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**CLIMATE CHANGE, ADAPTIVE CAPACITY AND SUSTAINABLE
DEVELOPMENT**

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1. Introduction

This background note is a contribution to the informal expert meeting on Development and Climate Change that will be hosted by the Organisation for Economic Co-operation and Development (OECD) in Paris on 13 and 14 March 2002. It aims to inform participants in the meeting of three recent developments in adaptation science that may be relevant to the OECD and its member states as they consider adaptation to climate change in the context of sustainable development.

The three issues briefly discussed in this note are the following:

- Results of the workshop “Enhancing the Capacity of Developing Countries to Adapt to Climate Change” (Potsdam, Germany, 30 September – 2 October 2001);
- A discussion of the international funding of adaptation activities following the seventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (Marrakech, Morocco, 29 October – 9 November 2001);
- The methodology of a recent study commissioned by the German Federal Ministry for Economic Co-operation and Development (Klein, 2001).

The paper concludes with a section outlining a number of issues for consideration by the Development Assistance and Environment Policy Committees of the OECD, particularly in relation to their plans to conduct case studies as part of the project on Development and Climate Change.

2. Enhancing the capacity of developing countries to adapt to climate change

The countries and communities most vulnerable to climate change are those that are highly exposed to hazardous impacts and have limited adaptive capacity. Adaptive capacity is the ability to plan, prepare for, facilitate and implement adaptation measures. It is determined by factors such as economic wealth, technology, information and skills, infrastructure, institutions, equity and social capital. There is an urgent need to better understand adaptive capacity, how it relates to vulnerability and sustainable development and how it can be effectively enhanced. Without such understanding countries run the risk of making ill-advised adaptation investments that do not produce benefits as effectively or efficiently as intended or which are even counterproductive.

The Potsdam Institute for Climate Impact Research and Stratus Consulting (United States) organised a workshop to develop a research agenda targeted at the adaptive capacity of developing countries. The workshop brought together 45 experts from developing and industrialised countries, non-governmental organisations and donor organisations. The research agenda, as well as an edited book volume, will be presented at the World Summit on Sustainable Development (Johannesburg, South Africa, September 2002). The workshop was made possible through sponsorship from the World Bank, the Electric Power Research Institute (United States), the Canadian International Development Agency, the German Federal Ministry for Economic Co-operation and Development / Gesellschaft für Technische Zusammenarbeit and the United Nations Development Programme. Additional support was provided by Environment Canada, the Netherlands Climate Change Studies Assistance Programme, the Organisation for Economic Co-operation and Development and the United Nations Environment Programme.

The research agenda developed at the workshop is framed around six questions, which reflect the importance to “mainstream” adaptation to climate change in sustainable development activities. The six questions are the following.

- How does vulnerability to climate change manifest itself and how should it be defined and assessed to identify adaptation requirements?
- How and in what forms does adaptation to climate change occur, what processes and actors are involved and how can it be modelled?
- What constitutes an enabling environment for implementing adaptation options, what is the role of social capital and how can it be enhanced?
- How can adaptation to climate change be integrated into sustainable development and how can synergies with other policy objectives be created?
- How can priorities for adaptation to climate change be set?
- How can the research capacity and intellectual capital of developing countries be effectively strengthened to address adaptation to climate change?

To answer these questions requires a long-term and concerted effort in which academics, policymakers and other stakeholders need to work together. At the Potsdam workshop the World Bank took the initiative to set up the Vulnerability and Adaptation Resource Group (VARG), which aims to facilitate the operationalisation of adaptation to climate change through assessment, synthesis and dissemination of existing information and the identification of knowledge gaps. The VARG intends to advance the understanding of how to integrate best practices of adaptation into the development process.

Case studies will be particularly important in developing practical knowledge on the process of adaptation, as well as on the barriers and opportunities to enhancing adaptive capacity. The design of the case studies needs to ensure that results contribute not only to specific policy questions but also help to improve the broader understanding of adaptive capacity. In other words, case studies should contribute to meeting both policy and academic objectives.

