assessment Report summarised a huge body of literature on adaptation. The UNFCCC process catalyses actions at the national level and at the level of various relevant international organisations on vulnerability assessments and adaptation (e.g., WHO’s report on climate change impacts on health, OECD work on integrating adaptation into development agenda). COP and SB meetings provide an important forum for exchanging information among Parties and organisations on latest findings on and experiences with adaptation.
- The terminology of adaptation, vulnerability, adaptive capacity, resilience, and other related terms have been defined by the IPCC.
- Best practices on adaptation are emerging and gaining acceptance. The NWP plays an important role in gathering and disseminating this information. In addition, many other organisations (including NGOs and international multilateral organisations) create useful databases on adaptation practices.
- Links with other conventions and the MDGs are being explored. The Nairobi Work Programme offers opportunities for communication, cooperation, and coordination among three Rio Conventions, with the ISDR and relevant international organizations (e.g., FAO, OECD, WMO, and others). Other links have been explored through the Joint Liaison Group (JLG) between the three Rio Conventions which was established as an informal forum for exchanging information, exploring opportunities for synergistic activities and increasing coordination. For example, the JLG agreed to draft an information note on adaptation activities, plans and programmes adopted within the framework of each convention, to be distributed at relevant meetings. This note should be ready before the thirteenth session of the COP to the UNFCCC.
- Stage I of agreed activities on adaptation under the Decision 11/CP.1 seems to be completed, except that the countries particularly vulnerable to climate change have not been formally identified.

2.2 Remaining needs

Although a significant progress on understanding adaptation has been achieved to date many pressing adaptation needs remain, particularly regarding implementation of adaptation measures. The most important gaps in current agreement on adaptation have been voiced by Parties as the following:

- ***Actions on adaptation are still very limited and sporadic.*** The main reasons for this seem to be gaps in knowledge and understanding of climate change and its uncertainties, lack of financial resources, and low priority of adaptation on national agendas. There is limited experience in all countries in incorporating various levels of uncertainty of climate and socio-economic projections in risk assessments. The capacity to downscale global climate change models and analyse local impacts of projected changes in climate is also limited or absent in many countries. More analytical work is needed at the international, national and regional levels to improve knowledge and understanding of climate change and its impacts at various scales. Better integration of adaptation with national, sectoral and international strategies is also needed. High-level leadership for adaptation is needed to encourage actions. Available projections of GHG emissions up to 2030-2050 and associated temperature increases would probably provide impetus to awareness and leadership on adaptation at high levels.
- ***Available funds for adaptation, especially in developing countries, are insufficient.*** There is a general agreement that the cost of adaptation will be substantial and more financial resources need to be generated/mobilised. There is a need for a clear plan on how to generate predictable level of adaptation actions and funding and how to allocate these funds most effectively.
- ***Adaptation is still confined to the agenda of the climate change community.*** It rarely shows up in the work programmes of other sectors that should be concerned with adaptation. A big task that still remains is to build awareness about adaptation among decision-makers in the sectors sensitive to climate change, such as water, agriculture, health, energy, building, natural resources management (especially coastal zones), and others. More analytical work is needed on how to integrate adaptation into sectoral policies.
- ***Formal links with other conventions and the MDGs are not established.*** Recognising numerous synergies between adaptation and actions to meet objectives of several other conventions and international agreements, it is important to establish formal links between the UNFCCC and these conventions and agreements. More formalised links between the UNFCCC Secretariat, secretariats of other relevant conventions and other UN organisations may also be needed.
- ***Clear responsibilities regarding adaptation and action plans for Parties are not defined.*** There is no system in place to measure progress on adaptation.
- ***Priorities regarding adaptation actions and countries requiring assistance in adaptation are not defined.*** The term “particularly vulnerable” is often used in the Convention text and in many follow-up decisions; however this group of countries is still not defined. According to the Decision 11/CP.1 particularly vulnerable countries had to be defined in the short-term of implementing the Convention. According to the same Decision, Stages II and III (implementation of adaptation measures) were envisaged for these countries. It may also be helpful to define several groups of countries depending on their particular adaptation needs and ability to address these needs on their own. International commitments on adaptation could be differentiated among various groups of countries (based on needs and abilities).

2.3 Existing legal framework for adaptation within the UNFCCC

Adaptation to climate change has been one of the key issues of the international dialogue on climate change since its official launch in 1990. The UN Framework Convention on Climate Change of 1992 in its Article 4 sets several commitments related to adaptation:

- Article 4.1 b) requires that all Parties formulate and implement measures to facilitate adequate adaptation to climate change.
- Article 4.1 e) calls for cooperation in preparing for adaptation to the impacts of climate change; In particular it requires that Parties develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods.

In addition, the UNFCCC states that all Parties shall “take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions...” It also calls for cooperation in scientific, technical, technological, socio-economic and other research, systematic observation and development of relevant data, education, training, and public awareness.

The Convention, in its Article 4.4, also obliges the developed country Parties to “assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.” Article 4.8 requires that funding, insurance and transfer of technologies are provided to developing country Parties to meet their specific needs arising from the adverse effects of climate change.

As for the specific financial obligations, the Convention (Article 4.3) requires that developed countries provide new and additional financial resources to meet full costs incurred by developing country Parties in complying with their reporting obligations, - national communications (under Article 12, para 1); and that developed countries provide financial resources, including transfer of technology, needed by developing countries to meet the full incremental costs of implementing adaptation measures.

COP 1 with its Decision 11/CP.1 established initial guidance on priorities and eligibility criteria for funding by the financial mechanism (the GEF). The guidance defined a three stage approach to the actions on adaptation. Stage I (short-term) was envisaged to include studies of possible impacts of climate change, identification of particularly vulnerable countries or regions, policy options for adaptation, and capacity building. Stages II and III were envisaged for the medium and long term and for the particularly vulnerable countries identified in Stage I. Stage II would include measures to prepare for adaptation (as envisaged in Article 4.1 (e)). Stage III would include measures to facilitate adequate adaptation, including insurance, and other adaptation measures (as envisaged by Article 4.1(b) and 4.4).

The Kyoto Protocol further reaffirms the Parties’ commitments on adaptation stated by the Convention. Article 2 (paragraph 3) of the Kyoto Protocol calls for Parties to implement policies and measures “...to minimize adverse effects of climate change.” Article 10 requests that Parties “formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures... to facilitate adequate adaptation to climate change.” A special financing provision for adaptation has been created by Article 12.8 of the Kyoto Protocol: “Parties shall ensure that a share of the proceeds from CDM is used to assist developing country parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation”.

Adaptation has not received sufficient attention until 2001 when the IPCC Third Assessment Report was released. The report presented ample evidence that the climate system is already changing and documented numerous accounts of climate change impacts such as sea-level rise, increased temperatures, modified regimes of precipitations, effects on river run-offs, glacier melting, and others, and provided impetus to the process of addressing adaptation more seriously by the Convention.

Since 2001, several important decisions relevant to adaptation have been made in the climate change negotiations. The Marrakech accords adopted in 2001 by COP 7 established a separate work programme for least developed countries (LDCs). This work programme includes the preparation of national adaptation programmes of action (NAPAs), which opens up a simplified channel for LDCs to inform the international community of their prioritised urgent and immediate adaptation needs. The COP 7 by its Decision 5/CP.7 established specific funds: the Special Climate Change Fund to fund activities related to information and methodologies, and vulnerability and adaptation; and a Least Developed Countries Fund

to support the work programme for the least developed countries, - which is mainly to fund NAPA process. Decision 10/CP.7 established an Adaptation Fund to finance concrete adaptation projects and programmes in developing countries. However, the Adaptation Fund is not yet operational and its assets depend on the scale of the CDM market.

At COP 10, Parties concluded negotiations on further implementation of Decision 5/CP 7 related to the implementation of activities addressing adverse effects of climate change and adopted Decision 1/CP10. The Decision 1/CP 10, entitled "The Buenos Aires programme of work on adaptation and response measures" requested implementation of actions addressing adverse effects of climate change through, among others, information and methodologies collection, sharing and dissemination, modelling, reporting in Parties' National Communications their special needs and circumstances, assessing vulnerability and adaptation options. Decision 1/CP.10 also requested the Secretariat to organise regional workshops, reflecting regional priorities and an expert meeting for Small Island Developing States.

At COP 11, in 2005, Parties adopted conclusions related to the "Five-year programme of work on impacts, vulnerability and adaptation to climate change" (Decision 2/CP11). The work programme was renamed as the "Nairobi work programme on impacts, vulnerability and adaptation to climate change" at COP 12. The objective of the Nairobi Work Programme (NWP) is twofold: (1) To assist countries, in particular developing countries, including the least developed countries and small island developing states, to improve their understanding and assessment of impacts, vulnerability and adaptation; and (2) To assist countries to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound, scientific, technical and socio-economic basis, taking into account current and future climate change and variability.

The NWP is structured around nine areas of work, consistent with the action-orientated sub-themes of decision 2/CP.11. They are: Methods and tools; Data and observations; Climate modelling, scenarios and downscaling; Climate related risks and extreme events; Socio-economic information; Adaptation planning and practices; Research; Technologies for adaptation; Economic diversification

In addition to the decisions on the process and progress made in implementing these decisions, a methodological capacity to address vulnerability and adaptation has been developing at the same time. In 1999, the Secretariat prepared a report entitled *Compendium of Decision Tools to Evaluate Strategies for Adaptation to Climate Change*. The report aimed to assist Parties in applying the best available methods to assess the impacts of climate change, their vulnerability to climate change, and adaptation options. The Compendium was updated in 2004 following expert consultations, and a new updated version called the *Compendium on methods and tools to evaluate impacts of, vulnerability and adaptation to, climate change* was launched at COP 10 in Buenos Aires.

Detailed reporting guidelines have been developed to assist Parties in reporting their vulnerability assessments and adaptation actions in the National Communications. The revised (at COP 5) reporting guidelines recommend specific analytical tools to be used for the analysis of vulnerability and adaptation. "Parties are encouraged to use the Intergovernmental Panel on Climate Change (IPCC) Technical Guidelines for Assessing Climate Change Impacts and Adaptations and the United Nations Environment Programme (UNEP) Handbook on Methods for Climate Change Impacts Assessment and Adaptation Strategies. Parties may refer, *inter alia*, to integrated plans for coastal zone management, water resources and agriculture. Parties may also report on specific results of scientific research in the field of vulnerability assessment and adaptation."

Guidelines for the preparation of initial national communications from non-Annex I Parties was revised at COP 8 (New Delhi, 2002). In response to a request by SBI 18 (Bonn, 2003), the Secretariat prepared a user manual to facilitate the use of the UNFCCC guidelines. The user manual, launched at COP 9 (Milan, 2003), is designed for use by Parties and national experts. The user manual has detailed instructions on how to report on Measures to Facilitate Adequate Adaptation to Climate Change. It also lists reference materials that can be used for vulnerability and adaptation assessment.

In addition to these guidelines, a more detailed guide (Decision 28/CP.7) on prioritising adaptation measures was developed for LDCs to help them in developing their NAPAs. The guidelines encourage synergies between adaptation actions and actions on other relevant processes, including conventions on biodiversity and desertification, sectoral policies, poverty reduction, sustainable development strategies, and others. It also offers a list of criteria to be used in a prioritisation exercise, and a list of fields which these criteria can be applied to. Some countries, for example, Lesotho, Mauritania, Burundi, and others have done a remarkable job in prioritising among selected adaptation projects.

2.4 GEF funds related to adaptation

The GEF-managed funds available for adaptation projects (including SPA, SCCF and the LDCF), amount to a total of over USD 200 million².

In response to the COP 7 guidance, the GEF established the Strategic Priority “Piloting on Operational Approach to Adaptation (*SPA*)”. The SPA supports pilot and demonstration projects that address local adaptation needs and generate global environmental benefits, which can include reducing the risk of biodiversity loss, accelerating sustainable land management, and integrated coastal zone management. In 2003 USD 50 million was allocated to this area of work. Ten projects (7 full size and 3 medium size) have been approved so far, totalling USD 25 million. Co-financing for the adaptation projects was much bigger than the core funding provided by the GEF, the total amount reaching USD 62.81 million. So, the total financing of adaptation projects through the GEF Trust Fund in the period of 2003-2006 was around USD 98 million.

During the reporting period, the small grants programme gave 135 grants to non-governmental organisations and community-based organisations for community based climate projects totalling US\$ 3.3 million in GEF funding (plus 5.27 million were leveraged) – none of them was on adaptation. However, under the SPA, it was proposed that up to 10% of the resources be allocated to the piloting of community adaptation initiatives. To this end, USD 5 million was allocated for the Community Based Adaptation (CBA) Programme in ten pilot countries: Bangladesh, Bolivia, Guatemala, Jamaica, Kazakhstan, Morocco, Namibia, Niger, Samoa, and Vietnam

GEF projects approved under the strategic pilot on adaptation seek to ensure the delivery of global environmental benefits in the face of climate change. Another principle of GEF funding is that the GEF funds incremental or additional costs associated with transforming a project with national/local benefits into one with global environmental benefits.

Activities supported under the Least Developed Countries Fund and the Special Climate Change Fund link adaptation to development and reduce climate change risks by integrating adaptation in key development sectors, such as water, agriculture, health, disaster risk management, and infrastructure. Projects under the LDCF and the SCCF address a global impact and do not need to generate global environmental benefit. The *LDCF* is designed to support projects addressing urgent and immediate adaptation needs as identified by NAPAs³. As of August 2006, financial support had been provided for the preparation of 44 NAPAs (out of 49 eligible countries) and two global support projects. The GEF funding for these activities came to USD11.6 million. The LDCF also received first 6 submissions for funding of priority actions identified by NAPAs. These six submissions came from Bangladesh, Bhutan, Malawi, Mauritania, Niger and Samoa. The expected LDCF grant for these projects is USD15.84 million, with expected co-financing of USD 41.86 million. As of June 2007, the LDC Fund has received USD160 million in contributions and investment income, (UNFCCC, 2007).

