

**ENVIRONMENT DIRECTORATE  
DEVELOPMENT CO-OPERATION DIRECTORATE**

**Working Party on Global and Structural Policies  
Working Party on Development Co-operation and Environment**

**EXPLORING LINKAGES BETWEEN  
NATURAL RESOURCE MANAGEMENT  
AND CLIMATE ADAPTATION  
STRATEGIES**

by

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## **FOREWORD**

This document is an output from the OECD Development and Climate Change project, an activity being jointly overseen by the Working Party on Global and Structural Policies (WPGSP), and the Working Party on Development Co-operation and Environment (WPENV). The overall objective of the project is to provide guidance on how to mainstream responses to climate change within economic development planning and assistance policies, with natural resource management as an overarching theme. Insights from the work are therefore expected to have implications for the development assistance community in OECD countries, and national and regional planners in developing countries.

Jan Corfee Morlot and Martin Berg of the OECD Environment Directorate, with input from Georg Caspary of the OECD Development Co-operation Directorate, organised an informal meeting of development and climate change experts to help guide the project (March 13-14, 2002 in Paris), and drafted this report.

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## Summary

1. The OECD organised an informal expert meeting on the Development and Climate Change Project 13-14 March in Paris. It was attended by about 20 invited experts, 6 government delegates (from both WP/GSP and WP/ENV) and several representatives of relevant inter-governmental organisations. The meeting included experts from both the climate policy community (largely adaptation experts) and from the development community. Participants were enthusiastic about the prospects for OECD contributions to assess, advance understanding of, and strengthen the linkages between climate and development policies, especially through the cross-cutting themes of natural resources management and adaptation policies.

2. The climate and development communities are often distinct and do not necessarily “speak the same language.” At a minimum, the project should advance an understanding between these two audiences and begin to establish a common platform for action in areas where the two sets of policy objectives intersect. An example of where progress seems likely is in the acknowledgement by both communities of the importance of factoring in climate change impacts and vulnerabilities when planning for development, with applications ranging from building institutions for better governance to re-orienting specific investments in physical infrastructure.

3. A number of real differences in perspectives exist among the two communities. For example, development policy interests tend to be driven by national demands (or “demand-driven”), whereas the climate change community tends to approach the policy problem from the supply side (e.g. policy packages involving support from industrialised countries to help developing countries adapt). Yet, the funds available to support adaptation will probably be less than what would be required to successfully limit vulnerability to climate change in any one locality or, more generally, across developing countries as a whole. A more powerful and cost-efficient solution over the longer term is likely therefore to be integrating adaptation (including the strengthening of adaptive capacity) into core development strategies.

4. Given that climate change is expected to affect the poorest developing countries relatively hard, a number of key questions emerge for development co-operation officials and their counter-parts in countries:

- How to enhance adaptation or adaptive capacity<sup>1</sup> through normal development plans and projects?
- What are the priorities for investment in adaptation or adaptive capacity?
- How should such priorities be determined by developing countries and donor communities?

5. Participants suggested that the OECD may have a unique role to work with the bilateral development co-operation community, especially given its capacity to convene these donors and formulate recommendations. Project results might be used to recommend how to “mainstream” climate change, or adaptation in particular, in development planning. Such recommendations could be based on other work underway in the OECD, in particular on development co-operation guidance on mainstreaming the Rio conventions on biodiversity, desertification and climate change into donor activities (OECD 2002a). This project might take this guidance a next step by providing detailed recommendations on how to address climate change more systematically, particularly with respect to natural resource management priorities, in

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1. Adaptation includes specific measures such as sea walls. Adaptive capacity is the ability to implement adaptations and is a function of such factors as wealth, access to technology, and institutional capacity.

the assessment of development strategies and development co-operation projects. In this context, the group also explored specific themes, including food security and coastal zone management challenges.

## **Background and introduction**

6. The OECD recently initiated a joint project on climate change and development. The project will focus on linkages between responses to climate change and economic development planning, with natural resource management as an overarching theme. Overseen by the Environment Working Party on Global and Structural Policies (WP/GSP) and the Working Party on Development Co-operation and Environment (WP/ENV), the origins of the joint project can be traced to the “OECD Informal High-Level Meeting on Climate and Development”, held in July 2000. The High Level Meeting brought together senior representatives of the development co-operation and environment ministries to discuss matters of common concern and concluded that joint work of this type could be fruitful and provide useful insights and guidance for both the development co-operation and the environmental policy communities.

7. A starting premise for the project is that development and climate policies imply a two-way relationship: choices about development pathways influence climate change; similarly climate change will influence development. The project is an attempt to test this “hypothesis” and to deepen our understanding of it.

8. The basic objective of the project is to examine the linkages between the two policy areas and to draw appropriate recommendations for OECD Members, in relation to both their development co-operation efforts and their climate change policies. Project results and recommendations should also assist non-Member countries to plan development in a way that exploits synergies between development and climate policies. The primary emphasis in this project is on adaptation policies.

9. Within this scope, the project seeks to map out the main areas where development policy choices play an important role in widening or narrowing the scope for climate-friendly development options. It may identify opportunities to combine development strategies with cost-effective climate change adaptation policies at the local, national and international levels. Finally, it could identify opportunities where such combined development and adaptation strategies can also enhance mitigation efforts (e.g. in the areas of forestry, agricultural and other land use management).<sup>2</sup>

10. An assessment of climate and development linkages could cover different clusters of issues. These include agriculture and food security issues; inland waterway and watershed management; coastal zone management; forestry; and human health.<sup>3</sup> Issues relating to energy supply and use will not be covered in this project, except as they directly relate to other natural resource management issues (e.g. biomass energy or fuel-wood questions in the case of forestry and land use management may be important). The narrowing of the scope reflects resource constraints, and will also help to ensure development of new policy insights for the more limited selected set of themes.

11. The work plan foresees three phases for the project. The first phase will develop a literature review, framework and work plan for the case studies by mid-2002. The second phase will carry out the

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2. These project aims and sub-aims have been modified slightly based on discussions in previous WP/GSP and WP/ENV meetings. In particular, these discussions clarified the limited coverage of mitigation options in this project. There may also be a need to narrow the number of specific themes to be covered during the case study phase.

3. Human health could include issues such as famine, risks of spread of vector-borne disease, and problems associated with poor water quality. It could also be considered a cross-cutting theme.

case studies. This phase is planned to begin later this year and run through to the middle of 2003. The final phase will produce policy recommendations and a final report by the end of 2003.

12. In February 2002, a draft literature review and a framework paper were commissioned from consultants. An informal expert meeting was convened in March 2002 to review and comment on preliminary drafts of these products and to provide suggestions for the next steps in the project. Drafts of the literature review and framework papers are currently in progress and are planned for public release later in 2002. Elements of the current versions of both papers are included below. Early results from the project also contributed to the OECD's preparations and report for the World Summit on Sustainable Development (WSSD) in Johannesburg (OECD 2002). In addition, results obtained from the project will be used to support the WSSD process itself (August 2002) and again during the follow-up period.

13. This report highlights the results of the expert meeting.

### Highlights of the informal expert meeting

#### *Development and natural resource management themes for analysis in the case study phase*

14. The workshop discussions identified adaptation and strengthening of adaptive capacity as the climate policy objectives of most relevance to natural resource management and development challenges. Adaptation must be seen as an on-going process that responds to different types of vulnerability at the local community level. In the case of human systems, adaptation can be either anticipatory or reactive (Figure 1 from IPCC 2001). For natural systems, adaptation may be reactive, but these systems may also require anticipatory measures, such as the creation of migration corridors. Thus, there is some scope for adaptation and development policies to increase the *resilience* of natural systems to climate change. Increasing this resilience would limit the vulnerability of a country, region or community to climate change, and would support sustainable development more generally.