3. International funding of adaptation activities

The identification of human-induced climate change as an actual rather than a theoretical phenomenon has increased recognition of the need to prepare for adaptation. The seventh session of the Conference of the Parties (COP-7) to the United Nations Framework Convention on Climate Change (UNFCCC) has adopted a number of decisions relating to adaptation in developing countries. These decisions build on earlier COP decisions, as well as on the UNFCCC proper. The UNFCCC contains a number of Articles that refer to adaptation and adaptation funding. Article 4.1(b) of the UNFCCC commits Parties to:

“Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures (...) to facilitate adequate adaptation to climate change.”

The financing of adaptation measures is addressed in Article 4.3, which states that:

“The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources (...) needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this Article (...).”

For developing countries that are particularly vulnerable, Article 4.4 of the UNFCCC contains another, more explicit, commitment to financing adaptation measures:

“The developed country Parties and other developed Parties included in Annex II shall also 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.”

The Global Environment Facility (GEF) is the international entity entrusted with the operation of the financial mechanism of the UNFCCC. Until recently, the focus of the GEF has been primarily on mitigation of climate change but following COP-3 and COP-4 adaptation has risen on the priority ladder. The types of adaptation activities to be considered by the GEF were already classified at the tenth session of the Intergovernmental Negotiating Committee of the UNFCCC. Its decision was endorsed at COP-1 in Berlin in 1995 (Decision 11/CP.1). The decision identifies three stages in the adaptation process:

- *Stage I*—Planning, which includes studies of possible impacts of climate change, to identify particularly vulnerable countries or regions and policy options for adaptation and appropriate capacity building;
- *Stage II*—Measures, including further capacity building, which may be taken to prepare for adaptation, as envisaged by Article 4.1(e);
- *Stage III*—Measures to facilitate adequate adaptation, including insurance and other adaptation measures as envisaged by Articles 4.1(b) and 4.4.

According to the GEF Operational Strategy (GEF, 1996), Stage I activities could encompass the following:

- Assessment of national, regional and/or subregional vulnerability to climate change; where appropriate rely on related data-gathering systems to measure climate change effects in particularly vulnerable countries or regions and strengthen such systems as necessary; and identify a near-term research and development agenda to understand sensitivity to climate change;
- Evaluation of policy options for adequate monitoring systems and response strategies for climate change impacts on terrestrial and marine ecosystems;
- Assessment of policy frameworks for implementing adaptation measures and response strategies in the context of coastal zone management, disaster preparedness, agriculture, fisheries and forestry, with a view of integrating climate change impact information, as appropriate, into national strategic planning processes;
- In the context of undertaking national communication, building of national, regional and/or subregional capacity, as appropriate, to integrate climate change concerns into medium and long-term planning.

With respect to financing, Decision 11/CP.1 states the following:

“For Stage I, the Conference of the Parties (...) shall entrust to the Global Environment Facility (GEF) (...) the task of meeting the agreed full costs of the activities required by Article 12.1 of the Convention. This would include meeting the agreed full costs of relevant adaptation activities undertaken in the context of the formulation of national communications; such activities may include studies of the possible impacts of climate change, identification of options for implementing the adaptation provisions (...) and relevant capacity building.”

With respect to Stages II and III, Decision 11/CP.1 states that:

“Based on the outputs of the Stage I studies, as well as other relevant scientific and technical studies (...), the Conference of the Parties may decide that it has become necessary to implement the measures and activities envisaged in Stages II and III. (...).”

In line with this, Decision 11/CP.1 includes the provision that:

“If it is decided (...) that it has become necessary to implement the measures envisaged in Stages II and III, the Parties included in Annex II to the Convention will provide funding to implement the adaptation measures envisaged in these stages in accordance with their commitments contained in Articles 4.3 and 4.4 of the Convention.”