The SCCF is aimed at supporting activities in adaptation and technology transfer. The SCCF is designed to finance adaptation activities that increase the resilience of national development sectors to the impacts

² FCCC/CP/2006/3

³ GEF/LDCF.SCCF.2/Inf.4

of climate change⁴. The SCCF will support capacity building for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning for droughts and floods in areas prone to extreme weather events. As of May 2007, six projects have been approved under the SCCF adaptation programme and two other projects are submitted for approval. The total expected SCCF grant is about USD 25.17 million with expected co-financing of USD 92.67 million. Total budget of the projects in the pipeline is USD41.22 million with co-financing of USD219.08 million⁵. The Climate Convention guidance identified, among others, the following priority areas for adaptation activities under the SCCF: Water resources management; Land management; Agriculture; Health; Infrastructure development; Fragile ecosystems (including mountain ecosystems); and Integrated coastal zone management.

The Adaptation Fund envisaged by the Kyoto Protocol (Article 12.8) and established by decision 10/CP.7 was created to “support concrete adaptation projects and programmes” in developing countries. It is not yet operational. It will be funded through a 2% share of the proceeds on CDM transactions. Parties have agreed that developing country Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change are eligible for funding from this fund. The Adaptation Fund will assist these countries in meeting the costs of adaptation by financing concrete adaptation projects and programmes that are country driven and are based on needs, views and priorities of eligible Parties. The Parties are still discussing institutional arrangements for this fund.

3. Existing Post-2012 Adaptation Proposals and their Limitations

This section provides an overview and analysis of recent proposals on how to address adaptation in a post-2012 climate regime by different organisations.

- *Pew Center*⁶

Pew Center proposes three broad approaches to future international efforts on adaptation:

- a) Adaptation under the UNFCCC focussing on
 - National adaptation strategies (based on NAPA process);
 - Committing reliable funding for high priority implementation projects (priority given to the needs directly arising from climate change impacts such as sea level rise or glacial melting); and
 - Establishment or designation of an international body to provide technical support, judge the adequacy of national strategies, and select high priority projects for funding.
- b) Integration with development (factoring adaptation into the full range of development support). This approach could closely complement the Convention-based approach; and
- c) Climate insurance (committing funding to support climate relief or for losses resulting from climate change and climate variability). Two possibilities for climate insurance are proposed: international response fund (donor countries commit to regular contributions to a fund that would assist countries suffering extreme and/or long-term climate impacts); and insurance “backstop” (donor countries support introduction of insurance-type mechanism in vulnerable countries by committing fund to subsidise premiums or to reinsure governments or primary insurers).

The proposal also states that existing funding for adaptation will have to be supplemented or replaced with a stronger, dedicated source such as a wider levy on the emissions market or funding commitments under an agreed formula.

⁴ GEF/LDCF.SCCF.2/Inf.4

⁵ GEF/LDCF.SCCF.2/Inf.3

⁶ From the publication “*Adaptation to climate change: International policy options*”, 2006

- ***European Climate Platform***⁷

This paper examines adaptation in the framework of three distinct criteria: link to human development, responsibility, and local solutions. The paper also suggests a broad definition of adaptation that includes both, efforts to implement adaptive responses and efforts to enhance adaptive capacity. The paper proposes four options for achieving adequate adaptation:

- a) Expand ODA infrastructure to accommodate the required adaptation
- b) Create or extend a globally centralised fund
- c) Create locally-focused funds such as Autonomous Adaptation Funds
- d) Create insurance mechanism for adaptation

This proposal also discusses briefly market-based mechanisms for generating funding for adaptation, a kerosene tax in the aviation sector, a levy on AAUs obtained through emissions trading and ERUs obtained by JI projects, similar to the levy on CDM projects.

The paper suggests creating an informal dialogue on adaptation between developed and developing countries, and a Climate Change Adaptation Forum for multiple stakeholders to regularly exchange information.

- ***Toward a Post-2012 Climate Change Regime***⁸

This proposal calls to clarify two fundamental issues before any agreement on adaptation can be reached: 1) the scope of adaptation; and 2) country groupings that can be established according to their adaptive capacity and expected impacts from climate change. The paper distinguishes three types of adaptation measures:

- Forward-thinking measures in avoiding expected damage or preventing damage that has occurred in the past;
- Measures on damage repair, restoration or compensation. Includes insurance;
- Measures to strengthen the general capacity.

The proposal also calls for a separate legal instrument on adaptation under the Convention. In terms of generating financial resources to pay for adaptation, the paper suggests an adaptation levy that would be applied to all GHG emissions. The levy would be differentiated and different rates would apply to three different groups of countries (Annex I countries, two groups of developing countries). Funding priority will be given to the implementation of projects identified in the NAPAs. Insurance type mechanisms are also proposed.

The paper also proposes two approaches for establishing an international insurance mechanism. Insurance based on contributions from emitters (non risk community), and insurance based on contributions from affected countries.

- ***IISD***⁹

The proposal on Adaptation is a part of a bigger paper by the IISD on a post-2012 climate change regime. This proposal examines separately possible financing options for adaptation, and types of actions

⁷ Based on the publication by Kartha, S., Bhandarui, P., van Schaik, L., Cornland, D., and Kjellen, B., (2006), *Adaptation as a Strategic Issue in the Climate Negotiations*. Center for European Policy Studies, ECP Report #3

⁸ Based on the publication by Blok, K., Hohne, N., Torvanger, A., and Janzic, R., (2005), *Towards a Post-2012 Climate Change Regime*

⁹ Based on the draft publication by Parry, J.-E., and F. Gagnon-Lebrun, *Adaptation Post-2012* (forthcoming)

in support of adaptation. In terms of types of actions, the paper distinguishes 5 types: National adaptation strategies; Strengthening institutions and governance; Development, dissemination and deployment of new technologies for adaptation; Information provision and awareness enhancement; Implementation at the local, sectoral and regional level. The paper concludes that national strategies, stronger institutions and governance, and further capacity building efforts supported by access to the appropriate information, tools and technologies can help ensure a significant up-scaling in efforts to integrate adaptation into policies, plans and projects at local, national, regional and international level. However, the paper does not define what role the UNFCCC can play in these 5 types of actions

In terms of financing options, the paper examines Development funds (development assistance agencies and UN multilateral development organisations; private sector investments, non-governmental development organisations, developing country governments); Disaster relief funds (international organisations; insurance and risk transfer options; alternative risk transfer mechanisms); and Innovative funding mechanisms (an international carbon or fossil fuel tax/levy, levy on GHG emissions; solidarity levy on aviation, international air travel adaptation fund, levy on marine bunker fuels, currency transaction development levy, adaptation credit).

The analysis of adaptation actions and financing sources done for this paper comes to the conclusion that the UNFCCC's role in adaptation is probably secondary. The paper looks at a possibility of an agreement outside the UNFCCC, a Climate-wise Development Treaty that may generate greater and more predictable funding for adaptation.

As for the funding provided under the UNFCCC, this proposal concludes that it could primarily be directed towards establishment of national adaptation strategies, capacity building, facilitating the transfer of tools and technologies, information provision and awareness. The UNFCCC could also play a more active role in reaching out to communities of practice beyond the climate change community.

- ***BASIC Sao Paulo proposal***

The proposal suggests the following components of an adaptation agreement:

- Creation of an Adaptation Committee of Experts to provide advice to the COP/MOP and other Protocol bodies on adaptation activities and funding, act as a focal point for institutional and policy linkages with international and national bodies charged with achievement of MDGs and with disaster risk reduction; Will also develop tools and techniques to assess vulnerability and adaptation options for human populations and natural ecosystems.
- Launching a 5 year pilot phase of Adaptation Activities Implemented Cooperatively. The objective of the pilot phase is to catalyse rapid learning about adaptation "good practices" by supporting demonstration projects, programmes and policies in vulnerable countries.
- First stage of the pilot phase focusing on reviewing and revising design parameters and standards for infrastructure and equipment, with a review process of this phase by the Adaptation Committee of Experts envisaged for 2012.
- Assessing insurance and other risk management mechanisms to address extreme weather. Adopting a new legal instrument for the implementation of this mechanism not later than the end of 2012.
- Continue supporting the Adaptation fund by the 2% share of the proceeds on CERs and supplement it by a similar levy on VERs and a share of the funding from Annex I/B Parties financial commitments events.

- *Dialogue on Future International Actions (CCAP) proposal*¹⁰

Adaptation is one of the 7 critical elements of a post-2012 package proposed by the CCAP. The key elements of the adaptation component are:

- Applied scientific information on impacts at a resolution and temporal scale useful to decision-makers to assess vulnerability.
- Clear definition of eligible activities, including climate-proofing of existing investments and new stand-alone adaptation actions.
- A substantial funding mechanism tapping public and private sources – could involve extension of the CDM levy to AAUs, new fees on aviation and maritime emissions, auction revenues, or new ODA resources.
- Rationalisation or sorting out of roles for overlapping UN agencies – can the UNFCCC stimulate such a process?
- A pilot phase of adaptation projects.
- A framework for prioritising adaptation activities between countries and sectors.

In addition to the proposals presented above, there were earlier proposals (in 2003-2004) on adaptation in a post-2012 agreement. These earlier proposals focused on funding for adaptation and suggested either frameworks for developed countries to provide additional funding to developing countries to compensate them for climate change-related damages or frameworks for mainstreaming adaptation into development. The newer proposals outlined above include similar ideas and expand on them and other issues further.

Table 1 below provides a brief summary of the six proposals presented in this section and allows for a quick comparison of these proposals. All of these proposals provide a useful contribution to the discussion on adaptation. However, they are not always linked to a possible framework on adaptation under the UNFCCC. In addition, many of these proposals put additional emphasis on funding options, while examining the same financial resources that are also proposed for addressing emissions from deforestation or for generating additional GHG emission reductions in developing countries. While several proposals suggest new institutional structures within the Secretariat to lead the work on adaptation, many other components of an agreement on adaptation still need to be addressed.

In addition to the proposals by organisations, South Africa outlined its proposal for a 360 degree outlook for adaptation at the third workshop of the Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention. This proposal suggests an approach that would include adaptation through mainstreaming and stand-alone adaptation actions. It also suggests creating a special body within the UNFCCC (e.g., Adaptation Committee of Expert) to increase adaptation profile in the UNFCCC and perform coordinating and advising/consulting roles.

¹⁰ Based on the discussions at the Dialogue on Future International Actions to Address Global Climate Change (July 2007)

Table 1. Comparison of proposed schemes for addressing adaptation in a post 2012 climate agreement

	Pew Center	European Climate Platform	Toward a Post-2012 Climate Change Regime	IISD Canadian proposal	BASIC San Paolo proposal	Dialogue on Future International Actions (CCAP)
Funding options	<ul style="list-style-type: none"> >GEF (under the UNFCCC). >Levy on carbon market (under the UNFCCC). >ODA (outside the UNFCCC). >Climate insurance (outside the UNFCCC). 	<ul style="list-style-type: none"> >Create/expand a new centralized fund and local autonomous adaptation funds. >A levy on carbon market. >ODA. >Insurance. 	<ul style="list-style-type: none"> >PPP – a GHG levy for adaptation differentiated by 3 groups of countries. Insurance. 	<ul style="list-style-type: none"> >Disaster relief funds. >Innovative market mechanism (e.g., a carbon- or fossil fuel levy, levy on GHG emissions, levy on air travel, international air travel adaptation fund, currency transaction development levy). >Development funds. 	<ul style="list-style-type: none"> >Adaptation fund: levy on CDM plus on VERs. >Legal framework for Insurance mechanisms. 	<ul style="list-style-type: none"> >Extension of CDM levy to AAUs. >New fees on aviation and maritime emissions, auction revenues. >ODA.
Institutional arrangements within the UNFCCC	Technical body to advice on adaptation.		A separate legal instrument on adaptation under the Convention.		Adaptation Committee of Experts.	
Eligible activities	<ul style="list-style-type: none"> >National adaptation strategies. >High priority projects (priority to sea-level rise or glacial melting). 	Both >adaptation measures and >efforts to enhance adaptive capacity.	>Projects identified by NAPAs.	5 types of adaptation actions: <ol style="list-style-type: none"> 1) national adaptation strategies. 2) governance. 3) technologies. 4) information. 5) implementation at local and sectoral levels. 	<ul style="list-style-type: none"> >Demonstration projects and policies in vulnerable countries; >Standards for infrastructure. 	
Process	<ul style="list-style-type: none"> >UNFCCC: NAPAs, high priority projects. >Integration with development (ODA). >Insurance. 		(Within the UNFCCC) agree on <ol style="list-style-type: none"> 1) scope of adaptation; 2) country groupings according to their adaptive capacity and expected impacts. 	<ul style="list-style-type: none"> >Role of the UNFCCC is to 1) direct funds into 5 types of adaptation actions, 2) reach out beyond climate community. >A Climate-wise Development Treaty outside the UNFCCC. 	<ul style="list-style-type: none"> >5 year pilot phase “Adaptation Activities Implemented Cooperatively”. >First stage: review and redesign of standards for infrastructure and equipment. 	<ul style="list-style-type: none"> >Pilot phase. >Framework of priorities. >Roles of the UN institutions. >Need to define eligible activities.

Source: Author's summary

4. Adaptation to climate change in other international fora

The UNFCCC and the Kyoto protocol is not a single place where adaptation is considered. Adaptation has been brought into the discussions in international environmental agreements (such as Convention on Biological Diversity, Convention to Combat Desertification, Convention on Sustainable Development); in the context of international development agenda (including MDGs, bilateral and multilateral ODA); and in other multilateral fora (including ISDR, Arctic Council and G8).

4.1 International environmental agreements

- *Convention on Biodiversity*

Convention on Biological Diversity was adopted in 1992. The main objectives of this Convention are the conservation of biological diversity, the sustainable use of its components and the equitable sharing of the benefits from the use of biodiversity resources. Biological diversity includes all plants, animals, microorganisms, the ecosystems of which they are part, and the diversity within species, between species, and of ecosystems (UNCBD, 2003). Since 1991, the GEF has invested nearly USD 7.6 billion in grants and co-financing for biodiversity conservation in developing countries.

