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Nairobi work programme on impacts, vulnerability and adaptation to climate change

Information and views on socio-economic information

Submissions from Parties

1. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twenty-fifth session, invited Parties to submit to the secretariat, by 21 September 2007 information and views on matters relating to the availability of information on the socio-economic aspects of climate change and improving the integration of socio-economic information into impact and vulnerability assessments, including information on the development of socio-economic scenarios and for understanding adaptive capacity, including:

- (a) Existing approaches and available data;
- (b) Needs, gaps, barriers and constraints;
- (c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessments (FCCC/SBSTA/2006/11, para. 51).

2. The SBSTA requested the secretariat to compile these submissions into a miscellaneous document to be made available to the SBSTA by its twenty-seventh session (FCCC/SBSTA/2006/11, para. 52).

3. The secretariat has received six such submissions. In accordance with the procedure for miscellaneous documents, these submissions are attached and reproduced* in the language in which they were received and without formal editing.

* These submissions have been electronically imported in order to make them available on electronic systems, including the World Wide Web. The secretariat has made every effort to ensure the correct reproduction of the texts as submitted.

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* This submission is supported by Albania, Croatia, Serbia, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.

PAPER NO. 1: AUSTRALIA

Submission by Australia to the UNFCCC

Information and views on matters relating to the availability of information on the socio-economic aspects of climate change and improving the integration of socio-economic information into impact and vulnerability assessments, including information on the development of socio-economic scenarios and for understanding adaptive capacity, including:

- a) Existing approaches and available data;**
- b) Needs, gaps, barriers and constraints; and**
- c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessment.**

Australia welcomes the opportunity to share its views on the above issues, as requested at the twenty-sixth meeting of the Subsidiary Body for Scientific and Technological Advice. To ensure that material presented is relevant to the Nairobi Work Programme on Impacts, Vulnerability and Adaptation, this submission will focus on the socio-economic factors that affect climate change vulnerability and the socio-economic impacts of climate change, rather than the socio-economic drivers of greenhouse gas emissions.

The use of socio-economic analysis in Australia to inform climate change vulnerability and impact assessments is currently limited. We recognise the value of the insights gained from this analysis, and are in the initial stages of developing the technical and administrative capacity to underpin a systemic, national adaptation response which supports the generation of socio-economic data. This is a long term objective, however, and it may be several years before this data is available.

Existing Initiatives

To date, limited climate change research has been undertaken in Australia focussing on socio-economic issues.

Future socio-economic analysis in Australia will be guided and informed by our climate change risk management and vulnerability initiatives. We identified and prioritised our vulnerable regions and sectors in the *Climate Change Risk and Vulnerability Report: Promoting an Efficient Adaptation Response in Australia (2005)*.¹ Although its coverage of socio-economic issues is rudimentary, the sectors and regions identified in this report will be targeted in future socio-economic analysis.

We have also provided the tools for local governments, businesses and communities to prepare their own localised assessments, which may include socio-economic components. At the national level, the guide *Climate Change and Risk Management – A Guide for Business and Government*² outlines a risk management process which can be readily integrated into corporate risk management frameworks, and includes the identification of risks associated with socio-economic impacts. Australian state and local governments are also developing their own tools, such as *Adapting to Climate Change: A Queensland Local Government Guide*,³ which provides a process for local governments to assess climate change impacts (including basic socio-economic impacts) and plan a response.

¹ <http://www.greenhouse.gov.au/impacts/publications/pubs/risk-vulnerability.pdf>

² <http://www.greenhouse.gov.au/impacts/publications/pubs/risk-management.pdf>

³ http://www.lgaq.asn.au/lgaq/publications/LGAQ_Climate%20Change%20Adaptation%20Guide.pdf

National Climate Change Adaptation Framework

More detailed and consistent socio-economic information will be generated through the *National Climate Change Adaptation Framework* ('the Framework').⁴ This outlines the future agenda of collaboration between Australia's Commonwealth and state levels of government to address the demands from business and the community for targeted information on climate change impacts, and to fill critical knowledge gaps which currently inhibit effective adaptation.