**Figure 1. Matrix showing the five prevalent types of adaptation to climate change, including examples**

		Anticipatory	Reactive
Natural Systems		X	<ul style="list-style-type: none"> <li>· Changes in length of growing season</li> <li>· Changes in ecosystem composition</li> <li>· Wetland migration</li> </ul>
	Private	<ul style="list-style-type: none"> <li>· Purchase of insurance</li> <li>· Construction of house on stilts</li> <li>· Redesign of oil-rigs</li> </ul>	<ul style="list-style-type: none"> <li>· Changes in farm practices</li> <li>· Changes in insurance premiums</li> <li>· Purchase of air-conditioning</li> </ul>
Human Systems	Public	<ul style="list-style-type: none"> <li>· Early-warning systems</li> <li>· New building codes, design standards</li> <li>· Incentives for relocation</li> </ul>	<ul style="list-style-type: none"> <li>· Compensatory payments, subsidies</li> <li>· Enforcement of building codes</li> <li>· Beach nourishment</li> </ul>

Source: Based on Klein 1998; IPCC 2001.

15. There may be an important difference in the spatial scale and time frame of both the analysis of options and the necessary policy responses in the climate and development communities. While development plans and development indicators tend to be national, adaptation actions are also relevant at the local and regional scales, as well as at the national scale. Important differences may also exist in expected time frames for measurable results of investment. Development co-operation practitioners

require their investments to yield results in short-to-medium time frames, whereas climate policy typically aims to tackle longer-term problems, with longer-term results. These differences in the relevant spatial scale and time frame for the framing of policy could complicate the setting of common objectives or criteria to guide public investment strategies.

16. Participants identified a number of natural resource management or development sub-themes for possible investigation, including food security, agriculture, land use, watershed management and coastal zone management. When commenting on areas of importance for adaptation in their national communications, 85% of developing countries identified food security, 70% identified water resources, and 60% emphasised coastal zones.<sup>4</sup> A related issue is natural hazards, which already has a strong network of disaster management activities associated with it. This network could assist in establishing links between climate and development policies and their respective communities (Abramovitz et al. 2001). Coastal zone management also potentially combines many of the other themes outlined here.

17. Possible synergies also exist between adaptation and mitigation in the areas of forestry, agriculture and carbon sink enhancement. These synergies also extend to natural resources management objectives in the context of development. This theme is clearly within the scope of the project, however some participants noted that it should be considered among other priority problems for development, such as food security or water supply and quality.

18. A number of other areas may also be relevant for further work, but could also be the subject of separate projects on their own. These include the connections between climate change, biodiversity and desertification policy objectives, which are largely treated separately in international and national policy, even though they are clearly inter-related. Human health is also clearly relevant to food security, coastal zone and watershed management themes.

19. Climate change impacts are not high on the political agenda of most developing countries. Case studies, such as those proposed in this project, could raise awareness about available information on possible climate change impacts as well as about the notions of vulnerability and adaptive capacity. Though human societies have over the centuries gathered knowledge and experience about how to deal with climate change, it is likely that the rates and magnitudes of future change will exceed historical experience. Climate change impacts will also likely evoke unknown problems that cannot be solved with traditional knowledge. If implemented through a consultative process involving local stakeholders, planned adaptation could help to prepare communities to more effectively and efficiently respond to wider fluctuations in climate change (Virdin 2002). Thus, even where a rich literature may exist on climate impacts and vulnerability, local communities may not be aware of this experience, nor will they have necessarily applied it to improve their ability to cope with climate change. Active participation of developing country partners in the development of case studies may be key identifying opportunities to mainstream adaptation into development planning and projects.

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4. Personal communication from Youssef Nassef, UNFCCC Secretariat, commenting on the national communications received to date (March 2002).

*Adaptation financing issues*

20. Participants also considered how the UNFCCC process will support financing to assist with national adaptation priorities. Based on a decision outlined at COP1 in 1995, three stages of activities are eligible for adaptation funds through the GEF (UNFCCC 1995):

- *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.

21. In particular, the COP-7 decision on adaptation funding should lead to projects in least developed countries (LDCs) with urgent adaptation needs, beginning with the preparation of National Adaptation Plans of Action. An LDC expert group has been established to discuss funding issues and provide technical assistance to countries upon request. Guidelines should be ready by June 2002 for discussion at the upcoming Subsidiary Body meetings.

22. The GEF Secretariat organised a consultation with LDC representatives in February, and draft guidelines were prepared for review at the May meeting of the GEF Council and can be reviewed at the GEF website ([www.gefweb.org](http://www.gefweb.org)). Two governments, Canada and Ireland, have made contributions in advance of the formal approval of GEF arrangements and guidelines. The COP decision requests the GEF to report by COP 8 on its willingness to manage the funds, implying that limited activity can begin before the November 2002 meeting.

23. Compared to the situation for LDCs, even less consensus exists on how to advance funding to other developing countries (not LDCs) for adaptation. The Marrakech Accords also set up an Adaptation Fund and a Special Climate Change Fund, both of which should make funding available for adaptation activities. The Special Climate Change Fund is a voluntary fund supported by a commitment of some donors to begin by 2005. It has a commitment of \$450 million Euros but this includes contributions to the GEF climate change focal area and other climate contributions, such that the actual amount of new resources is not yet known. As funds can also be allocated to capacity building and technology transfer activities, there is a further uncertainty with respect to the amount to be available for adaptation. The Adaptation Fund will be supported by two per cent of the proceeds from Clean Development Mechanism projects, and the criteria for eligible (adaptation) projects is still to be determined. The GEF has been asked to administer these funds as well.

24. The scope of adaptation activities funded by the GEF has been defined by UNFCCC decisions and guidance to date (Klein 2002). While some developing countries have undertaken Stage I activities, work in Stage II has been funded for a limited (but growing) number of countries. Implementation of GEF funded adaptation projects has, for the most part, only just begun. Additional funding to undertake Stage II activities has been limited to a few countries due to Convention guidance that required that work be done on the basis of results provided in Stage I; yet most countries chose not to include Stage I in their first communications. However, the GEF is now supporting Stage I and II together in some projects.

25. A further issue has been the delay in reaching an expected Convention decision on guidelines for second national communications by developing countries, now expected to be decided at COP 8 (November 2002). As these guidelines may substantially revise the existing basis for support of national communications, the GEF has been reluctant to support additional communications in the interim.

26. The GEF is currently supporting several projects that include Stage II, including one for the Central America region that will attempt to produce methodologies and lessons for other regions. In addition, a new project pending for Argentina's second communication (to be reviewed by the GEF Council in May) also includes support of Stage II.<sup>5</sup> No guidance has so far been given to the GEF for support of Stage III activities, or with respect to funding of projects under the Adaptation Fund.

27. A further concern is the Convention requirement that support from the financial mechanism be provided on the basis of "agreed incremental cost" of global benefits, except in the context of support for national communications. The Convention also recently agreed that funding NAPAs for LDC should also be supported on the basis of full, rather than incremental cost. However, the GEF has had to address similar linkages between global and local benefits in other areas, particularly biodiversity and land degradation. The focus is typically on removing barriers to the global benefit through technical assistance or capacity building, and in the context of adaptation could include additional expertise or institutional capability necessitated by climate impacts. Thus, a project on understanding impacts of climate change on agriculture in Africa has already been funded on the basis of incremental costs, and institutional support related to climate change has been supported for the Caribbean region. The necessity for these approaches is evident in that full cost funding for adaptation projects (without respect to incremental cost or domestic benefit) could quickly amount to billions of dollars, and would exhaust the likely available resources from the new funds as well as existing GEF resources.