The conservation and sustainable use of biodiversity can provide opportunities for adaptation and is an adaptation option itself. The conservation of biodiversity and maintenance of ecosystem structure and function are important climate change adaptation strategies because genetically-diverse populations and species-rich ecosystems have a greater potential to adapt to climate change. Protected ecosystems will also provide important goods and services to communities and constitute important adaptation measures for the society. For example, the protection or restoration of mangroves can offer increased protection of coastal areas to sea level rise and extreme weather events. The rehabilitation of upland forests and wetlands can help regulate the flow in watersheds, thereby moderating floods from heavy rain and ameliorating water quality. Biodiversity resources, such as land races of common crops, resistant coral varieties, and medicinal plants can also reduce the vulnerability of key sectors including agriculture, fisheries and health.

There are also adaptation activities that can threaten biodiversity either directly – through the destruction of habitats, e.g., building sea walls, thus affecting coastal ecosystems, or indirectly – through the introduction of new species or changing management practices.

In recognition of the above-mentioned benefits and threats, climate change activities have been integrated within all programmes of work of the CBD with the exception of the programme of work on technology transfer. Furthermore, Parties to the CBD have called for the enhanced integration of climate change impact and response activities within the Convention. There is a clear opportunity to implement mutually beneficial activities that take advantage of the synergies between the UNFCCC and the Convention on Biological Diversity. In particular, Parties to the CBD have repeatedly called for enhanced synergies between the two Conventions through the cross-cutting initiative on biodiversity and climate change. However, these opportunities are rarely realised due to the lack of national coordination among sectoral agencies and national plans, but also due to the lack of coordination among relevant international agreements and processes.

There have been several initiatives under the UNCBD to coordinate activities that have synergies between the UNFCCC actions on adaptation and the UNCBD. A special Ad hoc Technical Expert Group on Biological Diversity and Climate Change under the Convention on Biological Diversity¹¹ has developed a document “Advice on the Integration of Biodiversity Considerations into the Implementation of the UNFCCC and its Kyoto Protocol”. The document suggests the use of environmental impact

¹¹ Ad Hoc Technical Expert Group on Biodiversity and Climate Change (UNEP/CBD/SBSTTA/9/11 and UNEP/CBD/SBSTTA/9/INF/12)

assessments (EIA) and strategic environmental assessment (SEA) for evaluating impacts of mitigation and adaptation activities on biodiversity. The document also provides lessons learned from case studies on synergies between mitigation, adaptation and biodiversity. The Group has also developed another document titled “Integration of Biodiversity Considerations in the Implementation of Adaptation Activities to Climate Change at the Local, Sub national, National, Sub regional and International Levels”. The group also produced two technical series: Technical Series No. 10 - Interlinkages between biological diversity and climate change and Technical Series No. 25 - Guidance for Promoting Synergy Among Activities Addressing Biological Diversity, Desertification, Land Degradation and Climate Change.

In 2005, a practical guidance on the risk assessment and management approach to evaluating links between adaptation and biodiversity was developed under the framework of the UNCBD. An illustrative table is provided in Annex II.

The ecosystem approach of the Convention on Biological Diversity, which for example includes integrated coastal zone management, provides a flexible and participatory management framework to address climate change mitigation and adaptation activities in a broad perspective. For example, agroforestry systems have a substantial potential to sequester carbon and can reduce soil erosion, moderate climate extremes on crops, improve water quality, and provide goods and services, including livelihood opportunities, to local people.

The examination of available NAPAs has demonstrated that there are many proposed priority adaptation projects that simultaneously address biodiversity concerns (see Table 2). There are also proposed adaptation projects that may have negative impacts on biodiversity. The following table lists only those priority adaptation projects that supposedly have positive impacts on biodiversity and could also be included in national programmes on biodiversity.

Table 2 Adaptation activities listed in NAPAs relevant to biodiversity

Country	Priority adaptation projects
Bangladesh	<ul style="list-style-type: none"> ➤ Reduction of climate change hazards through coastal afforestation with community participation. ➤ Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change.
Bhutan	<ul style="list-style-type: none"> ➤ Promote community-based forest fire management and prevention.
Burundi	<ul style="list-style-type: none"> ➤ Rehabilitation of degraded areas. ➤ Safeguarding the most vulnerable natural environments.
Cambodia	<ul style="list-style-type: none"> ➤ Community mangrove restoration and sustainable use of natural resources. ➤ Community agroforestry in coastal areas. ➤ Community agroforestry in deforested watersheds.
Comoros	<ul style="list-style-type: none"> ➤ Defence and restoration of degraded soils.
Djibouti	<ul style="list-style-type: none"> ➤ Preserve forest eco-systems. ➤ Restore pastures in order to reduce vulnerability to climate change. ➤ Restore coastal mangroves.
Eritrea	<ul style="list-style-type: none"> ➤ Encourage afforestation and agroforestry through community forestry initiative.
Haiti	<ul style="list-style-type: none"> ➤ Several soil conservation projects. ➤ Several coastal zone protection projects. ➤ Reforestation and forest protection projects. ➤ Two projects on natural resources protection.
Kiribati	<ul style="list-style-type: none"> ➤ Coastal reef restoration, monitoring and stock enhancement.
Lesotho	<ul style="list-style-type: none"> ➤ Management and reclamation of degraded and eroded land in the flood prone areas (pilot project for western lowlands). ➤ Conservation and rehabilitation of degraded wetlands in the mountains areas of Lesotho.
Malawi	<ul style="list-style-type: none"> ➤ Restoring forests in the Shire River Basin to reduce siltation and the associated water flow problems.
Mauritania	<ul style="list-style-type: none"> ➤ Participatory reforestation for energy and agroforestry in agricultural zones. ➤ Preservation of the diversity of the fish population. ➤ Restoration and integrated management of the lowlands and wetlands. ➤ Improvement of knowledge about, and sustainable management of, forest resources. ➤ Institutional reinforcement of the structure responsible for nature conservation.
Niger	<ul style="list-style-type: none"> ➤ Improving anti-erosion activities (CES/DRS) for agricultural, forestry and pastoral purposes. ➤ Protecting riversides and restoring silted up ponds.
Samoa	<ul style="list-style-type: none"> ➤ Reforestation, rehabilitation and community forestry fire prevention. ➤ Establishing conservation programs in high vulnerability marine and terrestrial areas of communities.
Senegal	<ul style="list-style-type: none"> ➤ Development of agroforestry ➤ Protection of coasts.

Source: Author's summary based on available NAPAs

Table 2 shows that many priority adaptation actions identified by the LDCs in their NAPAs also address the goals of the Convention on Biological Diversity. Examples of such actions include community agroforestry (Cambodia, Mauritania, Senegal), forest, mangrove and wetlands protection (Cambodia, Djibouti, Lesotho, Malawi, Mauritania, Samoa), ecosystem conservation programmes (Kiribati, Samoa, Senegal). Among the National Biodiversity Strategy and Actions Plans (NBSAP) of the CBD, an initial review reveals that 25 countries (representing 18% of the NBSAPs submitted) address climate change to

some extent with one country (Australia) having developed a national biodiversity and climate change action plan. As such, there is an opportunity and scope for enhanced harmonization between NBSAPs and NAPAs.

If provisions of the Convention on Biological Diversity to protect forests, mangroves, wetlands and watersheds were complied with in every country-signatory to this Convention, if an ecosystem approach to natural resources managements was effectively used everywhere, many countries would be much less vulnerable to the impacts of climate change.

- ***Convention on Desertification***

The Convention to Combat Desertification (UNCCD) was adopted in 1994. The aim of the Convention is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa. Climate variability together with human activities, such as over-exploitation and inappropriate land use are recognised as main causes of land degradation and desertification. The problems of desertification have recently been aggravated by increasing occurrence of extreme climate events, such as droughts and floods.

Article 8 of the UNCCD calls for cooperation with other conventions, “particularly the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity, in order to derive maximum benefit from activities under each agreement while avoiding duplication of effort. The Parties shall encourage the conduct of joint programmes, particularly in the fields of research, training, systematic observation and information collection and exchange, to the extent that such activities may contribute to achieving the objectives of the agreements concerned.”

National action programmes are used as an instrument of implementing the Convention. “Affected country Parties shall consult and cooperate to prepare, as appropriate, in accordance with relevant regional implementation annexes, subregional and/or regional action programmes to harmonise, complement and increase the efficiency of national programmes”.

In 2006 the Secretariat of this Convention together with WMO organised an international workshop on climate and land degradation. The workshop concluded that the increasing occurrence of climate extremes is having an impact on land degradation process. Among the workshop recommendations, several are directly relevant to adaptation to climate change, they are the following¹² :

- strengthen the knowledge and understanding of climate and functions of ecosystems;
- identify and implement innovative and adaptive land management responses to climate change and natural hazards;
- improve rainfall use in land management practices in drought-prone areas;
- communicate climate forecasts to stakeholders, in particular to farmers;
- develop and implement national drought policy.

In 2003, the GEF was designated a financial mechanism of the United Nations Convention to Combat Desertification. It is expected that between 2007 and 2010 GEF will invest more than USD 250 million in projects that integrate sustainable land management into national development priorities, strengthen human, technical, and institutional capacities, bring about needed policy and regulatory reforms, and implement innovative sustainable land management practices¹³. So far the GEF has approved 45 projects that address land degradation through ecosystem management, agriculture and water-shed related projects, and capacity building, with a total budget of about USD 355 million with more than USD 2 billion in co-financing.

¹² CCD/COP8/CST/8 10 July 2007

¹³ http://www.gefweb.org/interior.aspx?id=240&ekmense1=c580fa7b_48_130_btnlink

Similar to the Convention on Biological Diversity, Convention on Desertification has tight links with the adaptation component of the UNFCCC. Many actions in drought-prone countries to address problems of land degradation could also be included in the list of adaptation actions.

4.2 International development agenda

- *MDGs*

In 2000, the international community agreed on a Millennium Declaration which specified eight goals for international development¹⁴. The deadline for fulfilling these commitments was set for 2015. While adaptation to climate change is not explicitly referred to in the Millennium Declaration and is not featured in any of the eight Millennium Development Goals, achievement of the MDGs will contribute to adaptive capacity and adaptation. Climate change impacts, on the other hand, have the ability to impede implementation of MDGs. Given the approaching timeframe for achievement of MDGs, it is essential to provide sufficient resources so that the goals are met on time. It is especially critical and urgent since the lack of development also contributes to countries' vulnerability to climate change. Meeting MDGs on time will not only provide the expected development benefit, but will also facilitate development of adaptive capacity for coping with climate change impacts.

Some of the eighteen targets within the MDGs have higher level of relevance to adaptive capacity and adaptation than others. Those most relevant to adaptive capacity and adaptation are highlighted in Table 4, below:

¹⁴ The Millennium Development Goals are Goal 1: Eradicate extreme poverty and hunger; Goal 2: Achieve universal primary education; Goal 3: Promote gender equality and empower women; Goal 4: Reduce child mortality; Goal 5: Improve maternal health; Goal 6: Combat HIV/AIDS, malaria, and other diseases; Goal 7: Ensure environmental sustainability; Goal 8: Develop a global partnership for development.

Table 3: Selected MDG targets and their relevance to adaptation and adaptive capacity

Target	Text	Adaptive capacity	Adaptation
Target 1	Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day	x	
Target 2	Halve, between 1990 and 2012, the proportion of people who suffer from hunger	x	x
Target 3	Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling	x	
Target 7	Have halted by 2015 and begun to reverse the spread of HIV/AIDS	x	
Target 8	Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases	x	x
Target 9	Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources	x	x
Target 10	Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation	x	x
Target 11	By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers	x	x
Target 12	Develop further an open, rule-based, predictable, non-discriminatory trading and financial systems	x	
Target 13	Address the special needs of the least developed countries	x	x
Target 14	Address the special needs of landlocked developing countries and small island developing states	x	x
Target 17	In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries	x	
Target 18	In cooperation with the private sector, make available the benefits of new technologies, especially information and communication	x	x

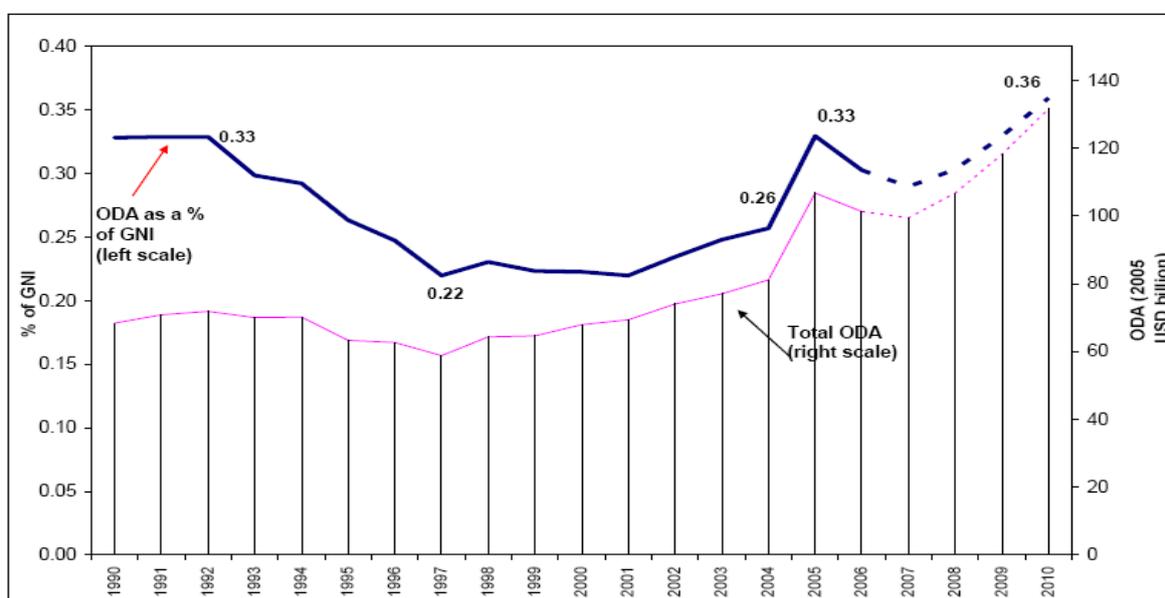
Source: Author's assessment.