At COP-4 in Buenos Aires (1998) governments adopted Decision 2/CP.4, which states that:

“(...) the GEF should provide funding to developing country Parties to implement adaptation response measures under Article 4.1 of the Convention for adaptation activities envisaged in decision 11/CP.1, paragraph 1(d)(ii) (Stage II activities) in particularly vulnerable countries and regions identified in Stage I activities, and especially in countries vulnerable to climate-related natural disasters (...).”

In spite of this decision no additional funds were made available to the GEF to fund Stage II projects. In addition, no clear guidance exists as to which types of activities are eligible under Stage II, which constrains the development of proposals. As it became clear that such guidance would not be provided in the foreseeable future, countries and organisations have begun to give their own interpretations to the text of Decision 11/CP.1. A number of regional project proposals have been submitted to the GEF, aimed mainly at further adaptation assessment and the identification of adaptation needs. One such project that has received GEF funding under Stage II is “Assessments of Impacts of and Adaptation to Climate Change in Multiple Regions and Sectors” (AIACC), proposed jointly by the United Nations Environment Programme (UNEP), the Third World Academy of Sciences (TWAS) and the Intergovernmental Panel on Climate Change (IPCC).

With the completion of the negotiations on the Kyoto Protocol to the UNFCCC at COP-7 in Marrakech (2001) agreement has been reached on the establishment of three funds that are relevant to adaptation in developing countries:

- A Special Climate Change Fund;
- A Least Developed Countries Fund;
- An Adaptation Fund.

The first two of these funds would require additional funding from Annex II Parties via the GEF, whilst in accordance with Article 12.8 of the Kyoto Protocol the Adaptation Fund would be financed from the share of proceeds on the Clean Development Mechanism (CDM).

The text of the relevant COP-7 decisions seems to suggest that the three-stage approach of Decision 11/CP.1 is no longer the only guidance for adaptation funding. Decisions 5/CP.7 and 6/CP.7 list a number of adaptation activities that appear to go even beyond Stage III activities. For example, Decision 5/CP.7 states that the following activities shall be supported through the Special Climate Change Fund and/or the Adaptation Fund and other bilateral and multilateral sources:

- Starting to implement adaptation activities promptly where sufficient information is available to warrant such activities, *inter alia*, in the areas of water resources management, land management, agriculture, health, infrastructure development, fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management;
- Improving the monitoring of diseases and vectors affected by climate change, and related forecasting and early-warning systems, and in this context improving disease control and prevention;
- Supporting capacity-building, including institutional capacity, for preventive measures, planning, preparedness and management of disasters relating to climate change, including contingency planning, in particular for droughts and floods in areas prone to extreme weather events;
- Strengthening existing and, where needed, establishing national and regional centres and information networks for rapid response to extreme weather events, utilising information technology as much as possible.

The Least Developed Countries Fund is to be used in part for the development of National Adaptation Programmes of Action (NAPAs), in which least-developed countries (LDCs) can communicate priority activities addressing their urgent and immediate needs and concerns relating to adaptation to the adverse effects of climate change. As stated in Decision 28/CP.7:

“The rationale for developing NAPAs rests on the low adaptive capacity of LDCs, which renders them in need of immediate and urgent support to start adapting to current and projected adverse effects of climate

change. Activities proposed through NAPAs would be those whose further delay could increase vulnerability or lead to increased costs at a later stage.”

It thus appears that COP-7 has removed a number of major barriers to international adaptation funding. Nonetheless, the activities listed in Decision 5/CP.7, as well as those to be identified in the NAPAs, can only be implemented if sufficient additional funding is made available.