Integrated, multidisciplinary, regional vulnerability assessments will be conducted under the Framework incorporating socio-economic analysis. A National Centre for Climate Change Adaptation ('the Centre') has also been established under the Framework, and allocated AU \$126 million over the next five years. The Centre, among other things, will consider the social and economic trends affecting climate change vulnerability, and the social and economic impacts of climate change through:

- Analysis of social and economic data and trends to assess how these factors are likely to influence vulnerability to climate change. Socio-economic scenarios will also be developed to provide decision makers with possible future situations to assist in assessing risk and developing adaptation strategies within appropriate timeframes; and
- Research to identify social and economic costs of climate change including the cost of not taking adaptation action.

The scientific research functions of the Centre will be coordinated through a new Climate Change Adaptation Research Facility ('the Facility'). This will be hosted by a leading science institution, and allocated up to AU \$50 million over the next five years. The Facility will lead the research community in a national inter-disciplinary effort to generate the social, economic and biophysical information needed by decision makers in government and in vulnerable sectors and communities to manage the risks of climate change impacts. The scientific outputs will be formulated in terms that decision makers can understand, and that can be utilised in a practical way.

Adaptation Flagship

The scientific research identified in the Framework will also be progressed through the CSIRO's AU \$40 million Climate Adaptation Flagship ('the Flagship'). The Flagship's proposed 'pathways to adaptation' research theme will involve national scale social and economic analysis of vulnerabilities and adaptation options to inform macro-scale socio-economic research on adaptation around where, when, who and how to adapt to climate change in a national context. Social issues such as what impedes constructive adaptation and what encourages uptake of opportunities will be an important part of this research area. Undertaking this analysis will require a better understanding of how to deal with risk and uncertainty, and the development of new approaches and methodologies for integrated assessments.

The Flagship's proposed 'liveable cities, coasts and regions' theme will focus on climate change exposure and adaptation options for our coastal areas and cities, including an assessment of regional dynamics. This, in turn, will draw upon integrated social, economic and environmental analysis, and assist communities, industry and governments to create options and incentives for adapting to the impacts of climate change at city and regional scales.

Australian Community Climate Earth-System Simulator

The climate and earth system simulator is being developed as a joint initiative of the Bureau of Meteorology and CSIRO, in cooperation with the Australian university community. The simulator will create models which are world-class, and enable Australia to meet the long lead-times necessary to contribute climate projections and scenarios of the Fifth Assessment Report of the Intergovernmental

⁴ http://www.coag.gov.au/meetings/130407/docs/national_climate_change_adaption_framework.pdf

Panel on Climate Change. It is anticipated that socio-economic processes will eventually be incorporated into the simulations.

Data Interface

As the socio-economic analysis conducted under the Framework grows, where appropriate, Australia would be pleased to share this information, and the methodologies used in its development. In particular, there may be scope for sharing relevant tools, methodologies and technical expertise with Pacific Island Countries. We could also learn from other Parties' experiences.

To facilitate Parties' access to socio-economic analysis and tools, Australia proposes that Parties consider whether appropriate information could be included in the Greenhouse Gas Data Interface. We acknowledge that there would likely be cost implications with this proposal, but consider that these may be outweighed by the benefits of sharing relevant socio-economic data, and of building upon one another's methodologies rather than developing these independently.

Conclusion

Australian research on the socio-economic factors affecting climate change vulnerability and the socio-economic impacts of climate change is currently limited. Further socio-economic analytical work will be progressed in coming years under the Framework, and we have committed a significant level of resources to ensure the effective implementation of this Framework. Australia would be pleased to share relevant socio-economic information, and the methodologies used to generate this, potentially through an expanded Greenhouse Gas Data Interface.

PAPER NO. 2: JAMAICA

SUBMISSION BY JAMAICA

Information and views on matters relating to the availability of information on the socio-economic aspects of climate change and improving the integration of socio-economic information into impacts and vulnerability assessments, including information of the development of socio-economic scenarios and for understanding adaptative capacity , including (a) existing approaches and available data; (b) Needs, gaps, barriers and constraints; (c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessments

Introduction

The Nairobi work programme on adaptation has invited information and views from Parties and relevant organizations on the above caption subject areas. This request is contained in FCCC/SBSTA/2006/L.26. Jamaica takes this opportunity to present mainly its views as the empirical information contained in the Initial National Communication is currently being updated and will not be completed until the end of 2008. It should be noted that this effort alone will not be sufficient in identifying all the problems that effects of climate change will have on the socio-economic activities of this country.

The absence of the updated information does not negate the well known and accepted fact that for all Small Island Developing states (SIDs) and low-lying coastal areas the effect will be of a negative consequence in general but particularly for those resources that are located within the coastal zone and are dependant on coastal activities.