Reducing poverty (target 1), providing general education (target 3) and health services (target 7 and target 17) to communities, improving general living conditions of urban settlements (target 11), providing access to financing and markets (target 12) and technologies (target 18) will improve livelihoods of local communities (rural and urban), and improve their abilities to engage in adaptive actions and behaviour. Actions by donors and national governments of host countries to address hunger caused by droughts and floods (target 2), to provide access to water and sanitation (target 10), and to prevent and treat malaria (target 8) will also constitute adaptation actions if they are implemented with information on climate change in mind. Integrating policies on sustainable development and efficient use of environmental resources into national policies (target 9) will also facilitate adaptation to climate

change. Achieving a high degree of access to information and communications technologies (target 18) could either be an important prerequisite for adaptation or an adaptation measure in itself since information and communications are an essential tool of adaptation in general and risk prevention, mitigation and response strategies in particular.

There are no explicit financial commitments for every MDG or Target. Donor governments have agreed to boost their aid and dedicate up to 0.7% of gross national income (GNI) to aid activities. However, this communal target has never been reached. While the total aid has been increasing since 2000 up to last year (Figure 1), the share of aid in GNI has peaked at only 0.33% in 2005. According to the Millennium Development Goals Report of 2007, some progress has been made in achieving the MDGs, even in those regions where challenges are the greatest. However, the results among countries, regions and Goals are uneven. According to the report, several developing countries are demonstrating that “rapid and large-scale progress towards MDGs is possible”. In particular, impressive results have been achieved in sub-Saharan Africa in areas such as raising agriculture productivity, controlling malaria, widening access to basic rural health services, reforesting areas on a large scale, and increasing access to water and sanitation.

Figure 1 DAC Members' Net ODA 1990 - 2006 and DAC Secretariat Simulations of Net ODA to 2010



Source: OECD, April 2007.

The experience shows that achievement of MDGs is possible when national governments in developing countries provide strong leadership and develop appropriate policies and strategies, and when adequate financial and technical support is provided by the international community.

- **Official Development Assistance (ODA)**

It has been recognised that a big share of development assistance projects is sensitive to climate change impacts (Agrawala, OECD, 2005). However, it is also important to acknowledge that a big share of ODA goes into projects and activities that may contribute to building adaptive capacity and to facilitating adaptation. A rough analysis of the categories of ODA activities reported by the OECD DAC countries under the OECD CRS database demonstrates that more than 60% of all ODA could be relevant to adaptive capacity and adaptation. See Table 5 and Annex I¹⁵ for the details of this analysis. The assumption for this analysis was that many ODA activities reported under such categories as education,

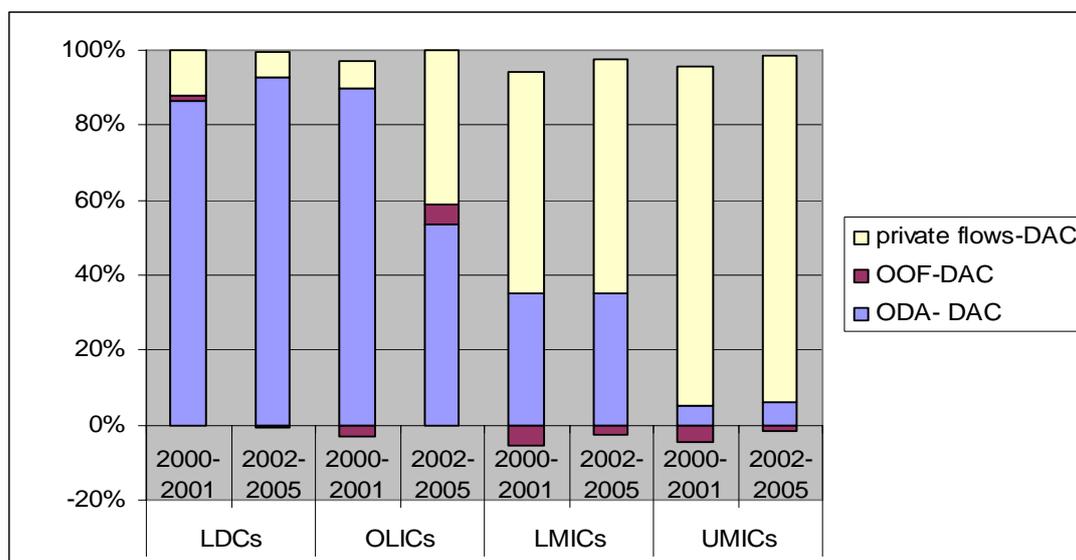
¹⁵ Annex I to this report provides a full list of OECD CRS database categories; these categories were marked as sensitive to climate change or contributing to adaptation for the purposes

health, water resources management, governance, infrastructure, transport, energy, financing mechanisms, agriculture, forestry, fisheries, construction, industrial policies, environment, urban and rural development, and emergency assistance and reconstruction could be relevant for adaptation. Activities that could either be affected by climate change impacts or contribute to climate change vulnerability and/or resilience were included as relevant to adaptation. All these activities will have to take adaptation to climate change into account.

As Figure 2 below shows, ODA constitutes about 90% of all foreign flows into LDCs, while the share of private flows increases dramatically to developing countries of middle and high income. Thus, the role of ODA in building adaptive capacity and facilitating adaptation in LDCs could be significant.

It has been recognised that mainstreaming of adaptation into national and sectoral policies offers a cost-effective approach to adaptation. However, mainstreaming of adaptation into development assistance raises concerns with developing countries. Many developing countries are worried that the same financial flows will simply be diverted from ongoing development activities to adaptation efforts. However, it should be acknowledged that in some cases the same development objectives can be met while making this development more climate-resilient. Taking adaptation concerns into consideration can help to “climate-proof” development assistance to provide for longer lasting benefits from development assistance projects. It is safe to assume that mainstreaming adaptation into national policies, ODA and private sector activities will require additional funds to satisfy new requirements and considerations. How much these additional costs will be is not known, neither where the financial resources will come from. On the other hand, it is also possible to imagine that in some cases, changing practices will require rearrangement of resources within the scope of the same assistance project but will not always require additional (in absolute terms) financial resources.

Figure 2 Financial flows into developing countries from OECD countries



Source: OECD DAC database

Note: LDCs – Least developed Countries; OLIC – Other Low Income Countries; LMIC – Lower Middle Income Countries; UMIC – Upper Middle Income Countries; OOF – Other Official Flows

Following the OECD conclusion that about 30-40% of ODA is sensitive to climate risks (Agrawala, OECD, 2005), the OECD Environment and Development Co-operation Ministers signed the OECD Declaration on Integrating Climate Change Adaptation into Development Co-operation in April 2006 to highlight the importance of integrating climate change adaptation into development cooperation projects and programmes. As a follow up to the Declaration, the OECD is developing guidelines for bilateral donors on integrating adaptation into ODA.

Table 4: ODA sensitive to climate change and ODA potentially relevant for adaptation
(USD billion)

Year		2000	2001	2002	2003	2004	2005
ODA Total	All developing countries (all sectors)	56,436.5	55,364.3	64,779.1	90,568.2	98,347.9	121,725.6
ODA relevant to adaptation	ODA into Sectors potentially relevant to adaptation	36,401.4	36,607.6	41,636.2	52,453.6	64,091.7	71,643.2
	Share of ODA potentially relevant to adaptation	64%	66%	64%	58%	65%	59%
ODA sensitive to climate change	ODA into Sectors sensitive to climate change	22,556.49	22,325.27	22,743.63	27,295.16	31,420.00	41,089.39
	Share of ODA into sectors sensitive to climate change	40%	40%	35%	30%	32%	34%

Source: OECD DAC CSR database and author's analysis (see Annex I for the categories included).

Note: ODA figures in this table represent ODA commitments rather than actual disbursements (however, the share of ODA potentially relevant to adaptation would probably be the same if ODA disbursement numbers were taken).

The OECD has also developed a report that documents progress on integrating climate change adaptation concerns into development assistance activities by bilateral and multilateral donors. The report, entitled "Stocktaking of Progress on Integrating Adaptation to Climate Change into Development Co-operation Activities" concludes that the past five years have witnessed a significant, even dramatic, increase in the degree of attention to the risks of climate change within the context of development co-operation activities. The report highlights that the most progress in integrating adaptation into development projects has been achieved in two areas: the development of tools to screen development investments for climate risks, and the identification of entry points to integrate climate considerations in development co-operation activities. However, the report also concludes that much of the progress thus far has been at the level of high-level policy declarations or efforts initiated by climate specialists in the headquarters of certain donor agencies and IFIs. "Actual implementation (via pilot projects) is still at an early stage or absent altogether", (OECD, 2007).

4.3 Other multilateral fora

- *International Strategy for Disaster Risk Reduction*

Following the International Decade for Natural Disaster Reduction (IDNDR) which ran from 1990 to 1999, the UN General Assembly established the International Strategy for Disaster Reduction (ISDR) in 2000. The ISDR was established as a centrepiece of the United Nations efforts to address the causes of disasters, which continue to devastate and impede the development of many countries. One of the four Working Groups under the ISDR Inter-Agency Task Force on Disaster Reduction is on Climate and Disasters, chaired by the WMO.

Disaster risk reduction is one of the main tools of adaptation to climate change. Activities related to preventing and managing disasters caused by hydro-meteorological events fall under both agendas, that

of the ISDR and the UNFCCC. Disaster reduction, and a number of activities carried out within the framework of the ISDR, remain highly relevant to climate change and the work of the UNFCCC. The experience of countries in managing current climate fluctuations and extremes can provide valuable lessons for dealing with projected longer term changes. Disaster reduction, therefore, provides a solid, meaningful, no-regrets set of activities in support of climate change adaptation plans.

Areas where the ISDR Secretariat's work would be relevant to the activities within the UNFCCC relate to (UNFCCC SBSTA, 20th session, 2003):

- identification, assessment and monitoring of risks and vulnerability;
- community based disaster risk management and local coping strategies;
- natural resources and environmental management and risk reduction.

For example, early warning, a known tool of disaster reduction, has the potential to contribute significantly to reducing current and future disaster losses from climate change. Studies have shown that a USD 1 expenditure on risk mitigation saves about USD 4-10 in recovery costs (Vordzorgbe, 2003). Countries are developing early warning systems as part of integrated adaptation strategies. Annex I countries are further along in developing and using early warning systems. Among developing countries Caribbean, Latin American and Pacific countries have progressed along this track further than Africa and Asian countries (UN, 2006).

Several LDCs have identified disaster management-related activities as their priority urgent adaptation needs in their NAPAs. Examples of such activities are presented below in Table 5.

Table 5 Adaptation activities listed in NAPAs relevant to disaster risk reduction

Country	Disaster management related adaptation activities
Bangladesh	<ul style="list-style-type: none"> ➤ Reduction of climate change hazards through Coastal afforestation ➤ Climate change and adaptation information dissemination to vulnerable community for emergency preparedness measures ➤ Construction of flood shelter, and information and assistance centre ➤ Mainstreaming adaptation to climate change into policies and programmes in different sectors, focusing on disaster management
Bhutan	<ul style="list-style-type: none"> ➤ Disaster Management Strategy – planning for food security and emergency medicine to vulnerable communities ➤ Weather Forecasting System to serve farmers and agriculture ➤ Landslide management and flood prevention ➤ Hazard zoning ➤ Installation of early warning system on Pho Chu basin
Burundi	<ul style="list-style-type: none"> ➤ Improvement of seasonal early warning climate forecasts
Cambodia	<ul style="list-style-type: none"> ➤ Strengthening Community Disaster preparedness and response capacity ➤ Vegetation planting for flood and wind storms protection ➤ Community mangrove restoration and sustainable use of natural resources.
Comoros	<ul style="list-style-type: none"> ➤ Early warning
Lesotho	<ul style="list-style-type: none"> ➤ Improvement of early warning Systems for climate induced disasters and hazards
Malawi	<ul style="list-style-type: none"> ➤ Developing and implementing strategies for drought preparedness, flood zoning and risk mitigation works
Niger	<ul style="list-style-type: none"> ➤ Food banks
Rwanda	<ul style="list-style-type: none"> ➤ Set up information systems of hydro agro-meteorological early warning system
Samoa	<ul style="list-style-type: none"> ➤ Climate early warning system ➤ Zoning, disaster management

Source: Author's summary based on available NAPAs¹⁶

As Table 5 above shows, many priority adaptation actions, such as setting up early warning systems for floods and droughts, developing disaster management strategies, developing drought preparedness strategies, hazard mapping and zoning, and others are directly relevant to disaster risk reduction.

Similar activities are implemented and funded through the ISDR. The ISDR budget of the 2006-2007 work programme activities (including disaster management policy & interagency coordination, public awareness, information clearinghouse, regional outreach, monitoring & resource mobilization) was about USD 4,5 million (ISDR, 2006). To mobilize additional resources and assist countries in building capacities at the local and national levels to disaster proof the MDGs, the World Bank in consultation with different stakeholders approved a new partnership, the Global Facility for Disaster Reduction and Recovery (GFDRR) in 2006. The estimated programme size for the period 2006-2016 for all activities is USD 2 billion (Praveen Pardeshi, 2006).

The World Bank's Global Hotspot Study has identified 85 countries with high mortality and economic loss risks from disasters, with 30-95% of GDP and/or mortality in areas with risk, (see Annex III for the list of eligible countries). The Global Facility for Disaster Reduction and Recovery will assist these countries with mainstreaming hazard risk management in development strategies. The facility will enable and accelerate the implementation of the Hyogo Framework of Action in the World Bank's low and middle-income high-risk client countries (World Bank, 2007).

4.4 Summary and conclusions of this section

What is evident from the analysis in Sections 4.1 to 4.3 is that numerous activities under other international agendas also address adaptation to climate change. If sufficient financial resources were provided and implementation of other international agreements (such as MDGs, the Conventions on biodiversity and desertification, International Strategy for Disaster Reduction) was made a priority for national agendas, the scope of work for adaptation (including adaptive capacity building) under the UNFCCC would be more limited.