Even if more money became available for the implementation of adaptation activities, two major barriers to the international funding of such activities remain. First, in line with Article 3.3 of the UNFCCC the GEF Operational Strategy prescribes that activities need to have global benefits in order to be eligible for funding. Mitigation activities, aimed at reducing atmospheric greenhouse-gas concentrations, clearly have global benefits. For adaptation activities on the other hand, it is difficult to imagine how global benefits can be produced. Adaptation takes place at the scale of an impacted system, which is regional at best, but mostly local.

Second, the GEF would not cover the full costs of adaptation (however defined). The GEF assumes that some development and upgrading of systems will take place irrespective of climate change. It would fund only the incremental costs of adaptation, which are the additional costs required to maintain a system climate-safe (*i.e.*, prepared for and able to cope with prevailing weather extremes). In theory, these costs can be estimated by comparing two impact scenarios: one with and one without climate change. By then comparing the costs of alternative adaptation options with their respective benefits one can determine the (economically) optimal option, which is the one with the highest benefit-cost ratio. In practice, however, estimates of the costs and especially benefits of adaptation to climate change are difficult to make.

Thus, its mandate requires the GEF to make a distinction between adaptation to a future, scenario-based climate change and adaptation to today's climate variability. Adaptation to climate change would be eligible for funding, whereas adaptation to climate variability is not. Both types of adaptation, however, are very similar by nature and they can mutually reinforce each other. For example, both types of adaptation would include protection against weather extremes and related hazards. Weather extremes occur independently of climate change but their magnitude and frequency of occurrence is likely to be affected as a result of climate change. Adapting to extremes that result from today's variability would be a good start to prepare for the extremes associated with a future climate.

Particularly if one accepts that human-induced climate change is already taking place, the distinction between the two types of adaptation becomes highly theoretical. It assumes that one is able to identify the relative contributions to weather extremes of human-induced climate change and natural climate variability. This is not only impossible but also immoral. The attribution question and related issues of funding eligibility are highly irrelevant to people who lose their lives or livelihoods as a result of weather extremes.

As far as the calculation of incremental costs of adaptation is concerned, this too requires information of a type that is not always possible to obtain. Incremental costs are the additional costs required to keep a system climate-safe¹. This definition assumes that systems that are subject to adaptation to climate change are already climate-safe. Alternatively, it assumes that it is the responsibility of the individual countries to make these systems climate-safe, using alternative—possibly their own—funds.

¹ The protection of a coastal area against storm surges by means of a seawall provides a simple case to illustrate what are the incremental costs of adaptation to climate change. The level at which the seawall should offer protection is essentially a policy decision and reflects the population density and the value of the land and assets in the area at risk of flooding. This protection level determines the design height of the seawall, which for today's storm-surge regime can be calculated using meteorological, morphological and hydraulic data and information. If one were to protect not only against today's storm-surge regime but also to prepare for a climate change induced sea-level rise, the design height of the seawall would have to be increased. The cost difference between a seawall that only offers protection against today's variability and a higher one that also prepares for sea-level rise reflects the incremental costs of adaptation to climate change.

In the example of Footnote 1 it is immediately clear what the incremental costs of adaptation to climate change are. However, reality is often not as straightforward. Adaptation is a process that can comprise a range of different legal, institutional, economic and structural measures. It involves information development and awareness building regarding the needs and opportunities to adapt, the planning and design of adaptation measures, their implementation in line with existing policy criteria and development objectives and the monitoring and evaluation of the adaptation performance. In addition, it requires the development of an enabling environment for implementing adaptation measures.

Thus, the range of measures countries may wish to take to adapt to climate change is much broader than only structural measures such as building a seawall. An adaptation strategy may include actions such as:

- Setting up a monitoring network to enable the early warning of weather-related hazards;
- Changing institutional arrangements to enhance the effectiveness of political decisions;
- Strengthening a country's legal system to improve compliance with existing regulations;
- Changing fiscal arrangements to provide adaptation incentives to the private sector;
- Supporting the role of non-governmental organisations to ensure public involvement in decision-making.