28. Connecting this Project directly to the formal debate on the financing of adaptation in the UNFCCC process could unnecessarily limit the scope of the work to a narrow set of questions. Alternatively taking a "development priorities" starting point (rather than a "climate priorities" starting point) may provide opportunities to identify and build on linkages between adaptation and development priorities through normal development lending. Debate and emerging guidance on adaptation financing will be relevant to the case studies. For example, the case studies might explore the meaning of what constitutes incremental costs for specific adaptation investments that could be layered into development projects or plans in the field of natural resource management. In this way, the results of the case studies may provide insights for concrete applications of such guidance.

#### *Framework for analysis*

29. Several concepts from contemporary environmental and social analysis are relevant for developing climate policies, and may also help to establish the framework for analysis in this project, including the concepts of durability, optimality, safe limits, carrying capacity, irreversibility, non-linear responses, and the precautionary principle (Munasinghe 2002). Broadly speaking, durability and optimality are complementary and potentially convergent approaches. For example, under the durability criterion, an important goal would be to determine the safe limits for climate change within which the resilience of global ecological and social systems would not be seriously threatened. The precautionary approach argues

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5. A major project which has recently received GEF funding under Stage II is "Assessments of Impacts of and Adaptation to Climate Change in Multiple Regions and Sectors" (AIACC). This project is being implemented by the United Nations Environment Programme (UNEP), and executed by the Global Change System for Analysis Research and Training (START) and the Third World Academy of Sciences (TWAS). See Annex 3 for more detail.

that lack of scientific certainty about climate change risks and vulnerabilities should not become a basis for inaction, especially where relatively low cost steps could be undertaken as a form of insurance – to facilitate both adaptation and mitigation efforts (UNFCCC 1993).

30. Workshop participants also discussed the proposed framework as a basis for future analysis. This approach attempts to combine optimality and durability objectives as an organising approach for further work in the project. Participants endorsed the notion that the framework needs to achieve an overall balance between economic, environmental and social objectives in any assessment of climate and development linkages. At the same time, some questioned the practical use of this “theoretical” approach in the context of this project. In this view, the proposed framework is too ambitious and would be difficult to put into practice, because it has not yet been developed fully as a self-contained methodology. A more user-friendly approach was therefore recommended -- one that can be applied to concrete policy problems, using many of the basic concepts and building blocks of the proposed approach, without being model-dominated.

31. Key elements of the framework that would facilitate work on the case studies, include (Munasinghe 2002):

- Emphasising that development comes first – i.e., starting from a development perspective, while recognising that climate change will affect future development paths and vice versa, with many complex and dynamic feedback mechanisms. Ideally, climate change policies should become a part of the overall sustainable development strategy.
- Focusing on ‘making development more sustainable’ – because improving the sustainability of existing development activities is a more easily achievable, relevant and practical goal, rather than striving to define the elusive topic of sustainable development.
- Integrating and balancing the social, economic and environmental dimensions of sustainable development using multi-disciplinary approaches, while acknowledging that these perspectives may differ among countries and communities.
- Recognising durability and optimality as complementary, integrative approaches, and identifying where they might be appropriately applied.
- Focusing on poverty, equity and economic growth on the development side and on vulnerability, impacts and adaptation on the climate side (including aspects of mitigation that are closely linked with adaptation).
- Applying tools, such as the action impact matrix (AIM) method, to assess the inter-linkages between development activities with climate change vulnerabilities, adaptation and impacts (on economic, social and environmental goals). Existing development documents (such as NSSDs, PRSPs and MDGs) and environmental documents (like NEAPs and climate change reports) are a good starting point to collate information. This process may also be a means to engage key stakeholders and promote consensus building among disparate communities. The process should identify key vulnerabilities and climate impacts in relation to development activities and focus attention on the most important issues, as well as detailed methods of analysing them. The results of the analysis, in turn, suggest action priorities and remedies to problems (including both synergies and trade-offs).
- Applying a range of sustainable development assessment (SDA) techniques to the priority issues identified during the AIM process. Specific methods include economic analysis (including cost-benefit, cost effectiveness, and multi-criteria analyses), environmental

assessment, and social assessment. Other case specific analytical methods and appropriate indicators of sustainability would also be used, to facilitate in-depth assessment of synergies and trade-offs between climate and development.

- Drawing appropriate conclusions for the OECD and donor community concerning priorities for future development assistance, including the strengthening of adaptation and adaptive capacity, and reduction of vulnerabilities among the most affected nations, sectors, systems, and communities.

32. Participants supported the view that development or sustainable development policies and strategies, rather than climate policy plans, would be the best starting point for this project. Specific suggestions include working from agreed national level sustainable development frameworks (e.g. Poverty Reduction Strategies (PRS)<sup>6</sup>; National Agenda 21 Plans; National and Environmental Action Plans; National Vision 2020, or any similar type of "sustainable strategies").

33. These frameworks are rooted in country-owned development objectives as well as internationally agreed goals, such as the Millennium Development Goals (see Box). Often developed in consultation with development co-operation agencies, they generally include a comprehensive analysis of socio-economic conditions, priority policy reforms, and relevant linkages between different sectoral policies and plans. These therefore provide important opportunities to integrate climate related issues in broader development policies and plans in a coherent manner and consistent with nationally-defined goals. They also serve to orient development co-operation investments to a country's own circumstances and characteristics. If these development plans could be combined with analysis of the implications for climate change vulnerability and of adaptation (or where relevant, mitigation) options, it may be possible to orient investments to areas or projects that will have multiple development and climate change benefits. At a minimum, the Millennium Development Goals could be a point of reference in designing the case studies (UN 2001).

<u>The Millennium Development Goals (MDG)</u>	
• 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, tuberculosis, malaria and other diseases
• Goal 7:	Ensure environmental sustainability
• Goal 8:	Develop a Global Partnership for Development

34. The existence of well-developed development plans, National Environmental Action Plans (NEAPs) or other comparable strategy could be a convenient criterion for case study country selection. It will yield possibilities for working with a set of countries with a wide variety of development levels, including many of the poorest (and hence, most vulnerable) countries, as well as countries with high level of "readiness" to address climate change within development priorities.

35. Tools, such as the AIM method, could be used in each case study to focus on natural resource management issues and the check whether impacts of development policies are consistent with objectives for sustainable natural resource management. Case studies might also consider whether vulnerability to climate change is increased or decreased through particular development policies or projects. The use of the AIM, or similar methods, could also be tested and further refined through the case studies as to help for identifying priorities for further assessment of how development policies interact in turn with the vulnerability and adaptive capacity.

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6. The PRSPs are part of the Heavily Indebted Poor Countries Initiative of the World Bank Group and the International Monetary Fund. As a precondition for debt relief, heavily indebted countries have to prepare a PRSPs (or at least an interim PRSPs). Consequently the PRSPs focus only on low-income countries, and do not yet exist for many developing countries (Annex 1). Some discussion of how well PRSPs are handling global environmental concerns is found in OECD 2002a.