The conclusion from this section is that some aspects of adaptation are already being addressed, but the level of efforts is not adequate. Climate change adds urgency and yet another reason or incentive (in order to reduce damage and other impacts from climate change) to implement the existing agreements and commitments.

- The question that policy makers need to answer is whether repeating the same statements and commitments in a new international agreement is what is needed to mobilise resources for implementation.
- As illustrated in this section, there are many activities that have to be happening (and that are happening to a certain extent) under other international agreements that also have additional benefits for adaptation to climate change. Should such activities be included in a new climate change agreement to secure additional funding? If the implementation of these activities has to happen any way according to the existing commitments and international agreements, will an added benefit of adaptation justify them as additional for new and dedicated financial resources for adaptation under the climate agreement? Or are there other ways to mobilise resources for their implementation?
- What role should the UNFCCC play in assisting Parties in focusing on those adaptation activities in the first place that have synergies with other agendas? Or should the UNFCCC focus on those adaptation actions that are likely not be covered by other international agreements?

¹⁶ www.unfccc.org

5. Ideas for the Way Ahead

This section examines several key factors that could be considered by an international agreement on adaptation under the UNFCCC:

- a) *Scope of activities to be included and roles of the UNFCCC*
- b) *Specific goals of adaptation to be addressed*
- c) *Indicators/ metrics to measure progress on adaptation*
- d) *Reporting and review*
- e) *Policies and measures to mobilise adaptation actions, including funding mechanisms*
- f) *Responsibilities of the Parties*

5.1 Scope of activities to be included in a post-2012 agreement

Defining the scope of activities is one of the first key steps that would allow setting a concrete framework for an agreement on adaptation. The range of activities that the Parties imply in their statements on adaptation and that have been considered by various proposals on adaptation in a post-2012 agreement is very broad. It extends from a limited scope of projects identified by NAPAs (e.g., proposed by Pew Center) to a broader scope encompassing mainstreaming and stand alone adaptation actions, (for example, a 360 degree approach proposed by South Africa).

There is a wide range of options that can be envisaged for a scope of adaptation activities under the UNFCCC. An agreement on scope will also depend on a role assigned to the UNFCCC by the Parties. Recognising local nature of most adaptation actions and numerous frameworks (international and domestic) that could facilitate adaptation, it would be practical to expect a catalytic role of the UNFCCC in adaptation process. The spectrum of possible options of the scope ranges from a narrow focus on adaptation activities related to explicit impacts of climate change (e.g., sea level rise, permafrost and glacier melting, more frequent and/or severe extreme events) to a much broader array of actions including current spectrum of activities (including the work of SBI and SBSTA on adaptation and activities stemming from COP decisions).

Recognising a wide range of activities relevant to adaptation occurring under other international fora (see section 4 for a detailed analysis), a more limited scope of adaptation activities under the UNFCCC could be proposed. Such an approach would allow containing the issues into manageable areas of activities. However, it does not reflect the multi-sectoral nature of impacts, and that the most efficient adaptation may be achieved by working across impacts. It also does not reflect the potentially problematic issue of determining which impacts are the explicit results of climate change, which may be particularly problematic for extreme events.

Thus, the inclusion of a broader scope of adaptation activities would seem more appropriate. The future agreement could be based on the current scope of activities and responsibilities with a gradual increase in the level of efforts (e.g., more countries conduct a NAPA-type exercise of prioritising adaptation actions, more projects identified by NAPAs are implemented, more countries (Annex I and NAI) launch their national efforts on adaptation, etc.).

The list of activities would resemble the scope of activities agreed on by the UNFCCC and the Kyoto Protocol and could also be expended:

- *All Parties* report on vulnerability and adaptation under National Communications;
- *All Parties* develop and implement national actions plans on adaptation (clear commitments could be added);
- *LDCs and other agreed groups* of countries develop NAPAs (financial support is provided by Annex I Parties through the GEF);

- Efforts on implementation of the NAPA projects are scaled up (financial support by the Annex I Parties is increased);
- *NAI Parties* participate in and benefit from capacity building activities;
- *All Parties* participate in and benefit from information sharing;
- Adaptation Fund is replenished with the share of proceeds from the CDM market;
- *Developing countries* are assisted with adaptation (in addition to NAPA projects funded by the LDCF) through the SCCF and Adaptation Fund with a gradual increase of financial commitment by the Annex I Parties;
- *All Parties* benefit from methodological and analytical work that is being developed in the course of implementation of adaptation agenda under SBSTA and SBI, and from sharing of experiences on adaptation;
- *All Parties* benefit from coordination of the UNFCCC with two other Rio conventions and with the ISDR.

In addition, *Parties* may agree to improve guidelines for National Communications, so that reporting on vulnerability and adaptation by *all countries* would include prioritisation of adaptation actions (similar to the NAPA process). *Developed country Parties* may also agree to report on how they integrate information on climate change and adaptation into their development assistance projects (something that the OECD donor countries have committed to doing by the OECD “Declaration on Integrating Climate Change Adaptation in Development Co-operation” from April 2006).

All Parties may also agree to coordinate at the national level their actions that have synergies for biodiversity, disaster risk reduction, land degradation, development and adaptation to climate change.

Recognising synergies between adaptation actions and actions under other relevant agreements, and acknowledging inadequate level of funding and other constraints for achieving goals set by those other relevant agreements, priority could be given to those adaptation projects that can demonstrate these synergies.

As was discussed in Section 4, numerous activities that are directed at implementing conventions on biodiversity and desertification, the MDGs and the ISDR could also constitute adaptation measures. At the national level it would be cost-effective to implement projects that have multiple synergies. At the international level, a mechanism is needed that would facilitate coordination of such activities at the national level and provide incentives for this coordination. Several options for such coordination were discussed at the UNFCCC workshop on adaptation practices in Rome¹⁷, including coordination of national focal points for the concerned conventions, coordination at the level of chairs of SBSTA and SBI for all concerned conventions, and/or reporting of UNCBD, UNCD, and ISDR to the UNFCCC on a regular basis.

In addition to international forums that have capacity to encompass adaptation, there are also various international organisations, including UN bodies such as WMO, WHO, FAO, and others, whose mandates and sector-specific and/or regional focus allows them to be well positioned for designing and implementing adaptation policies at sectoral and/or certain geographic levels. These organisations play an important role in bringing international policies and approaches down to local levels. With strategic guidance from the UNFCCC and by contributing to the UNFCCC’s methodological work on adaptation, these organisations could be significant players on adaptation at the international and national levels.

Since activities related to adaptation elsewhere are under funded and progress is very slow, the UNFCCC may decide to play a stronger role in catalysing and coordinating all major avenues of adaptation. Given the momentum on climate change and adaptation, it is possible to envisage that stronger commitments on adaptation could be negotiated. This will lead to the expansion of the scope of activities under the adaptation agreement to include a wide range of activities that contribute to building adaptive capacity, and to include coordination with other relevant international agreements and organisations.

¹⁷ UNFCCC workshop on adaptation planning and practices under the NWP, Rome 10-12 September 2007.

5.2 Role of the UNFCCC

There are several roles that UNFCCC already plays and can continue to play in adaptation process. Additional or stronger roles could be identified based on the recommendations provided by Parties at regional workshops and expert meeting on adaptation under decision 1/CP.10 (FCCC/SBI/2007/14). The Parties identified access to financial resources, mainstreaming of adaptation, insurance, capacity building, education, training and public awareness, cooperation and synergies as well as technical and methodological issues (under consideration by the Nairobi Work Programme) as the key areas where additional efforts are needed. Based on this recommendations and current roles of the UNFCCC, the following roles could be envisaged for the UNFCCC in the future agreement on adaptation:

- Catalyst of adaptation actions at national and international levels through:
 - Requirements of national adaptation strategies and policies
 - Strategic guidance on vulnerability and adaptation
 - Development of tools, methodologies on how to assess risks and mainstream adaptation
 - Setting best practices, “standards” on adaptation
 - Identifying and requesting financial resources and providing guidance on how to distribute them
- Coordinator of adaptation-relevant activities at the international level through
 - Establishment of formal links with the Convention on Biodiversity and the Convention on Desertification (e.g., could include identification of priority actions that have synergies, coordination of funding of such activities, requesting close coordination at the national level);
 - Establishment of formal links with the ISDR (e.g., though identification of priority actions, coordinating and improving budget allocations, pulling together resources to mobilise actions at the national and local levels in countries that are particularly vulnerable to climate change);
 - Establishment of formal links with the Development community through the MDG process and regular ODA (e.g., through participation in OECD Development Assistance Committee meetings, coordination with relevant UN agencies, investment banks)
 - Coordination and cross-fertilisation with other UN bodies (e.g., WMO, WHO, FAO) and other international and regional organisations that have capacity to contribute to adaptation at certain sectoral and regional levels.
- Forum for exchange of information and knowledge gathering
- Forum to address needs of countries particularly vulnerable to climate change
 - Identifying the most vulnerable countries in need for assistance
 - Giving guidance to the financing mechanism on assistance to these countries
- Catalyst for R&D and technology transfer for adaptation.

5.3 Specific goals of adaptation to be addressed

It is feasible to agree on several broad objectives of adaptation. They could either be result-oriented (e.g., coastal economies are protected from sea level rise, access to water is not jeopardised by climate change, people and property are protected from floods and hurricanes, etc.) or process-oriented (e.g., adaptation is

incorporated in national policies and strategies for climate sensitive sectors, early warning systems for every hydro-meteorological hazard are available to all countries, etc.).

Result-oriented goals define the ultimate objectives of adaptation actions. The main advantage of this kind of goals is that they clearly state what exactly we are trying to achieve by agreeing on certain actions. However, the achievement or non-achievement of these goals is not a direct result of actions directed at achieving these goals. Other factors that could be completely unrelated to adaptation actions or inactions on adaptation could have direct and significant impact on achievement of these goals. For example, it is possible to imagine a situation when an effective adaptation strategy is developed and implemented for a particular location but then a political or non-hydro meteorological disaster strikes, and the result-oriented objectives are not achieved. On the other hand, it is possible to imagine a different situation when adequate adaptation measures are not taken but objectives are achieved due to favourable weather conditions in a particular year or time period.

Result-oriented goals are more suitable as national objectives. It is more feasible for national governments to have responsibility for their citizens, including protection of citizens from impacts of climate change, than to impose such a responsibility on an international agreement. Process related goals are more realistic in this regard as they would define a process that is supposed to lead to the achievement of ultimate objectives. Process related goals would allow for the international process/framework to facilitate domestic actions on adaptation.

In thinking about result-oriented goals, it should be kept in mind that there are limits to adaptation, and ultimate protection from climate change impacts exclusively through adaptation actions is not possible. According to the IPCC Fourth Assessment Report, “the barriers, limits and costs of adaptation are not fully understood, and unmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt. The time at which such limits could be reached will vary between sectors and regions” (IPCC, 2007).

Process-related goals have several advantages. They are easier to monitor, and progress on achieving these goals can be easily assessed. Achievement of these goals gives a sense of accomplishment in terms of doing the right things and moving in the right direction. However, achievement of these goals does not mean that expected results regarding adaptation to climate change will also be achieved. Caution should also be applied in designing relevant processes. Assessments (at certain time intervals) will be needed in determining whether a chosen process actually leads to achieving the ultimate objectives.

It should be noted that the ultimate objective of the UNFCCC is to prevent “dangerous anthropogenic interference with the climate system.” While there is no explicit referencing to adaptation, the Convention strives “to ensure that food production is not threatened and ...economic development proceeds in a sustainable manner.” The result-oriented goals on adaptation could stem from the ultimate objective of the Convention. For example, the UNDP has proposed to use result-oriented goals for setting a framework for evaluation of its programmes on adaptation (UNDP, 2007).¹⁸ Table 6 below provides examples of possible goals for the UNFCCC agreement on adaptation.

¹⁸ Examples include “Food insecurity resulting from climate change minimized or reversed, and new opportunities for food production resulting from changes in climate explored”; “Water stress and scarcity of clean water resulting from climate change reduced/minimized”.

Table 6 Goals of adaptation

Examples of result-oriented goals	Examples of process-related goals
Adverse effects of climate change impacts on economies, societies and ecosystems are successfully mitigated.	Research on climate change impacts at national and sub-national levels is available for all vulnerable countries.
Resilience of economies and communities to climate change is strengthened.	Climate change projections and adaptation options are incorporated into national strategies and sectoral policies.
Coastal economies and ecosystems are protected from sea-level rise/land loss.	Climate change projections are incorporated in new building standards in hazard prone zones (e.g., flood plains, coastal zones).
Economic losses from climate change impacts are minimised.	Climate change projections and adaptation options are incorporated into national water policies and laws, (including flood management and drought management plans).
Access to water is not jeopardised in areas that rely on glaciers for water storing.	Current and future hydro-meteorological disaster risk zones are mapped and regularly updated.
Access to water resources is not jeopardised by climate change.	Early warning systems for all hydro-meteorological hazards and communication strategies are developed.
People are protected from hunger caused by droughts.	Strategies for disaster prevention and management are developed and implemented.
	Land-use planning incorporates climate change projections (e.g., coastal zone strategies integrate sea-level projections).
	A coordination mechanism between the ISDR and the UNFCCC is set up.
	A coordination mechanism between the UN CBD, UN CD and the UNFCCC is established.
	NAPAs for all LDCs are developed.
	National Communications for non-NAPA developing countries include strong sections on vulnerability and adaptation (similar to the assessments conducted under the NAPA process).
	Particularly vulnerable countries are identified, probably several groups of particularly vulnerable countries (depending on particular climate change impacts) are defined.

Timeframe needs to be introduced for the achievement of goals. For example, it could be proposed to introduce annual reporting to measure progress in achieving a 5-year accumulative objective. More thoughts on reporting and review are provided in Section 5.6.