Development of socio-economic scenarios for better understanding adaptative capacity

The development of socio economic scenarios is fundamental if Parties are to accurately determine the socio-economic impacts of climate change on their countries. A full understanding of these impacts is critical in efficiently determining a country's adaptative capacity.

Impacts will differ based on national circumstances and even countries with similar national circumstances will have different experiences. Therefore, the effective development of socio-economic scenarios will require a "bottom up" approach. Each scenario must be tailored to fit the national circumstances of each country.

Existing approaches and available data; Needs, gaps, barriers and constraints;

The existing approaches and the data that is available are based mainly on the national circumstances of developed countries or developing countries with well developed economies. These are unsuitable for Small Island Developing States (SIDS) whose landmasses are smaller in physical sizes and who do not have the elaborate datasets that are required to drive many of the existing approaches.

Ways and means to improve availability and access to relevant information including information on costs and benefits

There is the need for a survey to determine what approaches would be most suitable for SIDS and what would be the requirements in terms of datasets and how much more would be required for SIDS to match the requirements.

PAPER NO. 3: JAPAN

JAPAN

Submission to the Secretariat of the United Nations Framework Convention on Climate Change (UNFCCC)

Socio-economic information

The SBSTA invited Parties and relevant organizations to submit information and views on matters relating to the availability of information on the socio-economic aspects of climate change and improving the integration of socio-economic information into impact and vulnerability assessments. The Government of Japan welcomes this opportunity to submit the information on its work in this area.

a) Existing approaches and available data;

Japan low carbon society scenario toward 2050 project

This project focuses on the following issues: 1) long-term scenario development study to integrate environmental options consistently using simulation models, 2) long-term GHG reduction target setting considering effectiveness and validity, and 3) assessment of environmental options considering future socio-economic conditions in a) urban system, b) information technology (IT) society and c) transportation system.

Long-term environmental vision - scenario project for the Basic Environmental Plan of Japan

Japanese Basic Environmental Plan was revised in 2006, and one of important factors is formulation of policy measures from a long term perspective. Environmental policy as well as research must look at the problem from a long-term such as 50 years from now, imagine the vision of our society, and think about what we can do to realize it. The Ministry of Environment of Japan has developed such long-term vision and scenario and experts from various research fields are now contributing to such activity. Researchers in NIES are also contributing to development of this vision and scenario, especially quantification of feasible scenario using the integrated assessment model called AIM.

Comprehensive assessment of climate change impacts to determine the dangerous level of global warming and to determine appropriate stabilization target of atmospheric GHG concentration

Under this project, comprehensive assessment of climate change impacts in Japan and the Asia region is being conducted. In order to propose scientific findings regarding GHG emission paths to achieve stable GHG concentrations, and to investigate dangerous levels based on an understanding of quantitative overall impacts, we have organized the research framework in a strategic manner and implemented a comprehensive research approach. The objectives of this project are 1) to provide quantitative and definitive findings of climate change impacts in major fields, 2) to clarify the relationship between climate change impacts in Japan and stabilization of GHG concentrations, and 3) to propose GHG stabilization targets based on the view point of climate change impacts.

b) Needs, gaps, barriers and constraints;

Climate prediction and scenario including regional climate scenarios

In the Climate Change Research Program of NIES, one important research is to develop more sophisticated climate model for projection of future climate in more spatial and temporal detail of Japan and Asia region. The Earth Simulator is giving the climate modeling research community a powerful tool, and for the past some years, climate projection research has greatly progressed. Now researchers in Japan and Asian region are interested in such detailed future climate scenario for global warming impacts and adaptation study. We are now planning to distribute the climate scenario to them.

IPCC new emission scenario development

So far IPCC emission scenario is very basic information for us to proceed climate change impact and adaptation research. However we recognize some problems of IPCC current emission scenario. For examples, assumption of social and economical condition were not well reflected recent progress of global economic situation. Some researchers of NIES are heavily involved in this activity. We also have a research group on integrated assessment model, AIM: Asian Pacific Integrated Model. This model was used as one of six integrated assessment models for development IPCC emission scenario (SRES).