**Table 1. A simplified preliminary Action Impact Matrix (AIM)**

<b>Activity/Policy</b>	<b>Main (Economic) Objective</b>	<b>Impacts On Key Sustainable Development Issues</b>			
		<b>Land Degr- adation &amp; Biodiversity Loss</b>	<b>Water Scarcity &amp; Pollution</b>	<b>Resettle- ment &amp; Social Effects</b>	<b>Climate Change Effects (eg., vulnerability and adaptation)</b>
<b>Macro- economic &amp; Sectoral Policies</b>	Macroeconomic and sectoral improvements	Positive impacts due to removal of distortions Negative impacts mainly due to remaining constraints			
<i>Exchange Rate</i>	Improve trade balance and economic growth	(-H) (deforest open-access areas)			(-M) (more vulnerable, less adaptive & mitigative capacity)
<i>Water Pricing</i>	More efficient water use and economic efficiency		(+M) (water use efficiency)		(+M) (less vulnerable, better adaptive capacity)
<i>Others</i>					
<b>Complementary Measures and Remedies<sup>2</sup></b>	Specific socio-economic and environmental gains	Enhance positive impacts and mitigate negative impacts (above) of broader macroeconomic and sectoral policies			
<i>Market Based</i>			(+M) (pollution tax)		(+L) (less vulnerable)
<i>Non-Market Based</i>		(+H) (property rights)	(+M) (public sector accountability)		
<b>Investment Projects</b>	Improve effectiveness of investments	Investment decisions made more consistent with broader policy and institutional framework			
Project 1 (Hydro Dam)		(-H) (inundate forests)		(-M) (displace people)	(+M, -L) (less fossil fuel use, more vulnerable)
Project 2 (Re-afforest and relocate)		(+H) (replant forests)		(+M) (relocate people)	(+M) (absorb carbon, less vulnerable)
<i>Other Projects</i>					

Source: adapted from Munasinghe and Cruz [1994] and Munasinghe 2002

Notes:

1. A few examples of typical policies and projects as well as key economic, environmental and social issues are shown. Some illustrative but qualitative impact assessments are also indicated: thus + and - signify beneficial and harmful impacts, while H and M indicate high and moderate intensity. The AIM process helps to focus on the highest priority economic social and environmental issues.

2. Commonly used market-based measures include effluent charges, tradable emission permits, emission taxes or subsidies, bubbles and offsets (emission banking), stumpage fees, royalties, user fees, deposit-refund schemes, performance bonds, and taxes on products (such as fuel taxes). Non-market based measures comprise regulations and laws specifying environmental standard (such as ambient standards, emission standards, and technology standards) which permit or limit certain actions ('dos' and 'donts').

*Extending the analytical framework to vulnerability and adaptive capacity*<sup>7</sup>

36. A key question is how to connect analysis of development and climate policy generally to a more specific consideration of options to limit vulnerability, increase adaptive capacity, and implement adaptation. Vulnerability depends upon exposure and sensitivity to climate change, and both depend on adaptive capacity. One can also consider vulnerability to multiple sources of stress, of which climate change is only one. Other sources of stress, for example, might be natural disasters or rapid declines in levels of economic activity (Downing et al. 2001; Yohe and Tol 2002 forthcoming; Smit et al. 2001).

37. Adaptive capacity has a number of determinants, many of which are also relevant to economic or other types of vulnerability (Yohe and Tol 2002 forthcoming). These include:

- Options for adaptation (each with a potential efficacy to help decrease exposure or sensitivity)
- Resources and distribution of resources
- Decision-making structure of institutions; access to decisions
- Social capital (also related to institutions and political processes)
- Human capital
- Access to risk spreading (broadly defined; not just insurance)
- Ability to process information; credibility; robustness
- Public perceptions

38. Starting with the first determinant, it is important to note that different adaptation or development options have different (intended and unintended) consequences on the targeted source of vulnerability (Yohe and Tol 2002 forthcoming). These options may also have different costs, impacts on crowding out, and rigidities of their own in terms of implementation. Some determinants operate on a micro-scale, that is, path dependent and location specific. Others are macro-scale, at the sub-national, national and supra-national region level. Some determinants depend upon the relationship between the micro-scale and macro-scale factors.

39. A suggestion was made to develop the analytical framework for the project's case studies so as to help think more systematically about location issues – for example, considering which locations are more vulnerable and why. This could be done at the sub-national regional level, the national level or even at supra-national regional level. Vulnerability of different locations could be assessed systematically by reviewing the strengths and weaknesses of adaptive capacity via the determinants outlined above. The project might also help to think more systematically about common “drivers” of macro-scale determinants of adaptive capacity in different geographic locations and at different scales. Superimposing thoughts about the determinants of adaptive capacity on the relevant indicators of sustainable development may highlight complementarities or conflicts, synergies and trade-offs or impediments for achieving multiple development and climate change benefits through the same investment or policy option (Yohe and Tol 2002 forthcoming).

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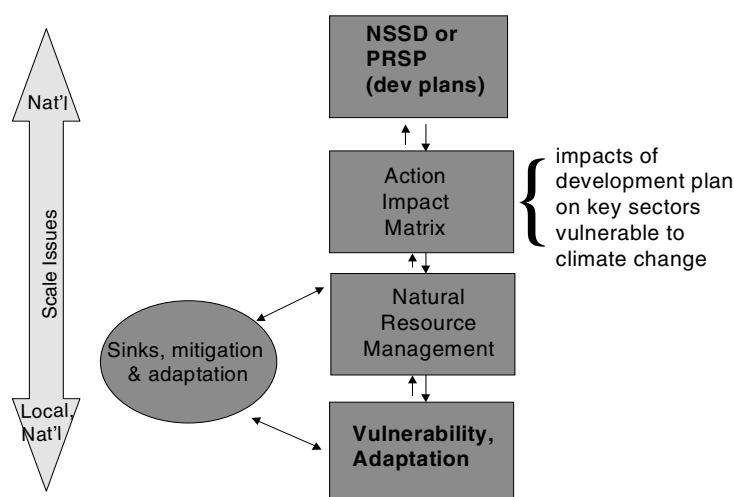
7. Many of the ideas presented in this section were discussed by participants in the break out group on analytical and quantitative approaches.

40. Such an assessment can be done with complicated models or through relatively simple "thought exercises"; within integrated assessment models or in the context of thinking about scenarios for "not implausible" futures (Strzepek *et al.* 2001 and Yohe *et al.*, 1999). Different types of actors could conduct this type of analysis, including analysts or policy-makers, drawing on information from UNFCCC National Communications and/or more informally from other relevant stakeholders.<sup>8</sup>

41. Vulnerability and adaptive capacity are also dynamic concepts and must encompass different visions of the socio-economic future across the economy, population, or a particular sector or location. Also, depending upon the issue selected, different scales of analysis may be appropriate. For example, if water quality and supply issues are to be studied, it would be appropriate to include a watershed management region, possibly a supra-national region, as the geographic unit of analysis. By contrast, analysis of food security (see below) may reasonably be assessed at the national or local level.

42. An overview of how one might link the various concepts from development planning to climate variability and adaptive capacity is outlined in Figure 2.

**Figure 2. Assessing the link between development plans and climate policy objectives through the natural resources management window**



#### *Approach to case study selection*

43. Participants considered possibilities for the structure and selection of case studies, either along the geographic or location specific lines, or along the lines of natural resource management themes. In the end, there was consensus that both approaches would be needed - any theme could not be explored in the abstract without a specific geographic context. Similarly, a case study on any particular country will need to deal with specific thematic issues of relevance.

44. Participants stressed that the best method could only be through "learning by doing," thus the need for full engagement of policymakers and other stakeholders in the particular country or region of study. There was some discussion about whether the most relevant stakeholders were to be found at the

8. Personal communication Gary Yohe, March 2002 meeting.

local level or at the national level. While most actions on adaptation or even development projects are implemented locally, it is essential to have recognition and engagement of national policy makers. Both local and national policy communities would need to be engaged if general policy recommendations were to be derived from the project. A key part of any consultative process will be to get the attention and the involvement of the (non-climate change) development community, which will only be possible at the national or sub-national regional level.