It could also be useful to think of strategic goals of the international cooperation on adaptation. Apart from using the international process to stimulate national actions on adaptation and encourage assistance from developed countries to developing countries, Parties have other reasons and motivations for international cooperation on adaptation. It appears that Parties seek international cooperation for developing better knowledge and understanding on adaptation and creating improved tools and methods

for vulnerability assessment, risk management and adaptation. Parties also strive to avoid duplication of efforts at the international and national levels and use available financial resources more efficiently. The international cooperation on adaptation could also facilitate involvement of various relevant players at national and international levels. Development of market-based tools to generate financial resources for adaptation and insurance schemes to facilitate adaptive behaviour and create funds for residual damage relief would also require international cooperation.

5.4 Targets and metrics to measure progress on adaptation

Following the setting of broad objectives for an agreement on adaptation, specific targets could also be envisaged. These targets would be closely connected with objectives. The logic behind more specific targets is that they disaggregate general objectives into incremental targets/objectives that could be measured. More specific targets will bridge general objectives with metrics/indicators for measuring progress with achieving them. There are several ways for the targets and indicators to be designed. They could either be expressed in financial commitments (with the assumption that these commitments lead to fulfilment of general objectives) or in development targets and indicators, or adaptation targets could be expressed in policy indicators.

Financial commitments would include national allocations dedicated to adaptation and ODA relevant to adaptation. Development targets could be based on concrete and measurable indicators that would allow to measure gradual progress on adaptation-minded development (including adaptive capacity). The limitation of this approach is that it could be seen as only developing country relevant. Although, there are ways to make this approach universal for all countries by developing such indicators that are relevant for all countries and conditions, (e.g., % of vulnerable population per country, % of population living on flood plains). The third option is to set adaptation policy indicators for all vulnerable sectors to be used by all countries. Countries could be evaluated by the degree of adherence to these indicators. For example, one of the indicators for the water sector could be availability of flood plans (including forecasts, preparedness measures, emergency response measures, clear institutional responsibilities in case of floods, etc.). All UNFCCC Parties will have to report and be reviewed on how the agreed indicators are implemented in their national (and sub-national) contexts.

Financial targets and metrics: All Parties could agree to dedicate a certain % of their GDP to domestic adaptation actions. In addition, developed country Parties could agree on a certain financial contribution to eligible developing countries to assist them in developing and implementing adaptation actions, similarly to their commitments for MDGs. This assistance could be expressed in share of GDP, or a share of GNP, or in absolute figures.

Financial targets could be set up based on available (although still very limited) information on the cost of adaptation actions. For example, according to the UNFCCC recent report on financing (UNFCCC 2007), the cost of adaptation to sea level rise including investment costs (beach nourishment and sea dykes) is estimated to be USD 11 billion in 2030, (UNFCCC, 2007). Using the assumptions made to arrive at these estimates, national figures could be derived for coastal countries. The cost of adaptation to permafrost and glacier melting is not known. According to the same UNFCCC report, the cost of adaptation in the key sectors (water, health, agriculture, natural ecosystems, coastal zones and infrastructure) could be between 58 and 193 billion per year by 2030 (including the investments needs to adapt infrastructure to climate change in the order between 8 and 130 billion per year).

Financial targets would be more meaningful if the cost of adaptation (at the national level, and/or sectoral level) could be known. In such a case, provided assistance and/or domestic allocations for adaptation could be measured against the determined needs. Given the multidimensional nature of adaptation and various scales of adaptation actions, it would probably be impossible to account for all resources directed at adaptation activities. Parties could agree to focus on financial resources that are directed at:

- Development and implementation of specific adaptation provisions within national and sectoral policies;

- Capacity building, outreach on adaptation;
- Development of scientific and technical capacity on adaptation;
- Research and development to address adaptation;
- Large scale climate-proof investments;
- Specific (location or hazard-related) adaptation projects.

Development targets and indicators: Parties could set global targets on collective adaptive capacity and adaptation. If a limited scope is selected, Parties could set global targets on collective adaptive capacity and adaptation to sea level rise, glacier and permafrost melting, and extreme hydro-meteorological events. For a broader scope, the range of targets and indicators will also be wide. For example, the following targets could be proposed:

- All LDCs and other low income countries receive adequate assistance for the establishment of early warning centres for each type of prevailing disasters
- All countries develop disaster preparedness plans and implementation strategies
- % of new development/investment that follows specific requirements on adaptation
- % of population living on flood plains with a high risk of floods
- % of population vulnerable to droughts
- % of land lost to sea level rise every 5 years/every decade;
- Share of preserved coastal wetlands
- Percentage of population in each country living in hazard prone areas
- Availability of early warning services for each country

Some indicators for the adaptation-mindful development could be adopted from the indicators developed to measure sustainable development and/or Millennium Development Goals. There are 48 indicators that measure progress achieved in meeting MDGs¹⁹. There are also 96 indicators that were developed for sustainable development (50 of them are considered to be core indicators)²⁰. Some of these indicators are relevant for adaptation. The advantage of using the existing indicators is that there is already an experience with collecting data according to these indicators and reporting on progress. Besides, a lot of work and negotiations were invested in developing these indicators, so their recycling for adaptation purposes would be cost-efficient. The following table suggests several indicators for measuring progress on building adaptive capacity and implementing adaptation. Some of these indicators are adopted from the indicators for measuring progress on MDGs and Sustainable Development.

Possible indicators for measuring progress on adaptation could include the following:

⇒ Indicators of adaptive capacity:

- Proportion of population below \$1 (PPP) per day
- Net enrolment ratio in primary education
- Literacy rate of 15-24 year-olds
- Population with HIV/AIDs
- Prevalence and death rates associated with malaria
- Ratio of area protected to maintain biological diversity to surface area
- Proportion of households with access to secure tenure
- Proportion of total bilateral, sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation)
- % of population in developing countries having access to micro-crediting and other financial assistance (grants or loans) to implement adaptation projects
- % of national budget of the OECD DAC and upper-middle income developing countries directed at R&D in adaptation technologies

¹⁹ <http://mdgs.un.org/unsd/mdg/Host.aspx?Content=Indicators/OfficialList.htm>

²⁰ <http://www.un.org/esa/sustdev/natlinfo/indicators/isd.htm>

- % of national budget dedicated to vulnerability assessments

⇒ Indicators of result-oriented adaptation actions:

- Prevalence of underweight children under-five years of age.
- Proportion of population below minimum level of dietary energy consumption.
- Share of preserved coastal wetlands.
- Human and economic loss due to hydro-meteorological disasters.
- % of land lost to sea level rise.
- Proportion of population with sustainable access to an improved water source, urban and rural.
- Proportion of population living on flood planes

⇒ Indicators of process-oriented adaptation actions:

- Availability of national climate change impacts and vulnerability assessments.
- Availability of national adaptation strategies with identified adaptation priority actions.
- National reports on integrating adaptation into sectoral policies and planning.
- Amount of GEF funding directed for community adaptation projects (developing country Parties only).

Caution is needed in developing and using indicators. Although indicators provide tangible targets for governments to attain and can, therefore, provide a useful measure of progress, they may also have unintended negative side effects. For example, at the local level in developing countries, households have complex livelihood and coping strategies, which may not always be appropriately captured in an indicator to measure adaptation success. Forcing governments to reach certain targets may actually increase the rigidity of the ‘environment’ within which households develop their livelihoods instead of providing them with greater flexibility and greater ‘room for manoeuvre’, as advocated in recent livelihoods and adaptation literature. For example, using “% of population living in a floodplain” as an indicator of adaptation success (where a low percentage would be considered a move towards successful adaptation) may lead governments to adopt policies of resettlement and relocation, which (when implemented incorrectly) may not actually benefit the households concerned nor lead to real adaptation. Following the 2000 floods in Mozambique many households were relocated away from the floodplains in which they lived. However, many of these households were not provided with new homes, sufficient farmland or adequate alternatives to their original livelihood strategies and have, thus, returned back to the floodplains.

Countries may also need flexibility in adjusting indicators to their specific conditions. It could be envisaged that a set of core international indicators for adaptation is developed under the UNFCCC with a bigger list of suggested indicators. Parties could be given flexibility in applying or modifying a longer list of indicators.

Sectoral policies indicators. The integration of adaptation considerations into policy sectors and economic activities (mainstreaming) is one of the most challenging goals at an international level. Policy indicators are one possible way of ensuring that adaptation issues are being consistently considered in public policy and investment decisions. Development of the sector performance indicator system could be based on (a) the type and dimension of the sector; (b) baseline climate sensitivity; (c) major significant climate change impacts identified/predicted and related adaptation measures; (d) the identification of impacts which have poor accuracy or lack of basic data; (e) the need for all sector domains to have a common general indicator list, in addition to sector-specific indicators; (f) the importance of indicators satisfying the information requirements of the stakeholders (internal and external); and (g) the need for the information to be potentially comparable and widely disseminated.

Indicators could be designed to reflect interactions between the sector and climate change impacts: this includes positive and negative impacts of sectoral activity on the climate vulnerability as well as impacts of climate change on the sectoral activity. They could also be designed to reflect economic linkages

between the sector and climate change impacts, including cost and benefits of adaptation measures to the sector and the economy.

Examples could include special building codes for residential, commercial and industrial construction in storm-and flood-prone areas; measures on efficient water use for the water sector and agriculture in potentially water scarce areas; risk reduction measures for floods, droughts, hurricanes; sea defence approaches and/or specific land use management standards for coastal areas, etc. Previous work on adaptation within the Annex I Expert Group provides some insights on sectoral policies (in the water sector and in management of coastal zones) and their interactions with adaptation (Levina E. and Adams H, 2006, Levina E., 2006, and Levina et.al., 2007).

5.5 Funding mechanisms

Parties need to agree whether they want to create incentives for mobilising the existing funding sources or they want to suggest new mechanisms that would generate additional financial resources. Among the existing sources, the following are the most obvious:

- National governments (budget allocations, cost recovery schemes)
 - Domestic allocations by developed and developing countries governments
 - ODA: bilateral and multilateral
- Private investments: banks, private sector
 - Domestic private sector
 - Foreign direct investment
- Private foundations
 - Domestic actions
 - International assistance
- GEF dedicated funds for adaptation in developing countries
- Micro financing (joint private and ODA efforts)

Table 7 summarises funding options for various types of adaptation actions.

Table 7: Categories of adaptation activities and their funding sources

	National government (domestic)	ODA: bi-lateral and multilateral	Private sector	Private foundations	GEF specialised funds	Micro-financing	Innovative approaches (e.g., levy on carbon market)
Regulatory changes	x	x			x		
Institutional changes	x	x		x	x		
Information, outreach, awareness building	x	x		x	x		
Education	x	x		x	x		
Health	x	x		x	x		
Scientific capacity	x	x	x	x	x		
Infrastructure/ Technology	x	x	x		x	x	
Management practices	x	x	x	x	x	x	
Insurance	x	x	x			x	x
Dealing with Extreme events	x	x	x	x	x		
Community practices	x	x		x	x	x	

Source: Author's summary.

Note: Resources collected through innovative approaches could be used for any type of adaptation actions, subject to the decision by the Parties; insurance is marked as an example.

Creation of *micro-financing* structures in developing countries would allow local communities, civil society groups; municipalities implement adaptation actions on their own. Instead of prescribing certain adaptation measures and techniques, people need to be given resources and possibilities to find adaptation solutions for themselves. The major obstacle for development and innovation is the lack of access to financing. So, what is needed is creation of numerous financing facilities in all developing countries so that communities will have access to small scale grants. Micro-financing structures could combine financial services with clearing house services that would facilitate access to relevant information and best practices. Money could be given in the form of loans (instead of grants) but with very favourable conditions, for example, long pay back periods or low interest rates. ODA funding could be used to assist the private sector in setting up such micro financing services.

National governments could create mechanisms and develop *policy requirements* that would encourage allocation of resources into adaptation. For example, national governments could incorporate climate change and adaptation requirements into existing EIAs. New provisions for the EIAs could be established that would require assessments of activities/investments' vulnerability to climate change impacts and their effects on country vulnerability to climate change. National governments could also incorporate adaptation provisions into national and sectoral policies and strategies. ODA could also be guided by

specific guidelines on how to integrate adaptation into development assistance activities. The OECD is already in the process of developing such guidelines. Private foundations are also active in areas relevant to adaptation. The increasing financial flows from foundations and their role on the ground should be recognised. They may also benefit from guidelines on adaptation that are being developed for ODA.

The private sector will eventually implement adaptation out of self-interest. However, at this stage of the knowledge and experience, it could be helpful to develop guidelines for enterprises on how to integrate climate change concerns into their routine risk assessment and strategic decision-making. In addition, if national governments incorporate adaptation into their EIA requirements and sectoral policies, companies will have to comply with these requirements.

There are two important things that the UNFCCC could do to mobilise the existing funding sources and ensure financial flows into adaptation. First, it could require national actions on adaptation and request that Parties report on their national actions, strategies, policies and measures on adaptation. The review process could be used to assess how Parties comply with this requirement. Second, the UNFCCC could continue to catalyse the process of developing the methodological materials on adaptation. Any work encouraged and/or implemented by the UNFCCC on methods and tools on adaptation (e.g., methodology for mainstreaming, climate-related risk management, etc.) would assist Parties in formulating their national approaches to adaptation that would enable financial flows into adaptation.

As discussed in Section 3, several proposals on a post-2012 climate regime contain suggestions on innovative mechanisms for generating financial resources for adaptation, including a levy on carbon market (as an expansion to the 2% share of the proceeds on CDM transactions), a carbon-or fossil fuel levy, a levy on air travel, currency transaction development levy, a share of proceeds from GHG allowances auction revenues, etc. It may be useful to examine these mechanisms in more detail and analyse how they could be designed for adaptation purposes. However, it should be noted that the same mechanisms are also proposed for generating funds for GHG mitigation.