Scio-economic, and environmental scenario

In contrast to the climate change scenario, socio-economic and environmental scenario were not well developed. Some of key parameters such as population and economic growth are calculated and used for climate change impacts projection. However, land use and distribution of social facility data are not well developed so far. So development of such socioeconomic and environmental scenario and related basic data is very urgent work for further progress of climate change research.

c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessment;

Comprehensive impact and adaptation research project

This project is conducted by NIES and some other research organizations and universities. The impacts are analyzed and predicted using sophisticated impacts model, however economic estimate of damage in monetary term and necessary cost of adaptation have not been developed so far. Some research projects are now trying to quantify the impacts and damage of climate change and estimate adaptation measures in monetary term. It takes some time to develop such methodology and apply them.

Development of more sophisticated climate model including regional climate model and downscaling techniques

Both climate modeling groups and impact groups are well coordinated in this project. They are now conducting a research project on climate change modeling for extreme events.

PAPER NO. 4: MEXICO

Submission by Mexico

**Nairobi Program of Work on Impacts, Vulnerability and Adaptation to
Climate Change –
Socioeconomic Aspects**

21 September 2007

Mexico thanks the Secretariat of the UNFCCC and welcomes the opportunity to submit information and views on matters related to the availability of information on the socio-economic aspects of climate change and on improving the integration of socio-economic information into impact and vulnerability assessments, including information on the development of socio-economic scenarios and for understanding adaptive capacity, as mandated in paragraph 51 of the Nairobi program of Work on Impacts, Vulnerability and Adaptation to Climate Change.

(a) Existing approaches and available data

Mexico is a country that is particularly vulnerable to climate extremes. The El Niño or La Niña events, as well as extreme hydro-meteorological conditions, have caused serious damage and disasters in different socio-economic sectors in our country. Recent work in characterizing vulnerability to climate variability and change - to help understand the phenomenon, and to be able to discuss it inter-disciplinarily and with stakeholders, as well as decide on proposals for adaptation - highlights the progress Mexico has made both nationally and internationally.

For Mexico, one of the major challenges of adapting to climate change is to understand and characterize its vulnerability, while ensuring that the adaptation measures and policies chosen are compatible with the goals of sustainable development. Adaptation should be economically efficient, and adaptation options should be designed to contribute as much as possible to the objectives of the national economic well-being. Adaptation should also help in advancing toward social goals and should be environmentally sustainable.

The magnitude of climate changes and especially the specific impacts that a region will experience, are still a topic for study, because they depend on factors that are both physical and socio-economic, and that have so far been little explored. It is for this reason that, in generating future climate scenarios, integrated models need to be considered that would incorporate both the future emission of greenhouse gases, and global, national and regional socio-economic development variables.

So far, in Mexico, various climate models from large weather climate centers around the world have been down-scaled, and future climate scenarios have been produced for each of the SRESs developed by the IPCC, reinterpreted at the national level. A certain "climatology" is constructed using average conditions over thirty years. For this reason, it has been customary to analyze the periods 2010-2039, 2040-2069 and 2070-2099, referring to each of them as: the climatologies for 2020, 2050 and 2080.

If a set of projections from the General Circulation Models (GCM) and the dispersion in temperature and precipitation projections for the 2020, 2050 and 2080 climates are considered, it is found that, in general, Mexico's climate will be warmer (by 2 to 4 °C) around 2050. The results indicate that the most continental part of northern Mexico will experience the greatest increases in temperature. During the first decades of the 21st century, there are no marked differences if the emissions follow scenario A2 or B2. But after the 2050 climate, the differences will be more pronounced. Hence the importance of developing global mitigation strategies.

Climate information acquires a high socio-economic value whenever it is considered to be an element in decision making. Even with the lack of precision characteristic of a system of climate forecasting, seasonal prediction is a way to help, for instance, to reduce the negative impacts of droughts and floods.

Undoubtedly, in the face of a warmer climate with greater variability, adaptation actions will be required, including the use of climate information that integrates socio-economic variables. In Mexico, some steps have already been taken in that direction, but one of the greatest challenges is still, among scientists, government authorities, decision makers, and users of climate information in general, to develop the capacity to interpret and use climate diagnoses and forecasts for developing integrated adaptation measures.