It is clear that measures like these would have benefits that go beyond those of adaptation to climate change. However, it is also clear that it will be impossible to determine the relative contributions of these measures to the various types of benefits. As a result, the incremental costs of adaptation measures that are less straightforward than building a seawall are difficult or even impossible to determine.

It goes without saying that the two issues sketched above will be a major constraint when it comes to providing funds for actual adaptation to climate change by the GEF (*i.e.*, beyond Stage III). The effectiveness of adaptation to human-induced climate change depends on a country's own initiative and ability to adapt to today's climate variability. If no funds are available for the latter type of adaptation, adaptation to climate change is unlikely to be successful.

The challenges outlined above are not limited to the GEF: very few projects have been initiated, funded and implemented with a specific focus on climate change as part of bilateral or multilateral programmes as well. However, bilateral and multilateral development assistance has the advantage of being potentially more flexible and thus more effective than the GEF in making funding decisions. The need for such flexibility pertains in particular to the distinction between climate change and climate variability and the related issue of incremental costs.

4. Adaptation to climate change as part of bilateral official development assistance

In preparing to meet its commitments under UNFCCC Articles 4.8 and 4.9 the German government requires a better and more complete understanding of the nature of adaptation to climate change, its characteristics, its process, its relationship to other forms of development co-operation and the needs and opportunities for investment. As a first step in a process to improve this understanding the German Federal Ministry for Economic Co-operation and Development (BMZ) initiated a study that pursued three objectives.

First, the study aimed to identify to what extent German-funded official development assistance already considers the risk of climate change, as well as opportunities for adaptation. To date no projects have been initiated in which adaptation to climate change is an explicit objective. However, as the successful management of natural resources is often affected by weather and climate variability (*e.g.*, droughts, storms), projects may have components that serve to reduce vulnerability to such variability and, in doing so, also to climate change. Thus, adaptation to climate change, whilst not an explicit objective, could be a secondary benefit of these projects.

Second, the study aimed to explore opportunities to incorporate adaptation to climate change in future German-funded ODA projects. Climate change is not the only problem facing developing countries and many other problems are perceived as more urgent. For adaptation to climate change to be effective, it needs to be integrated with ongoing ODA activities. In addition, synergies might be created with other environmental policies, such as those aimed at combating desertification and conserving biological diversity.

Third, the study was meant as a first step towards enhancing awareness of the needs and opportunities for adaptation to climate change amongst the staff of BMZ, the Gesellschaft für Technische Zusammenarbeit (GTZ), the Kreditanstalt für Wiederaufbau (KfW) and other relevant parts of the German government. By showing that it is not an abstract process but an extension of ongoing sectoral policies and activities aimed at long-term sustainability, it is expected that adaptation will be increasingly considered an important issue to be integrated in ODA projects.

The study, conducted by Klein (2001), focused on German-funded ODA projects in Africa, mainly aimed at technical co-operation in five different types of natural resource management. It served to give a first indication of the extent to which adaptation to climate change has been considered in the formulation and implementation of these ODA projects. Similar studies have been carried out by Van Rijn (1999) for The Netherlands and by Burton and Van Aalst (1999) for the World Bank.

The information necessary to fulfil the first of the above three objectives was obtained from a database used at GTZ to administer German ODA projects aimed at technical co-operation, as well as from interviews with experts and project managers in BMZ, GTZ and KfW. In the database, ODA projects are categorised in around 180 thematic areas, each with their own Creditor Reporting System (CRS) code. For this study five thematic areas were selected:

- Agricultural land resources (CRS 31130);
- Forest development (CRS 31220);
- Environmental policy and management (CRS 41010);
- Biodiversity (CRS 41030);
- Rural development (CRS 43040).

Project descriptions were analysed of all projects initiated in Africa since 1990 within these five thematic areas. This amounted to 136 projects in total: 29 on agricultural land resources, 24 on forest development, 15 on environmental policy and management, 26 on biodiversity and 42 on rural development.