45. One recent study reviews development co-operation activities of a bilateral donor in Africa and identifies areas where projects may aggravate vulnerability to climate change, resulting in maladaptation. The same study also suggests that there are significant opportunities for orienting development co-operation investment to provide multiple adaptation and development benefits (Klein 2001). Some participants suggested that this study might be used as a prototype that could be extended to other donor portfolios, regions or even specific themes.

46. For selecting the case studies, an approach that would clearly fit with development co-operation priorities would be to focus on those countries that are most vulnerable to climate change. These would include the least developed countries, possibly small-island developing states, as well as perhaps more developed, yet highly vulnerable, countries. From the perspective of drawing robust conclusions from the project, however, it was seen to be important to have case studies drawn from a cross-section of countries with different levels of development and scales of vulnerability.

47. Priority natural resource sectors for attention could be food security, water and coastal zone management. Human health and insurance were seen as cross-cutting issues. Although insurance approaches to risk mitigation are likely to grow in importance in the negotiation process, it is considered to be beyond the scope of this project.

48. The meeting explored two clusters of natural resource theme in some depth – coastal zone management and food security (see Annex 2 and 3; see also Sari 2002, Viridin 2002 and Cannon 2002). Though not meant to be comprehensive or even necessarily the main themes for further work, looking more carefully at these themes helped to provide insight into possible ways to organise that work. Working through these examples also underscored differences in viewpoints between the climate change and development practitioners. Participants also considered specific suggestions for the analytical framework, especially with respect to how to work from macro-level and national development strategies to sub-national, local or project level assessment of the inter-relationship between development and climate adaptation policies and objectives.

49. Breakout groups on coastal zone management and on food security were asked to recommend a set of countries, regions or specific issues to be investigated that would yield generally applicable policy conclusions. They were also asked to identify suitable frameworks for analysis including recommending whether and how to conduct supplementary quantitative analyses. Finally, the breakout groups were tasked with providing suggestions about on-going or past studies from which the case studies might build. The results of the thematic breakout groups are summarised in Annexes 2 and 3. A third breakout group was convened on general (cross-cutting) quantitative and analytical frameworks.<sup>9,10</sup>

50. Limited resources will be available to the project to conduct the case studies, which implies the need to build on available information. At a minimum, sound information is required on development strategies, climate policies or plans and information on expected climate change impacts. Governments and

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9. The results from this group's discussion are integrated into the report above.

10. The Secretariat would like to thank Terry Cannon, John Viridin and Gary Yohe for leading discussions in the break out groups on Food Security, Coastal Zone Management and Analytical Issues, respectively.

other actors in developing countries will also need to be ready to explore linkages between development and climate adaptation policy. Both development and climate policy practitioners will need to be involved if a true exchange of ideas, viewpoints and greater understanding is to be achieved. Should sufficient funds for the case studies be available, using the studies to stimulate in-country discussion on the connections between development and climate policies would be valuable. Raising awareness about the need to anticipate climate impacts and to address vulnerability is also key to stimulating investments in adaptation. Coping with climate vulnerability could be a mechanism by which investments in adaptation could be linked to investments in other environmental, social or economic development objectives.

51. These suggestions are being explored in follow up to the expert meeting that is developing recommendations on how to proceed with the case studies phase of the project.

#### *Other relevant projects*

52. Participants agreed that the case studies should be based on on-going or finished projects so as to build on the results from other work. A variety of projects were mentioned and discussed briefly during the meeting and these are outlined briefly in Annex 4.

#### *Conclusions and wrap-up*

53. Experts encouraged the OECD to use the project to improve the understanding and the awareness among the development and climate change policy communities about issues of common interest. In particular, vulnerability, adaptive capacity and adaptation policies for climate change were endorsed as key themes to be explored. Agriculture, forestry and land use could also be addressed, allowing assessment of the possible synergies and trade-offs of combined climate mitigation/adaptation strategies and development policies.

54. Main conclusions of the expert meeting concerned the framework for analysis and principles for case study development. On the framework, experts suggested that it should start from well-accepted development planning tools such as national economic plans, PRSPs or NSSDs, although as discussed earlier in this paper only a limited number of completed PRSPs are available at this stage. Next, the analytical framework will need to address the interface between development and climate policies. The Action Impact Matrix (AIM), or similar methods, were endorsed as useful and practical tools that could identify connections between development plans and climate change policy objectives. Such qualitative assessments could be used to suggest priorities for action based on where synergies appear and remedies to problems where trade-offs appear. By concentrating this screening process on where natural resource management issues intersect with development priorities and climate change impacts, a further narrowing of the issues to be addressed in some detail in the case studies could occur.

55. Once priorities for action and trade-offs are identified, case studies will need to conduct a more careful assessment of where adaptation and development policies intersect. Looking at the determinants of adaptive capacity and vulnerability to climate change could be a way of testing available options for adaptation and their compatibility with development. The project case studies could also test how these determinants vary with location and with levels of development for specific natural resource management issues, such as food security, coastal zones or watersheds.

56. The meeting also recommended a number of principles for the design of case studies. These include the use of a consultative process and engaging both development and climate policy practitioners within a particular case study country. While desirable, a consultative process will clearly be more expensive than pure "desk studies" working with in-country consultant teams and would require revisiting

the budget and perhaps the time frame for the project. Final decisions will of course depend upon available resources.

57. It was also suggested that a geographic approach be used as the platform for structuring the case studies, in order to get the attention of the development community. It will also be necessary to include a cross-section of different types of countries, in terms of the level of development. Finally, case study countries or regions will have to be selected on the basis of available information. Given the limited resources and time frame for the project, there will need to be a strong information base both on the side of climate change (impacts and vulnerability information) and on the development side (development plans with relevant environmental information).

58. Once countries or regions of study have been selected, natural resource management issues can be usefully clustered to look at where adaptation policy options interact with development policies and priorities at the local, sub-national regional and national level. Food security and coastal zones are two possible clusters, though there are others (e.g. natural disasters or land use and forestry) that were not explored in any depth in the expert meeting.

59. At the international level, the project should focus on the broad question about how to mainstream adaptation planning and investment into “normal” development planning. In this way, it may provide insights for evolving UNFCCC guidance on how to prioritise projects and activities eligible for multi-lateral financing through the Convention process. In the end, the case studies will need to strike a balance between helping to build capacity, raise awareness and improve national and sub-national institutions to cope with climate change and getting relevant results and recommendations back to OECD Member countries.

**Annex 1: Poverty reduction strategy papers: progress to date by country<sup>11</sup>**

<b>Region/Countries</b>	<b>Poverty Reduction Strategy Papers (PRSP)</b>	<b>PRSP Preparation Status Report</b>	<b>Interim Poverty Reduction Strategy Papers (I-PRSP)</b>
<b><i>Africa (Sub-Saharan)</i></b>			
Benin		06-11-2001	26-06-2000
Burkina Faso	25-05-2002	14-12-2001	
Cameroon		31-01-2002	23-08-2000
Central African Republic			13-12-2000
Chad			16-07-2000
Cote d'Ivoire			29-03-2002
Djibouti			14-12-2001
Ethiopia			01-11-2000
Gambia, The		18-01-2002	05-10-2000
Ghana		25-02-2002	01-06-2000
Guinea			30-10-2000
Guinea-Bissau			01-09-2000
Kenya			13-07-2000
Lesotho			01-12-2000
Madagascar			20-11-2000
Malawi			01-08-2000
Mali		17-12-2001	19-07-2000
Mauritania	13-12-2000		
Mozambique	01-10-2001		16-02-2000
Niger	31-01-2002		06-10-2000
Rwanda			30-11-2000
Sao Tome and Principe			06-04-2000
Senegal			08-05-2000
Sierra Leone			21-09-2001
Tanzania	01-10-2000	14-12-2001	14-03-2000
Uganda	24-03-2000		
Zambia		16-11-2001	07-07-2000
<b><i>East Asia &amp; the Pacific</i></b>			
Cambodia		14-02-2002	01-10-2000
Lao PDR			20-03-2001
Mongolia			27-09-2001
Vietnam			14-03-2001
<b><i>Europe and Central Asia</i></b>			
Albania	21-02-2002		03-05-2000
Armenia			01-03-2001
Azerbaijan			01-05-2001
Georgia			01-11-2000
Kyrgyzstan			13-06-2001
Macedonia			10-11-2000
Moldavia			15-11-2000

11. See also OECD 2002a for discussion of the how environment is being addressed (or not) to date in PRS papers being prepared by countries.