(b) Needs, gaps, barriers and constraints

The following lines and topics of research and capacity building stand out among what has been set as national priorities:

- To analyze scenarios for Mexico with (at different stabilization ranges) and without mitigation, establishing the influence of factors such as population, economic development and deforestation in strategic regions. To extend the time horizon of integrated scenarios, at least to the year 2050.
- To develop and take advantage of climate change models and scenarios that include socio-economic variables more extensively, on time and space scales adapted to the needs of planning and decision making for adaptation strategies, for both local and sectoral measures, as well as for the protection of our country's rich natural and social diversity. And especially, to increase the capacity for modeling the phenomena and socio-economic impacts associated with water resources in the face of the climate changes that are expected in Mexico.
- To increase national capacity for the analysis of integrated scenarios of accelerated changes, including variables such as the temperature of the oceans, and those that can have irreversible effects on global natural phenomena, such as ocean circulation.
- To develop integrated models (from beginning to end) that will make it possible to produce the design of proposals and the implementation of adaptation measures.
- To develop and integrate a comprehensive study that analyses the interrelationships between climate change, society and the economy in Mexico. This work is being carried out by an interdisciplinary team, and will serve to strengthen the evidence base which supports climate change decision making, particularly for designing, assessing and implementing sound greenhouse gas mitigation and climate change adaptation strategies for Mexico.

(c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessments

In Mexico, the need to harmonize research related to climate change with the requirements of decision makers in the different sectors and at the three government levels (federal, state and municipal), has been emphasized, as well as the importance of being able to inform the population about the risks and the value of measures individuals can take to reduce GHG emissions, and reduce vulnerability, and to implement further actions for adaptation to climate change and variability.

Mexico has set as an objective to considerably increase socio-economic research into the climate change phenomenon, in particular to improve our knowledge of the socio-economic costs to be expected from hydro-meteorological phenomena in our country, as well as the costs and benefits of the alternative measures and policies for mitigation and adaptation.

The National Institute of Ecology, which is an environmental research institution of the Federal Government in charge of informing policy making and society in Mexico, has set up to carry out a comprehensive study of the “economics of climate change”, that would be crucial to sustain climate change mitigation and adaptation policies in the near future.

Mexico launched its first national strategy for climate change on May 2007, whose successful implementation would be greatly benefited from having a comprehensive and thorough analysis of the implications of the measures proposed both for society and for the economy. This analysis is necessary both for adaptation policies, but also for prioritizing mitigation strategies and possibly assume realistic and feasible greenhouse gases emission reduction targets for the country.

This study may focus particularly on key regions and sectors, possibly developing some specific case studies, for instance for border regions where local co-benefits of climate change policies are a plus, or for high-emitting sectors, like steel production. These questions and other specifics of the project are yet to be defined by the team of experts who will work on it.

Specifically, this project will look, in both the present and the future, at the implications of the economy and society on climate change, and also at the consequences that climate change and related policies for adaptation and mitigation have to society and the economy, and hence the feasibility and likelihood of success of these policies.

PAPER NO. 5: PORTUGAL ON BEHALF OF THE EUROPEAN COMMUNITY
AND ITS MEMBER STATES

**SUBMISSION BY PORTUGAL ON BEHALF OF THE EUROPEAN
COMMUNITY AND ITS MEMBER STATES**

**This submission is supported by Croatia, Turkey, Former Yugoslav Republic
of Macedonia, Albania, Ukraine and Serbia**

Lisbon, 21st of September of 2007

**Subject: Nairobi Work Programme on socio-economic aspects of impacts vulnerability
assessments and adaptive capacity**

Portugal, on behalf of the European Community and its Member States welcomes the opportunity to further contribute to the implementation of the Nairobi Work Programme by submitting information on socio-economic aspects of impacts vulnerability assessments and, and adaptive capacity.

1. Introduction

Under paragraph 69 of the Nairobi work programme (FCCC/SBSTA/2006/L.26, paragraph 39) on impacts, vulnerability and adaptation to climate change, the Subsidiary Body for Scientific and Technological Advice (SBSTA) invited Parties and relevant organizations to submit to the secretariat, by 21 September 2007, information and views on matters relating to the availability of information on the socio-economic aspects of climate change and improving the integration of socio-economic information into impact and vulnerability assessments, including information on the development of socio-economic scenarios and for understanding adaptive capacity, covering:

- a) Existing approaches and available data;
- b) Needs, gaps, barriers and constraints;
- c) Ways and means to improve availability and access to relevant information, including information on costs and benefits, as well as its better integration into impact and vulnerability assessments.

The IPCC Fourth Assessment Report acknowledges that vulnerability to climate change differs considerably across socio-economic groups and this raises issues of equity. It further notes that most studies of impacts tend to group countries or populations together and ignores differences within groups. Within a region, country or group of countries, certain factors will affect exposure to climate impacts or risks. These factors include income, age, gender as well as regional, national and sectoral groupings. Including this heterogeneity in impacts assessments will provide a much better estimate of the vulnerability of different groups within a society and not just society as a whole.