Based on this initial analysis of GTZ project descriptions, four projects were selected for more in-depth analysis, including interviews with project managers or other relevant experts. One of the selected projects was a joint GTZ-KfW project, whilst a fifth selected project, not listed in the database, was co-ordinated by KfW only.

The interviews also served to provide information to fulfil the second and third of the aforementioned objectives of this study. In addition, fulfilling these objectives required a literature survey, aimed at understanding the process of project initiation and implementation at GTZ, as well as the priorities for other global environmental issues, especially desertification and biodiversity.

Based on the findings of Klein (2001) BMZ are now in the process of integrating adaptation to climate change into ongoing German ODA activities (so-called “mainstreaming”). Mainstreaming is considered a way to ensure the long-term sustainability of ODA investments and synergies are sought between climate adaptation, combating desertification and conserving biodiversity. Mainstreaming is also seen as a more efficient and effective use of financial and human resources than designing, implementing and managing adaptation programmes separately from other ODA activities. Finally, BMZ recognises the need to co-operate with other funding agencies, particularly the GEF, in adaptation investment.

5. Issues for consideration by the OECD

As stated before, case studies will be particularly important in developing practical knowledge on the process of adaptation, as well as on the barriers and opportunities to enhancing adaptive capacity. At the same time much practical knowledge already exists in projects that have not been initiated with climate change in mind but which do relate to adaptive capacity and sustainable development. Projects directed at natural resource management and natural hazard reduction may be particularly relevant in this respect. Information on approaches to institutional capacity building, participatory decision-making, economic instruments, legal frameworks and so on can be usefully assessed in view of its practical relevance and applicability to climate adaptation projects.

In addition, it will be useful to develop an inventory of activities that are currently being undertaken by other international organisations. The World Bank, the United Nations Development and Environment Programmes, the IUCN–World Conservation Union and the Federation of Red Cross and Red Crescent Societies are amongst the organisations that have initiated adaptation activities, some of which include case studies. A project jointly co-ordinated by the IUCN–World Conservation Union and the International Institute for Sustainable Development, which focuses on livelihood security of vulnerable communities in developing countries, may provide an excellent opportunity to collaborate on one or more case studies.

As stated, the design of the case studies needs to ensure that results contribute not only to specific policy questions but also help to improve the broader understanding of adaptive capacity. This requires the involvement of academic groups from a range of different disciplines, particularly from developing countries. A link with the GEF-funded project AIACC may be considered. The aim of this project, which involves research groups from 40 developing countries, is to strengthen research capacity by conducting innovative multisectoral and multinational studies of vulnerability and adaptation, including stakeholder involvement.

Finally, the OECD member states may wish to:

- Assess their own ODA activities to identify opportunities to integrate adaptation to climate change into ongoing sustainable development initiatives;
- Share relevant information amongst each other so as to be create synergies between different projects and avoid maladaptation;
- Develop a concerted strategy to complement the role of the GEF in light of the new international funding arrangements agreed at COP-7;
- Use the VARG as a vehicle to promote the above three activities.

References

- Burton, I.** and M. van Aalst, 1999: *Come Hell or High Water—Integrating Climate Change Vulnerability and Adaptation into Bank Work*. Environment Department Paper Series No. 72, The World Bank, Washington, DC, USA.
- GEF**, 1996: *Operational Strategy*. Global Environment Facility, Washington, DC, USA.
- Klein, R.J.T.**, 2001: *Adaptation to Climate Change in German Official Development Assistance—An Inventory of Activities and Opportunities, with a Special Focus on Africa*. Deutsche Gesellschaft für Technische Zusammenarbeit, Eschborn, Germany.
- Van Rijn, J.**, 1999: *Climate Change Adaptation in Netherlands Development Cooperation—Inventory of Activities*. Coastal Zone Management Centre Work Document 99.01, National Institute for Coastal and Marine Management, The Hague, The Netherlands.