Tajikistan			24-03-2000
<b><i>Latin America and Caribbean</i></b>			
Bolivia	01-03-2002		01-01-2000
Guyana			30-10-2000
Honduras	27-09-2001		01-03-2000
Nicaragua	13-09-2001		01-08-2000
<b><i>Middle East and North Africa</i></b>			
Djibouti			14-12-2001
Yemen			01-12-2000
<b><i>South Asia</i></b>			
Pakistan			14-12-2001

Source: <http://www.worldbank.org/poverty/strategies/index.htm> (02.04.02)

## Annex 2: Food Security Break Out Group

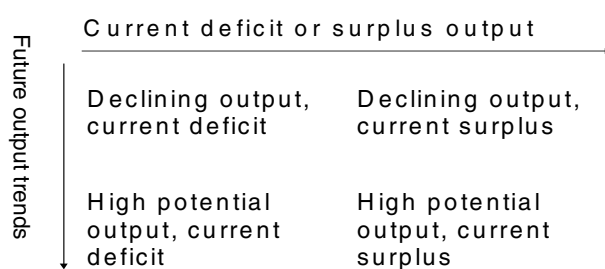
60. Suggestions made by the breakout group on food security rested on three general assumptions. Firstly, the group adopted a standard measure of food security as the balance between the estimated need for staple foods and availability at national level. In other words, the group agreed that food security is not only about (national) self-sufficiency but also about an adequate combination of national output and imports. Secondly, the group agreed that the main question about food security is whether certain groups of people are predisposed or more vulnerable to hunger on the basis of their inability to consume enough food, rather than inadequate availability of food in the country or region concerned. Hence, the recommendations made by the group are based on an understanding of vulnerability to hunger as inadequate consumption (also known as entitlement insecurity) rather than as inadequate availability of food (also known as food insecurity). Thirdly, the group aimed to take into account all sub-systems of the food system, which may impact upon entitlement insecurity. This includes production, exchange, distribution, and consumption. Climate change is likely to affect each of these in different ways.

61. The Group suggested that food security case studies should focus on agriculture. The main reason for this is that agriculture is the economic sector whose production conditions are most affected by climate change. In particular, the impact of climate change on output of food staples is likely to be significant, with wide regional differences in both increased potential and decreased output. Many of the countries most affected by physical impacts of climate change are also those that are likely to be the least capable of adapting.

62. The group suggested that the case study should focus on one or two crops, with one of these being a staple crop, the other a non-staple. The latter would enable the case study to also take into account the possibility of countries 'exporting their way out of trouble' using agricultural goods. (One participant of the breakout group took this idea one step further. Whatever the case study looked like, he suggested that it should look at a broad range of solutions for food security other than just self-sufficiency goals. This approach would take into account even non-agricultural ways of earning income for food imports and consider a broad range of possible 'development' solutions, including a complete switch in the national development strategy from emphasising agricultural to industrial production.)

63. If one case study were to be designed to cover the issue of food security, the group suggested to focus on about four countries, according to differences in the current situation for agricultural output and future situation taking climate change into account (see Figure 3).

**Figure 3. Four types of countries for a case study on food security and climate change**



64. The group members suggested to investigate the impact of climate change on the same crop in all four countries. It was highlighted in the Plenary discussion that while one crop should be investigated in every country, this needed not be the same crop in every country.

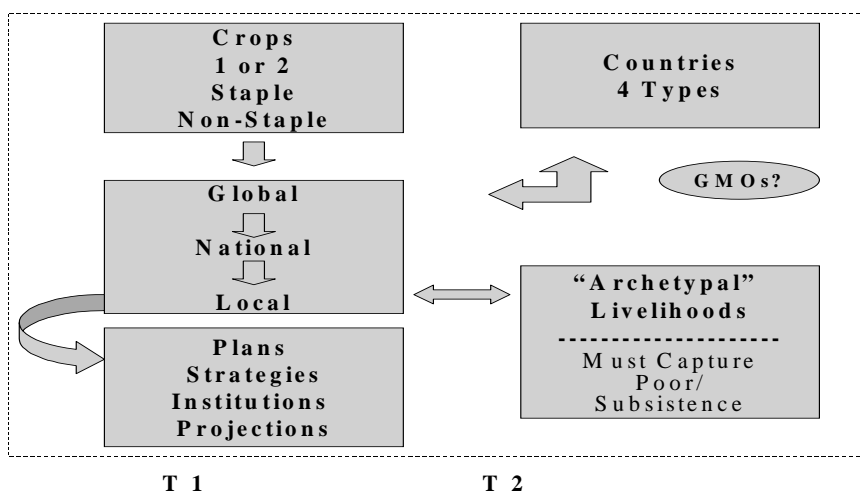
65. Participants suggested to look at climate change impacts on livelihoods at three levels:

- At the global level, the analysis should focus on constraining factors / structural factors, in particular OECD Market Access
- At the national level, the analysis should focus on the existence of relevant plans, strategies, institutions, as well as national climate change projections
- At the local level, the analysis should take into account local ‘archetypal livelihoods’, likely to vary according to location. ‘Archetypal’ livelihoods are the ‘central’ livelihoods typical for a particular country or region. This might be nomadic cattle herding in some African countries or hillside rice farming in some parts of Asia. It was agreed that it might be necessary to relax the one-crop scenario mentioned earlier to account for possible substitutes that might be applied at the local level e.g. in response to a climate-induced fall in yields for the ‘archetypal crop’.

66. Participants agreed that the case studies must aim to capture in particular the poor and subsistence farmers. The group also seemed to reach consensus that market solutions are unlikely to solve hunger problems even with a global food surplus, thus, any case study will also have to discuss governance solutions (co-operation; new institutions; new mechanisms for transfers).

67. Figure 4 outlines the building blocks for a case study on food security.

**Figure 4. Food security case study building blocks**



### **Annex 3: Coastal Zone Management Break Out Group**

68. The group agreed that coastal zones combine a variety of overlapping themes, which are equally important from the development and the climate change (CC) perspective:

- a large share of the world's population lives in coastal zones
- a variety of overlapping economic sectors and environmental issues are priorities for sustainable development (fishing, water, energy, biodiversity, agriculture)
- coastal zones are likely to be more vulnerable to climate change impacts than other areas

69. The discussion illustrated the different approaches used by development versus climate change experts towards an issue like adaptation. Experts underlined the discrepancy in timeframes for example, where the development community tends to rely upon a short-term approach and short-term results, while the climate policy community aims to prevent damages over the long-term. The need for development policy, and in particular ODA investments, to yield quick and measurable results is a sticking point for incorporating adaptation planning with relatively small near-term benefits, and larger long-term benefits, into such investments.

70. On the development side, all adaptation measures should address as many Millennium Development Goals (MDG) as possible.

71. A simple matrix with these goals on the one axis and climate change impacts on the other may help to consider how adaptation can be "mainstreamed" in standard development policies. Clearly any measures to reduce the vulnerability of coastal zones to climate change impacts will have to address development problems as well if their costs are to be justified.