The EU recognises that whilst economic and technological development access to increases adaptive capacity and resilience, adaptive capacity can also be influenced by social factors such as human capital and governance structures. Policies on as trade liberalisation and social welfare influence adaptive capacity. For example during the European heat-wave of 2003, which impacted many wealthy European countries, the increase in deaths was mainly in the elderly, and within that, the poorer elderly. This illustrates that even within wealthy countries socio-economic factors affect vulnerability. Recent studies have also shown that poorer families are likely to suffer more after flooding, partly due to lower economic resources to enable them to move elsewhere.

Social trends and increased anthropogenic change of land surface (such as urbanisation, use of land for agriculture, deforestation, irrigation, building canals) can have far reaching impacts in both the urban and rural areas. The competition for use of land in urban, rural and natural areas can lead to inappropriate land-use planning with rapid transformation and construction of poor quality buildings, sometimes located on exposed areas, which are more vulnerable to damage from extreme weather. Meanwhile, rural areas suffer from a loss of the labour force which can result in an increase vulnerability to extreme events. Livelihoods in rural areas are also often more vulnerable to extreme events and the impacts on agriculture or forestry.

Recent studies show that it is no longer tenable to separate out the “social” from the “technical” aspects of climate risk management. Adaptation requires multiple approaches and disciplines and continued research can provide a wealth of information and data from the social sciences, offering alternative ways of constructing and framing climate risk management.¹

Understanding these societal trends is vitally important if we are to understand the potential impacts on different sections of society and develop effective and equitable options for adaptation.

2. Socio-economic aspects of vulnerability to the impacts of climate change

Understanding the potential impacts of climate change is critical. It is the justification for early action to avoid dangerous climate change and essential for managing the unavoidable impacts through adaptation.

Analysis to date, however, has tended to underestimate the scale of impacts by focusing predominantly on ‘economic growth’ and market driven effects that can be quantified e.g. impact on agriculture. The analysis needs to be broadened to address both the direct human and environmental impacts of climate change, and the ‘second-round’ socially contingent impacts such as social and political instability. Stern Review estimates of the total cost of business-as-usual climate change increased from 5% to 11% loss in global GDP when these direct impacts were included, rising to 20% if weighting is given to the disproportionate burden of impacts on poor regions of the world. This figure would likely increase considerably if the risk of socially contingent impacts were included (recognising difficulties in measuring these).

Although in global terms the countries of the European Union can be considered to have much in common, there are significant socio-economic differences within the region, and indeed within individual countries. The EU recognises that the severity of climate change impacts will vary greatly from region to region, depending on physical vulnerability, the degree of socio-economic development, social inequalities, natural and human adaptive capacity, health services and disaster prevention mechanisms. These differences will be even greater when considering the situation around the world. What is relevant for the EU may not translate directly to other regions. Socio-economic data can be helpful in identifying appropriate approaches for different regions.

Assumptions over the scope and cost, of adaptation are also important in assessing the impacts of climate change. The circumstances of each country, including its initial climate, socio-economic conditions, and growth prospects, will shape the scale of the social, economic and environmental impacts of climate change. For example, Ethiopia has less than 1% of the artificial water storage capacity per capita of North America, despite having to manage far greater hydrological variability. In this regard, it is widely acknowledged that the impacts of climate change will hinder the capacity for countries to achieve the Millennium Development Goals, thus constituting another serious barrier for human development.

¹ Defra/Environment Agency (2005), R&D Technical Report, Managing the Social Impacts of Floods.

Optimistic assumptions on adaptation – ignoring costs and difficulties of transition from one climate to another, the potential movement in people, or low adaptive capacity through poverty – result in an underestimation of the cost of climate change.

3. Activities at the level of the European Union

On 29 June 2007, the European Commission adopted a consultation document on adapting to the impacts of climate change. This Green Paper "adaptation to climate change in Europe - options for EU action", builds upon the work and findings of the European Climate Change Programme.²

The aim of the Green Paper is to launch an EU-wide debate on adaptation which will be concluded end 2007. Public consultation on the Green Paper started on 3 July with a major conference.³

Within the European Union and its Member States there is growing amount of knowledge available with regard to socio-economic aspects of climate change. The technical reports on "Vulnerability and adaptation to climate change in Europe" and "Climate Change and Water Adaptation issues" by the European Environment Agency highlights the vulnerabilities to climate change and adaptation activities in socio economic sectors; the PESETA project, coordinated by the Joint Research Centre of the European Commission, assesses the economic impacts of climate change in key sectors such as agriculture, health, coastal protection, river flooding and tourism; and the ADAM project also considers the development of scenarios.