Insurance could be an effective adaptation tool in itself and could also generate funds to cover residual effects of climate change impacts after adaptation measures have already been implemented. One important condition that has to be observed in setting up insurance mechanisms is that it has to reflect actual risks associated with specific locations and activities. It is possible to think of various types of insurance that would serve purposes of addressing climate change risks: Insurance for investments (client: private sector, governmental enterprises); Insurance for property (client: private, governmental property); Insurance for large scale catastrophes (client: national government, private citizens, business owners). Many proposals on a post-2012 climate regime suggest insurance as a possible mechanism to address risks of climate change. A separate analysis is needed on the role that the UNFCCC could play in establishing an insurance mechanism for climate change.

5.6 Reporting and review

Reporting by the Parties to the Convention of the Parties (COP) through the secretariat on the progress made on adaptation will be an important component of the international agreement. The reporting requirements will depend on the agreements on all other elements such as scope of activities, goals, targets, indicators for measuring progress, and responsibilities of various parties. It could be envisaged that Parties will be required to report on:

- Domestic actions to address vulnerability and adaptation, including
 - development and application of tools for assessing climate change impacts at the national and sub-national levels,
 - development and application of tools for assessing national and sub-national vulnerability to climate change,

- development of scientific capacity for fostering understanding of climate change,
 - development and implementation of national adaptation strategies,
 - integration of adaptation into national and sectoral strategies and policies,
 - institutional arrangements to deal with adaptation,
 - investments into research and development of adaptation technologies and techniques,
 - measures to address extreme events.
- ODA by Annex I countries directed at adaptation activities (that fall in the scope of agreed actions, including capacity building),
 - Implementation of adaptation projects and creation of enabling conditions for the implementation of such projects (by non Annex I countries), and
 - Transfer of adaptation technologies.

The process of National Communications could be used for this reporting. However, new reporting guidelines need to be considered. Once the scope of activities and associated goals and indicators/metrics are agreed, the reporting guidelines will need to reflect these agreements. The reporting by the Parties on adaptation will need to be done in such a way to facilitate assessment of individual country and collective Convention performances regarding adaptation to climate change.

The Nairobi Work Programme on adaptation sets a useful framework for collecting and exchanging information on adaptation-related activities. Parties' submissions on Methods and tools; Data and observations; Climate modelling, scenarios and downscaling; Climate related risks and extreme events; Socio-economic information; Adaptation planning and practices; Research; Technologies for adaptation; and Economic diversification could provide a prototype for future reporting on adaptation-related actions.

Given differentiated responsibilities of the Parties under the Convention and additional responsibilities of the Annex I Parties to provide assistance to developing countries, different elements of reporting by the Annex I and non-Annex I countries could also be envisaged. For example, Annex I Parties may be required to report on their assistance projects relevant to adaptation in developing countries, and/or share of their total development assistance funding dedicated to adaptation. Developing countries may be required to report on progress made in addressing their adaptation needs, and conditions that they create to facilitate implementation of adaptation assistance projects. In addition, Parties may wish to reconsider the non-Annex I countries list and further differentiate this list based on the countries' vulnerabilities and abilities to develop and implement adaptation measures on their own and report to the Convention.

Reporting by the GEF on adaptation activities could also be streamlined. In addition, reporting by the Adaptation Fund will need to be facilitated through reporting guidelines.

To facilitate coordination of adaptation actions by all relevant international agreements and to account for adaptation actions that take place outside the UNFCCC, an agreement may be needed between the UNFCCC and ISDR, UNCBD and UNCD on cross-reporting.

The aim of the *review process* is to assess what progress has been made in developing and implementing adaptation measures. The review process could also be used to assist countries in improving their adaptation efforts and for highlighting additional areas that need to be addressed.

Review process could be done through in-depth country review visits and reports. There are many examples of country review processes that are carried out for assessing countries' performance with

certain policies. For example, the OECD conducts Environmental Performance reviews for its member countries. The UN Economic Commission for Europe is in charge of a similar process in European countries that are not OECD members. The IEA conducts energy policy reviews of its member countries and non-members with important energy resources. The UNFCCC is also engaged in review desk studies and country visits for the purposes of reporting under National Communications and GHG emission inventories. Country review visits could provide a platform for exchange of information, ideas, expert dialogue. In addition to generating valuable country-specific information and assessment, such reviews could also assist countries in formulating their adaptation strategies and in acquiring knowledge of best practices and experiences from other countries.

5.7 Responsibilities of the Parties

The responsibility for drafting decision text lies with the UNFCCC COP and all its Parties. However, in drafting such a text, Parties may find it useful to draw upon the language used in other Multilateral Environmental Agreements, including the provisions of the UN Convention on Desertification. The following points, which are based on the UN Convention on Desertification, might be considered in defining the responsibilities of the Parties.

Obligations of all Parties

In addition to their obligations pursuant to article 4 of the Convention, all Parties undertake to:

- (a) give due priority to adaptation to climate change, and allocate adequate resources in accordance with their circumstances and capabilities;
- (b) establish strategies and priorities, within the framework of sustainable development plans and/or policies, to address adaptation;
- (c) address the underlying causes of vulnerability and pay special attention to the socio-economic factors contributing to vulnerability;
- (d) promote awareness and facilitate the participation of local populations, particularly women and youth, with the support of non-governmental organizations, in adaptation efforts to mitigate the effects of climate change; and
- (e) provide an enabling environment by strengthening, as appropriate, relevant existing legislation and, where they do not exist, enacting new laws and establishing long-term policies and action programmes.

Obligations of developed country Parties

In addition to their general obligations pursuant to article 4, developed country Parties undertake to:

- (a) actively support, as agreed, individually or jointly, the efforts of affected developing country Parties, particularly those in Africa, and the least developed countries, to adapt to climate change and mitigate the effects of climate change impacts;
- (b) provide substantial financial resources and other forms of support to assist affected developing country Parties, and especially particularly vulnerable countries, effectively to develop and implement their own long-term plans and strategies on adaptation;
- (c) promote the mobilization of new and additional funding;
- (d) encourage the mobilization of funding from the private sector and other non-governmental sources; and
- (e) promote and facilitate access by affected country Parties, particularly affected developing country Parties, to appropriate technology, knowledge and know-how.

Priority for particularly vulnerable countries

In implementing this Convention, the Parties shall give priority to affected particularly vulnerable countries (African country Parties, LDCs, and small island states) in the light of the particular situation prevailing in these countries, while not neglecting affected other developing country Parties.

6. Conclusions

The existing legal framework for adaptation under the Convention and the Kyoto Protocol allows for comprehensive action on adaptation. Since 1992 many significant achievements in addressing vulnerability and adaptation have been made. However, many gaps remain, especially in implementation of adaptation measures. The main gaps can be summarised as the following:

- Actions on adaptation are still very limited and sporadic.
- Adaptation is still largely confined to the limited agenda of the climate change community.
- Formal links with other conventions, sustainable development agenda and MDGs are not established.
- Clear responsibilities regarding adaptation and action plans for Parties are not defined. There is no system in place to measure progress on adaptation;
- A clear framework for staged and planned adaptation actions (including an agreed scope of activities) does not yet exist.

It has been recognised that adaptation occurs in the course of the implementation of other international agreements, in particular the Convention on Biological Diversity, Convention on Desertification, the International Strategy for Disaster Risk Reduction, development assistance, and Millennium Development Goals. However, the level of efforts on meeting the objectives of these agreements and the level of funding is inadequate, and as a result the associated adaptation benefits are also limited.

A new agreement on adaptation could include the following elements:

- i. Scope of adaptation-relevant activities;
- ii. Goals of adaptation;
- iii. Targets and indicators/metrics for measuring progress;
- iv. Reporting and review;
- v. Expanded funding mechanisms (including national policy requirements that would mobilise funding into adaptation);
- vi. Responsibilities of the Parties.
- vii. Cooperation with other relevant international agreements and organisations.

Adaptation to climate change is a challenging process. This paper contributes to a first step to take stock of already on-going efforts that contribute to adaptation, of the existing post-2012 proposals, and available funding mechanisms as well as tools that could mobilise adaptation actions. It also identifies the main components of a possible post-2012 agreement on adaptation. These are fundamental for moving forward towards an international agreement to address adaptation.

Annex I. OECD DAC CRS database purpose codes marked for adaptation

	DAC Purpose Codes	Included in the list of climate-sensitive flows	Included in the list of adaptation-relevant flows
Education	11110: Education policy & admin. management		x
	11120: Education facilities and training		
	11130: Teacher training		
	11182: Educational research		
	11220: Primary education		x
	11230: Basic life skills for youth & adults		x
	11240: Early childhood education		x
	11320: Secondary education		x
	11330: Vocational training		
	11420: Higher education		x
	11430: Advanced tech. & managerial training		
Health	12110: Health policy & admin. management		x
	12181: Medical education/training		
	12182: Medical research		
	12191: Medical services		x
	12220: Basic health care		x
	12230: Basic health infrastructure		x
	12240: Basic nutrition		x
	12250: Infectious disease control	x	x
	12261: Health education		x
	12281: Health personnel development		
	13010: Population policy and admin. mgmt		
	13020: Reproductive health care		
	13030: Family planning		
	13040: Std control including hiv/aids		x
13081: Personnel dvpt: pop. & repro health			
Water	14010: Water resources policy/admin. mgmt	x	x
	14015: Water resources protection	x	x
	14020: Water supply & sanit. - large syst.	x	x
	14030: Basic drinking water supply and basic sanitation	x	x
	14040: River development	x	x
	14050: Waste management/disposal	x	x
	14081: Educ./trng:water supply & sanitation	x	x
Government and civil society	15110: Economic and development policy/planning	x	x
	15120: Public sector financial management		x
	15130: Legal and judicial development		x
	15140: Government administration		x
	15150: Strengthening civil society		x
	15161: Elections		
	15162: Human rights		

	15163: Free flow of information		x
	15164: Women's equality organisations and institutions		
Security	15210: Security system management and reform		
	15220: Civilian peace-building, conflict prevention and resolution		
	15230: Post-conflict peace building (UN)		
	15240: Reintegration and salw control		
	15250: Land mine clearance		
	15261: Child soldiers (prevention and demobilisation)		
Social services and infrastructure	16010: Social/welfare services		
	16020: Employment policy and admin. mgmt.		x
	16030: Housing policy and admin. management		x
	16040: Low-cost housing		x
	16050: Multisector aid for basic soc. serv.		x
	16061: Culture and recreation		
	16062: Statistical capacity building		x
	16063: Narcotics control		
	16064: Social mitigation of hiv/aids		
Transport	21010: Transport policy & admin. management	x	x
	21020: Road transport	x	x
	21030: Rail transport	x	x
	21040: Water transport	x	x
	21050: Air transport	x	x
	21061: Storage		
	21081: Educ./trng in transport & storage		
Communication	22010: Communications policy & admin. mgmt		x
	22020: Telecommunications		
	22030: Radio/television/print media		
	22040: Information and communication technology		
Energy	23010: Energy policy and admin. management		x
	23020: Power generat./non-renewable sources		
	23030: Power generation/renewable sources	x	x
	23040: Electrical transmission/distribution		
	23050: Gas distribution		
	23061: Oil-fired power plants		
	23062: Gas-fired power plants		
	23063: Coal-fired power plants		
	23064: Nuclear power plants		
	23065: Hydro-electric power plants	x	x
	23066: Geothermal energy	x	x
	23067: Solar energy	x	x
23068: Wind power	x	x	

	23069: Ocean power	x	x
	23070: Biomass	x	x
	23081: Energy education/training		
	23082: Energy research		
Financial services	24010: Financial policy & admin. management		x
	24020: Monetary institutions		x
	24030: Formal sector financ. intermediaries		x
	24040: Informal/semi-formal fin. intermed.		x
	24081: Education/trng in banking & fin. services		
	25010: Business support services & institutions		x
	25020: Privatisation		
Agriculture, Forestry, Fisheries	31110: Agricultural policy & admin. mgmt	x	x
	31120: Agricultural development	x	x
	31130: Agricultural land resources	x	x
	31140: Agricultural water resources	x	x
	31150: Agricultural inputs	x	x
	31161: Food crop production	x	x
	31162: Industrial crops/export crops	x	x
	31163: Livestock	x	x
	31164: Agrarian reform	x	x
	31165: Agricultural alternative development	x	x
	31166: Agricultural extension	x	x
	31181: Agricultural education/training	x	x
	31182: Agricultural research	x	x
	31191: Agricultural services	x	x
	31192: Plant/post-harvest prot. & pest ctrl	x	x
	31193: Agricultural financial services	x	x
	31194: Agricultural co-operatives	x	x
	31195: Livestock/veterinary services	x	x
	31210: Forestry policy & admin. management	x	x
	31220: Forestry development	x	x
	31261: Fuelwood/charcoal	x	x
	31281: Forestry education/training	x	x
	31282: Forestry research	x	x
	31291: Forestry services	x	x
	31310: Fishing policy and admin. management	x	x
	31320: Fishery development	x	x
	31381: Fishery education/training	x	x
	31382: Fishery research	x	x
31391: Fishery services	x	x	
Industry, Mining	32110: Industrial policy & admin. mgmt		x
	32120: Industrial development		
	32130: Sme development		
	32140: Cottage industries & handicraft		
	32161: Agro-industries		x
	32162: Forest industries		x
	32163: Textiles - leather & substitutes		

	32164: Chemicals		
	32165: Fertilizer plants		
	32166: Cement/lime/plaster		
	32167: Energy manufacturing		
	32168: Pharmaceutical production		
	32169: Basic metal industries		
	32170: Non-ferrous metal industries		
	32171: Engineering		x
	32172: Transport equipment industry		
	32182: Technological research & development		x
	32210: Mineral/mining policy & admin. mgmt		
	32220: Mineral prospection and exploration		
	32261: Coal		
	32262: Oil and gas		
	32263: Ferrous metals		
	32264: Non-ferrous metals		
	32265: Precious metals/materials		
	32266: Industrial minerals		
	32267: Fertilizer minerals		
	32268: Off-shore minerals		
Construction	32310: Construction policy and admin. mgmt		x
Trade	33110: Trade policy and admin. management		x
	33120: Trade facilitation		
	33130: Regional trade agreements		
	33140: Multilateral trade negotiations		
	33181: Trade education/training		
Tourism	33210: Tourism policy and admin. management	x	x
Environment	41010: Environmental policy and admin. mgmt	x	x
	41020: Biosphere protection	x	x
	41030: Bio-diversity	x	x
	41040: Site preservation	x	x
	41050: Flood prevention/control	x	x
	41081: Environmental education/training	x	x
	41082: Environmental research	x	x
Women in development	42010: Women in development (including multisector. wid proj. & programmes)		x
Multisector	43010: Multisector aid	x	x
Urban and rural development	43030: Urban development and management	x	x
	43040: Rural development	x	x
	43050: Non-agricultural alternative dvpt	x	x
	43081: Multisector education/training		x
	43082: Research/scientific institutions		x
Commodity Aid / General Prog. Assistance	51010: General budget support		
	52010: Food security programmes/food aid	x	x
	53030: Import support (capital goods)		