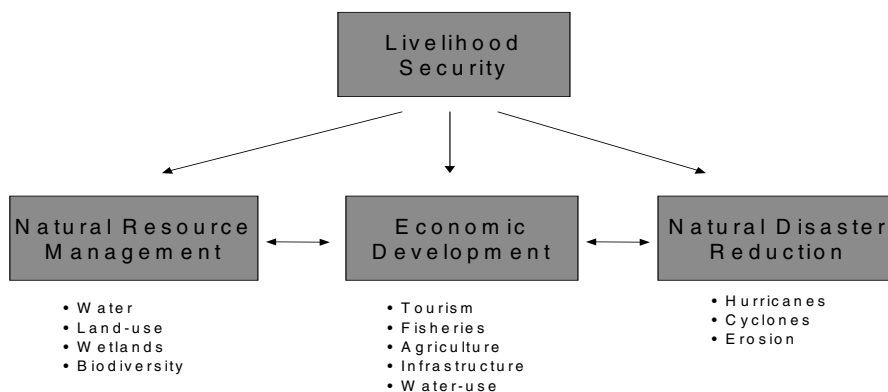
72. A contrasting view expressed by climate change adaptation experts is that this sort of "win-win" is too restrictive and it limits the range of adaptation options available. In their view, it may be more realistic to focus on one or two Millennium Development Goals, like poverty reduction and environmental conservation, which have clear synergies with investments in adaptation measures. Similarly, many adaptation options may have benefits for natural resource management and conservation and disaster mitigation objectives by targeting action and investment towards reducing vulnerability to current variability and extreme weather events.

73. To combine the different approaches the group concentrated on the overall objective of livelihood security. Achieving this goal is one of the main objectives of both the development and the climate community. In coastal zone regions, livelihood security can be promoted through three complementary types of activities (Figure 5):

1. Natural resource management (including water, land-use, wetlands, biodiversity)
2. Economic development (including tourism, fisheries, agriculture, infrastructure/settlements, water-use)
3. Natural disaster management (including measures to reduce the vulnerability to hurricanes/cyclones, storms/floods, coastal erosions)

74. The group suggested that at least one case study be designed to evaluate linkages and synergies between the three types of activity. In particular, the recommended case studies could be to seek to answer to the question: *How can coastal zones and their resources be managed, such that sustainable development is promoted, the vulnerability of coastal communities to climate extremes is reduced and the loss of livelihood is minimised?*

**Figure 5. Assessment of climate and development connections in coastal zone areas**



75. The group agreed that adaptation to current climate variability is one of the best ways to deal with longer-term expectations of climate change impacts and vulnerability. The case studies should focus how to target coastal zone management activities so as to promote both economic development and adaptation to climate change.

76. The group also briefly outlined some of the basic information needed to assess vulnerability to climate change and, further, to identify linkages and assess synergies between adaptation options and sustainable development in the coastal zone in question. Information needs include:

- key economic development plans and objectives
- current environmental and socio-economic stresses in the coastal zones regions
- potential impacts of climate change
- potential of socio-economics changes
- institutional arrangements and barriers to develop adaptive capacity

77. Ideally, two case studies would be undertaken, one in a high-density, coastal, urban setting and the other in a small island state. With limited resources, studies would need to use information from on-going or already finished projects. The discussion focused on quite a few areas and projects, e.g the “Land Ocean into Action in the Coastal Zones” (LOIZS) (see Annex 4). In order to “piggyback” on existing projects on coastal zones, some options would be:

- For a case study in a high-density, coastal, urban setting suggestions from the group included the East Coast of India (where some cyclone vulnerability studies are already available), the Philippines or Northwest Africa (e.g. the Dutch government has funded research in Senegal

and Gambia). Bangladesh or Sri Lanka are other possibilities as both have heavily populated coastal zones with significant vulnerability to extreme events and sea level rise. However there may be some places that are relatively “over-studied” and some felt that Bangladesh is in that category.

- For a case study in a small island state the group recommended a study in the Caribbean, such as in Trinidad and Tobago; it could build on information already available on adaptation strategies from the finished Caribbean Planning for Adaptation to Global Climate Change (CPACC) project (World Bank, forthcoming).

#### **Annex 4: Partial listing of other relevant projects**

##### *International Collaborative Project on Development and Climate*

78. The project is being initiated and managed by RIVM (overall co-ordinator), UNEP/RISOE (co-ordinator for energy issues) and IIED (co-ordinator for food security issues), but combines a variety of additional partners, notably from developing country research institutes. Its main goal is to bridge the gap between national development and climate change policies. By exploring with national stakeholders in developing communities the connections between development and climate change policies, the project tries to find ways to enhance global participation in the international climate change regime. Starting from development priorities, and it also will seek national strategies which meet development objectives and help control climate change at the same time. Finally the project also aims to strengthen analytical capacity in research institutions in developing countries.

79. By taking a development oriented approach, mitigation (development with low GHF emissions) and adaptation (development that reduces vulnerability to climate change) can be combined in a natural way. The project proposal focuses on two key issues (energy and food security/water availability) and on six key countries/regions (Bangladesh, Brazil, China, India, South Africa, West-Africa).

80. The project foresees two phases:

- The first one (May 2002 to April 2003) will concentrate on an analytical framework and the organisation of national and international dialogues. The framework will be based on a literature review exploring methods to link sustainable development to climate change.
- The second phase (May 2003 to April 2005) will establish full-scale national studies analysing long-term development strategies on energy and food security. It will involve actors, stakeholders and decision-makers in order to find examples of development actions that lead to positive results dealing with climate change and integrate strategies to meet development objectives and help control climate change.

81. The OECD is collaborating with the organisers, so that they may build on interim products from the OECD project (e.g. the literature review and the analytical framework for the case studies). The Secretariat has also been asked to join the Steering committee for this collaborative project.

##### *IUCN/IISD project*

82. The World Conservation Union (IUCN) and the International Institute for Sustainable Development (IISD) have initiated a three-year project aiming to reduce climate-related vulnerability of communities, particularly the poor and the marginalised (IUCN/IISD 2002). It has established an advisory *Task Force on Climate Change, Vulnerable Communities and Adaptation* to provide guidance on the use of environmental tools to reduce climate-related vulnerability. The Task Force is composed of a multidisciplinary group of experts from the fields of climate change, disaster reduction, sustainable livelihoods and environmental management and policy. The project aims to produce the following outputs:

- Case studies that improve understanding of the factors which shape vulnerability to climate-related disasters and climate change, and the options for adaptation within natural resource management policy frameworks
- Guidelines for reducing the vulnerability of communities to climate change and climate-related disasters, using environmental management tools
- A network of policy institutions for assessing sources of vulnerability of climate change and climate-related disasters

83. The three-year project foresees three phases:

- The *initial phase* includes preparing a conceptual framework and a web-based platform to improve access to information on climate change adaptation
- The *second phase* concentrates on case studies undertaken by local experts. Proposed studies include flooding in Bangladesh and El Salvador, droughts in India, and hurricanes in the Caribbean and Central America. Also some regional workshops should create a network of political institutions at the regional and national level
- *Phase three* will synthesise and evaluate the knowledge base in order to build a toolkit identifying environmental management actions to reduce vulnerability to climate change and climate-related disasters. This toolkit is meant to be useful for the governmental and intergovernmental agencies, vulnerability and adaptation researcher, conservation and humanitarian groups, and private investors