	53040: Import support (commodities)		
Action Relating to Debt	60010: Action relating to debt		
	60020: Debt forgiveness		
	60030: Relief of multilateral debt		
	60040: Rescheduling and refinancing		
	60061: Debt for development swap		
	60062: Other debt swap		
	60063: Debt buy-back		
	Emergency Assistance & Reconstruction	72010: Emergency/distress relief	x
72040: Emergency food aid		x	x
72050: Relief co-ordination; protection and support services		x	x
73010: Reconstruction relief		x	x
	74010: Disaster prevention and preparedness	x	x
Administrative costs of donors	91010: Administrative costs		
Support to NGO's	92010: Support to national NGO's		x
	92020: Support to international NGO's		x
	92030: Support to local and regional NGO's		x
Other	93010: Refugees in donor countries		
	99810: Sectors not specified		
	99820: Promotion of development awareness		x

Annex II. Impacts of adaptation projects on biodiversity²¹

<i>Types of adaptation activities</i>	<i>Potential impacts on biodiversity</i>	<i>Potential risk to biodiversity</i> (score of low-medium-high-very high)	<i>Action for risk management</i>
<i>Infrastructural development based ^{22/}</i>			
Sea walls	Negative	High-very high if concrete/rock structures Low-medium if using mud walls and vegetation	Include biodiversity terrestrial and coastal/marine) considerations in EIA both on the
Bridges to cross potentially inundated areas due to climate change	Negative	Medium-high depending on the location	Include terrestrial and aquatic biodiversity considerations in EIA
Diversion of freshwater to areas suffering water shortage (dams or irrigation channels) or increased extraction of groundwater supply	Negative or neutral	Medium-high depending on environmental flow, the rate of withdrawal etc	Include terrestrial and aquatic biodiversity considerations in EIA
Buildings on stilt	Negative to neutral	Low if already in urban areas; rate of erosion could decrease	Monitor for likely effects on biodiversity and include adaptive management
<i>Rezoning for urban development or migration</i>			
Rezoning in coastal areas	Negative or positive	High-very high if urbanization of high biodiversity areas; low otherwise	Strategic environmental assessment should consider the impact on biodiversity and zone accordingly; allow for appropriate conservation areas for biodiversity
Migration of people from coastal/marginal lands (e.g. in semi-arid areas)	Negative or positive	Low if moving to urban areas although could place additional pressure on water and energy resources; high if moving to slightly less marginal areas	Educate the urban planners to minimise the exploitation of natural resources; effect of other migration may be hard to manage
<i>Agriculture</i>			
Introduction of drought tolerant varieties	Neutral or negative if extending into marginal lands not cultivated before	Low if the growth period is not extended	
Introduction of salt tolerant varieties	Neutral to negative	High as areas could become more saline and reduce the endemic biodiversity	

²¹ UN CBD Proposed Framework: - Practical Guidance: UNEP/CBD/AHTEG-BDACC/1/3

²² In general, these type of adaptation options would need environmental impact assessments and thus biodiversity considerations should be in the policy/regulatory framework for EIA. In all cases, it is important to include monitoring for impact of the activity on biodiversity if the project is to go ahead.

Introduction of higher temperature tolerant varieties	Neutral to negative	High if using more water for growth	
Introduction of pest resistant varieties	Neutral to positive	Low if neutral impact on biodiversity if pests not able to non-agrobiodiversity, high if doing so	
Introduction or extending multi-cropping or mixed farming systems Introduction of new crop/animal species	Impacts: positive if there is reduction in chemical use for pest and disease control and/or decrease in erosion due to crop cover all year round	Low –medium if replacing an existing crop without extending the cropland; High-very high if the crop/animal becomes an invasive species	Assess the potential invasiveness risk of the introduced species; minimise the land under intensive agriculture
Low tillage cropping, maintaining cropping residues and reducing fallow periods ^{23/}	Impacts: positive due to possible decreased soil erosion and decreased loss of soil biodiversity	Low	Monitor for the gains in biodiversity or reduction in erosion and potential water use
Changes in timing and type of irrigation and fertiliser use	Positive if introducing water saving (e.g. drip irrigation) in areas that were already irrigated, negative if introducing irrigation	Low	Monitor for the changes and or look at the possibility of introducing the most appropriate irrigation for the crop; for fertiliser; timing of fertiliser application can be important in minimising the risk to biodiversity
Changes in grazing management ²⁴	Positive if reducing the intensity of grazing, negative if extending the areas grazed	Low to moderate	Monitor the effects on biodiversity
Abandonment of agriculture	Positive if native/endemic species colonise old fields; negative if old fields colonised by non-native and/or invasive species	Low to moderate	Management of the abandoned land is necessary to provide maximum benefits to biodiversity
Abandonment of agriculture	Positive if native/endemic species colonise old fields; negative if old fields colonised by non-native and/or invasive species	Low to moderate	Management of the abandoned land is necessary to provide maximum benefits to biodiversity
Forest management			
Natural forest regeneration, sustainable forest management ²⁵ and avoided deforestation	Positive, if natural forest regeneration occurs and sustainable forest management harvesting practices are applied	Low	Monitoring to assess the gains for biodiversity

²³ Can be a LULUCF-based mitigation option too

²⁴ Can be a mitigation option

²⁵ Some Annex 1 parties can declare this as an activity under the Kyoto protocol

Conservation and sustainable use measures			
Corridors		Low-medium if allowing migration of invasive species	Monitor the migration of plant and animal species in the corridors and the connected cells of the landscapes and manage invasive species when detected
Wider landscape management		Low-very low as aimed to benefit biodiversity	Monitoring would still be necessary to ensure that the goals are being met Need to consider and if necessary enact policies to deal with land tenure issues and compensation for reduction in intensity of farming practices

Annex III. World Bank Global Framework for Disaster Risk Reduction: eligible countries

Country	% of total area at risk	% of population in areas at risk	% of GDP in areas at risk	Least Developed Country	Small Island Developing State
1. El Salvador	88.7	95.4	96.4		
2. Jamaica	94.9	96.3	96.3		x
3. Dominican Rep	87.2	94.7	95.6		x
4. Guatemala	52.7	92.1	92.2		
5. Korea, Rep. of	82.8	92.2	91.5		
6. Vietnam	33.2	75.7	89.4		
7. Albania	86.4	88.6	88.5		
8. Costa Rica	51.9	84.8	86.6		
9. Colombia	21.2	84.7	86.6		
10. Bangladesh	71.4	83.6	86.5	x	
11. Phillippines	50.3	81.3	85.2		
12. Turkey	73	80.9	83.3		
13. Trinidat and Tobago	66.7	82.4	83.1		x
14. Guam	83.6	84.5	82.6		
15. Antigua and Barbuda	53.4	80.4	80.4		x
16. Barbados	79.9	79.9	79.9		x
17. San Marino	66.7	55.3	73.1		
18. Ecuador	24.4	73.6	72.2		
19. Mexico	15.9	68.2	71.1		
20. Dominica	68.3	67	68.3		x
21. Nicaragua	21.6	68.7	67.9		
22. Chile	5.2	64.9	67.7		
23. Iran	31.7	69.8	66.5		
24. Venezuela	4.9	61.2	65.9		
25. Uzbekistan	9.3	65.6	65.5		
26. St.Kitts and Nevis	0.01	52.8	64.9		
27. Jordan	13.7	64.9	64.7		
28. Argentina	1.8	57.4	63.2		
29. South Africa	8.6	56.4	62.4		
30. Tunisia	30.4	64.1	62.4		
31. Indonesia	11.5	67.4	62.3		
32. China	13.1	49.8	56.6		
33. Honduras	19	56	56.5		
34. Haiti	44.4	47.9	56	x	x
35. Uruguay	3	55	55		
36. Peru	4	41.5	53.7		
37. Liechtenstein	53.9	45.9	53.6		
38. Kyrgyz rep.	8.3	51.3	53.4		
39. Montserrat	50.3	50.3	50.3		
40. Romania	37.4	45.8	50.3		

41. India	22.1	47.7	49.6		
42. Algeria	3.1	49.3	48.3		
43. Niue	48.1	48.1	48.1		
44. Cyprus	50.4	60.5	47.4		x
45. Andorra	43.5	19.4	45		
46. Paraguay	2	45.6	42.9		
47. Azerbaijan	15.6	42.3	42.4		
48. Pakistan	9	40.1	41.6		
49. St.Vincent	41.6	41.6	41.6		x
50. Georgia	4.4	40.5	41		
51. Macedonia	38.8	29.6	38.7		
52. Tajikistan	4.1	38.2	38.3		
53. Bolivia	1	36.6	37.7		
54. Mozambique	0.01	1.9	37.3	x	
55. Djibouti	1.9	31.7	35.3	x	
56. Cambodia	9.1	31.3	34.5	x	
57. Morocco	3.4	30.4	33.4		
58. Bulgaria	29.3	31.6	30		
59. Nepal	80.2	97.4	<30	x	
60. Burundi	96.3	96.6	<30	x	
61. Malawi	70.8	95.3	<30	x	
62. Niger	14.4	76.4	<30	x	
63. Ethiopia	29.9	69.3	<30	x	
64. Kenya	29	63.4	<30		
65. Burkina Faso	35.1	61.7	<30	x	
66. Bhutan	31.2	60.8	<30	x	
67. Madagascar	15.7	56	<30	x	
68. Comoros	59	54.2	<30	x	x
69. Tanzania	27.7	53.7	<30		
70. Somalia	15.4	53.3	<30	x	
71. Senegal	10.1	52.9	<30		
72. Grenada	52.1	52.1	<30		x
73. Lesotho	52.4	50.5	<30	x	
74. Afghanistan	7.2	46	<30	x	
75. Cameroon	9.2	42	<30		
76. Fiji	20	42	<30		x
77. Togo	61.2	39.3	<30	x	
78. Zimbabwe	10.1	39	<30		
79. Congo, Rep. of	1.9	38.8	<30		
80. Benin	37.2	38.6	<30	x	
81. Belize	19.8	38.2	<30		
82. Sierra Leone	13	35.7	<30	x	
83. Mali	2.9	29.6	<30	x	
84. Lebanon	19.2	29.2	<30		
85. Uganda	27.5	26.6	<30		

Annex IV. List of US-based foundations with international activities in areas potentially relevant to adaptation

The list below includes US based private foundations with international activities in areas potentially related to adaptation. It is based on the list of top 100 US grant-making foundations ranked by total giving, based on the most current audited financial data in the Foundation Center database as of June 28, 2007.

Name of Foundation	Total Giving per year (latest available information)	Work areas potentially relevant to adaptation to climate change
Bill & Melinda Gates Foundation	\$2,845,654,000	Health, agriculture, financial services to the poor
The Ford Foundation	516,907,177	Community development, education
Lilly Endowment Inc.	427,465,199	Community development, education
Gordon and Betty Moore Foundation	218,758,756	Biodiversity Conservation in the Andes, Brazil/Guiana, Melanesia, and Madagascar
The William and Flora Hewlett Foundation	211,762,000	Education, support to poorest farmers
The Andrew W. Mellon Foundation	199,339,831	Conservation and the Environment program
John D. and Catherine T. MacArthur Foundation	191,117,977	Conservation, development, migration, health
The Starr Foundation	159,130,952	Education, health care, public policy, environment
The Kresge Foundation	149,831,151	Philanthropy building, education in developing countries
The Rockefeller Foundation	111,083,354	Climate change, adaptation, development, agriculture
Open Society Institute	78,441,638	Economic development. Governance, health
Carnegie Corporation of New York	69,427,985	International development, Africa
Citi Foundation	68,436,019	Building communities, education
ExxonMobil Foundation	63,660,965	Environment, health, community development
The JPMorgan Chase Foundation	56,786,083	Community development
The Michael and Susan Dell Foundation	56,238,527	Microfinance, education, health
Intel Foundation	43,102,949	Community work in developing countries
The Merck Company Foundation	41,596,595	Health, environment

Source: Adopted from the Foundation Centre information on the top 100 US-based foundations ranked by total giving.

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Glossary

Adaptation	Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation (IPCC TAR, 2001)
Adaptive capacity	The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. (IPCC TAR, 2001)
Resilience	Amount of change a system can undergo without changing state. (IPCC, TAR, 2001)
Vulnerability	The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity. (IPCC TAR, 2001)
Mainstreaming	Mainstreaming refers to the integration of adaptation objectives, strategies, policies, measures or operations such that they become part of the national and regional development policies, processes and budgets at all levels and stages (UNDP, 2005).
Mal adaptation	Any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead. (IPCC TAR, 2001)

Acronyms

CDM	Clean Development Mechanism
COP	Conference of Parties
DAC	Development Assistance Committee under the OECD
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GNI	Gross National Income
ISDR	International Strategy for Disaster Reduction
LDC	Least developed Countries
LDCF	Least Developed Countries Fund
MDG	Millennium Development Goals
NAPA	National Adaptation Programme of Action
NWP	Nairobi Work Programme on impacts, vulnerability and adaptation to climate change
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Polluter Pay Principle
SCCF	Special Climate Change Fund
SD	Sustainable Development
UNCBD	UN Convention on Biological Diversity
UNCCD	UN Convention to Combat Desertification
UNFCCC	UN Framework Convention on Climate Change
WHO	World Health Organization
WMO	World Meteorological Organization