84. The first phase of the project is underway and expected to be completed in late 2001.

#### *AIACC project*

85. The Assessment of Impacts of and Adaptation to Climate Change in Multiple Regions and Sectors (AIACC) project is being implemented by UNEP, and executed by the Global Change System for Analysis Research and Training (START) and the Third World Academy of Science (TWAS). Funded by the GEF (\$ 7,5 million) and the Canadian International Development Agency (\$ 200.000) the project will include two activities:

- Regional studies. 20 three-year studies were selected via an expert peer-review process from over 140 pre-proposals submitted to AIACC. The purpose of the studies is to assess impacts and vulnerabilities and evaluate adaptation responses. The studies are distributed throughout Africa, Asia, Latin America, and Small Island States.
- Training and technical support for participants in the regional studies

86. The expected outcomes should enhance scientific capacity in developing countries for continued research on climate change impacts, adaptation and vulnerability

87. A kick-off meeting from 11-15 February, 2002 was hosted by UNEP in Nairobi, Kenya. Two training workshops are planned for this year and regional workshops will be held in 2002 and 2004. The workshops will provide opportunities for collaboration and transfer of knowledge and skills between participants from the different AIACC studies as well as for regional comparison and integration of results

from the individual studies. It is unlikely that the OECD Project will be able to build on these studies, since their results will not be available in the literature for at least another three years.

*CPACC project*

88. The Caribbean Planning for Adaptation to Global Climate Change (CPACC) project was completed in 2001. It was implemented by the World Bank with twelve Caribbean countries<sup>12</sup> with the aim of the project being to prepare these countries to cope with the adverse effects of global climate change. The project focused on sea level rise in coastal and marine areas through vulnerability assessment, adaptation planning, and capacity building linked to adaptation planning.

89. The Project is funded by the Global Environment Facility (GEF), implemented by the World Bank and executed by the Organisation of American States. The project is co-ordinated in the Caribbean through the Regional Project Implementation Unit (RPIU), which was established by the UWI Centre for Environment and Development (UWICED). A Policy Advisory Committee, chaired by the Caribbean Community (CARICOM), provided overall guidance for implementation of activities.

90. More specifically, the project assisted national governments to:

- Strengthen the regional capability for monitoring and analysing climate and sea level dynamics and trends, seeking to determine the immediate and potential impacts of global climate change
- Identify areas particularly vulnerable to the adverse effects of climate change and sea level rise
- Develop an integrated management and planning framework for cost-effective response and adaptation to the impacts of global climate change on coastal and marine areas
- Enhance regional and national capabilities for preparing for the advent of global climate change through institutional strengthening and human resource development; and
- Identify and assess policy options and instruments that may help initiate the implementation of a long-term program of adaptation to global climate change in vulnerable coastal areas.

91. The project description of 1997 and a variety of country/issue related reports are available at <http://www.cpacc.org>. A final project report is forthcoming (World Bank, 2002 forthcoming).

*The Land-Ocean Interactions in the Coastal Zone (LOIZS)*

92. The Land-Ocean Interactions in the Coastal Zone (LOIZS) project is one of eleven elements of the International Geosphere-Biosphere Programme (IGPB). Started in 1993, it focuses on the area of the earth's surface where land, ocean and atmosphere meet and interact. The overall goal of this project is to determine at regional and global scales:

- The nature of that dynamic interaction;

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12. Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad and Tobago

- How changes in various components of the Earth system are affecting coastal zones and altering their role in global cycles;
- To assess how future changes in these areas will affect their use by people and;
- To provide a sound scientific basis for future integrated management of coastal areas on a sustainable basis

93. The LOICZ Implementation Plan provides a blueprint of research and integrative activities ideal to fully meet the project goals. Achieving a truly global network of coastal scientists and the active participation of scientists from developing countries is vital to the ultimate success of this project. Whilst the objective of LOICZ is not to undertake coastal zone management, a clear goal is to provide a sound scientific basis for the future sustainable use and integrated management of these environments, under conditions of global change.

94. One of the core projects is the development of a coastal typology. A database has been established as the first stage. This data set and a variety of reports and studies are available at <http://www.nioz.nl/loicz/>

**Annex 5: List of Participants**  
DEVELOPMENT and CLIMATE CHANGE  
OECD Informal Expert Meeting, 13-14 March 2002

**INVITED EXPERTS**

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13. Mr. Agrawala joined the OECD Secretariat from 22 April 2002.

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## References

- Abramovitz, J. et al. (2001), "Adapting to Climate Change: Natural Resource Management and Vulnerability Reduction", Background Paper to the Task Force on Climate Change, Adaptation and Vulnerable Communities. World Conservation Union (IUCN), Worldwatch Institute, International Institute for Sustainable Development (IISD) and Stockholm Environment Institute/Boston (SEI-B), Gland, Switzerland
- Cannon, T. (2002), "Food Security, Development and Climate Change", Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris [[www.oecd.org/env/cc](http://www.oecd.org/env/cc)]
- Downing, Tom with R. Butterfield, S. Cohen, S. Huq, R. Moss, A. Rahman, Y. Sokona and L. Stephen (2000), *Climate Change Vulnerability: Linking Impacts and Adaptation*. Report to the Governing Council of the United National Environment Program. United Nations Environment Programme (UNEP), Nairobi and Environmental Change Institute, University of Oxford, Oxford. [[www.unep.org](http://www.unep.org)]
- Huq, S. et al. (2002), "Literature Review on Climate Change and Sustainable Development: With Emphasis on Vulnerability and Adaptation in Developing Countries", Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris
- IPCC (2001), *Climate Change 2001: Impacts, Adaptation, and Vulnerability*, Cambridge University Press, Cambridge.
- 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
- Klein, R.J.T. (2002), "Climate Change, Adaptive Capacity and Sustainable Development", Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris [[www.oecd.org/env/cc](http://www.oecd.org/env/cc)]
- Munasinghe, M. (2002), "Framework for Analysing the Nexus of Sustainable Development and Climate Change using the Sustainomics Approach", Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris
- OECD (2002a) *Integrating the "Rio Conventions" into Development Co-operation*, DAC Guidelines Series, Paris
- OECD (2002b), *Working Together towards Sustainable Development: The OECD Experience*, Paris

- Sari, A. (2002), “Summary of Impacts of Climate Change and Adaptation in Water, Agriculture, and Forestry Sectors in Indonesia”, Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris [www.oecd.org/env/cc]
- Strzepek, K. et al. (2001), “Constructing “Not Implausible” Climate and Economic Scenarios for Egypt”, in *Integrated Assessment 2*, 139–157
- Smit, B. et al. (2001), “Adaptation to Climate Change in the Context of Sustainable Development and Equity”, Intergovernmental Panel on Climate Change, *Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge et al., 877–912
- UNFCCC (1993), *Framework Convention on Climate Change: Agenda 21*, United Nations, New York, NY, USA
- UNFCCC (1995), *FCCC/CP/1995/7/Add.1*, Berlin
- Viridin, J. (2002), “Applying Principles of collaborative Management of Coastal Resources to Adaptation Planning and Implementation in Small Island States”, Paper presented for consideration and review to the participants of the OECD Informal Expert Meeting on Development and Climate Change 13 and 14 March 2002, Paris [www.oecd.org/env/cc]
- World Bank (forthcoming), “Final Report of the Caribbean Planning for Adaptation to Global Climate Change (CPACC) Project”
- Yohe, G. et al. (1999), “Spanning ‘Not Implausible’ Futures to Assess Relative Vulnerability to Climate Change Variability”, *Global Environment Change* 9, 233–249
- Yohe, G. and Tol, R.S.J., (forthcoming 2001), “Indicators for Social and Economic Coping Capacity – Moving Toward a Working Definition of Adaptive Capacity”, *Global Environmental Change*, 2002