4. Preliminary Conclusions

- a) The impacts of climate change will not be felt evenly across regions or society. Understanding the relative vulnerabilities of different social groups will be essential in the design of appropriate adaptation measures. Socio-economic information and scenarios can therefore provide valuable input to impact assessments.
- b) The availability of socio-economic information, in a form that can be readily understood will be important to support technical approaches, enabling planners and designers to get a more realistic view of the problems and suitability of solutions.
- c) Further development of socio-economic scenarios, coupled with climate change scenarios in terms of temporal range and spatial resolution, is a key issue for assessing impacts, vulnerability and adaptation. Socio-economic scenarios should include projections of land-use and land-use changes, in a geo-referenced way, downscaled properly to be used in the impact models.
- d) There is a need for guidance on merging climate and socio-economic scenarios. We feel that there is also a need to provide examples of case studies illustrating the value of using socio-economic scenarios.

² http://ec.europa.eu/environment/climat/adaptation/index_en.htm

³ http://ec.europa.eu/environment/climat/adaptation/green_paper/green_paper_en.pdf

- e) It is important to increase the awareness on socio-economic dimensions of climate change. The outcomes of climate change impact assessments are only relevant, in terms of vulnerability, in a socio economic context. However, changes in a socio-economic context are not well understood and will add more complexity and uncertainty.
- f) Improved understanding of the wide range of possible futures enables us to confront uncertainties and understand how adaptation decisions made now may play out in the future. It also helps planners to identify future priorities for adaptation that may not be evident at present.
- g) Scenarios should be realistic, challenging and relevant. It is therefore important that representatives for the end user group participate in the development of scenarios. Users will require scenarios for different purposes and will thus have different needs in terms of output and views on what is realistic, relevant etc.
- h) Healthy ecosystems and safe livelihoods are basic requirements for sustainable socio-economic development, and can strengthen the adaptive capacity and reduce vulnerability to climatic shocks and changes. However, the value of these services are not adequately expressed in the global market. We need to develop socio-economic scenarios that demonstrate the value of healthy ecosystems and safe livelihoods to effectively address the long term planning for adaptation.
- i) In certain areas and sectors socio-economic information is available and is used by a broad user-community. However, it is noted that lack of regional specific data, lack of training or lack in the communication between the producers of the scenarios and the end-users might be a barrier to their application.

5. Further work

The European Union believes that further efforts are needed to address the previous mentioned gaps, barriers, and constraints by continuous capacity building, especially for developing countries. To improve our understanding of the true costs of climate change further work and analysis is needed, including:

- a) Measuring the human and environmental impacts of climate change
- b) Measuring the risk of socially contingent impacts (e.g. conflict, migration)
- c) Measuring vulnerability (adaptive capacity and impacts)
- d) Understanding the true costs and benefits of adaptation (including transitional costs, uncertainty etc)
- e) Capturing income effects and distribution of risks
- f) Measuring the economic impact of variations in weather around mean trends in climate change: these can have lasting economic effects, especially if they fall on an economy already weakened by previous weather disasters or other shocks.
- g) Greater awareness and involvement of finance ministries in taking account of climate change in development planning.

The EU is looking forward to learn more about the views and experiences from other countries, addressing the issues identified in the above preliminary conclusions, and is willing to further discuss those under the Nairobi Work Programme.

Annex

Activities at the level of Member States relating to the subject of this submission

The following examples from Finland, France, Germany, the Netherlands, Spain, Sweden and the United Kingdom are neither exhaustive nor easy to compare but provide some insight into the specific circumstances in various member states and the approaches taken.

Finland

Long term socio-economic scenarios for Finland were prepared by the Government Institute for Economic research for the National Strategy for Adaptation to Climate Change. The primary purpose of the study was to combine existing estimates of the impacts of climate change and structural development factors of the economy into coherent compilations that can be used as a reference point in further studies assessing adaptation to climate change and the costs of prevention, rather than producing costs of adaptation. The study also provides background information for assessing the combinations of adaptation measures directed at different sectors. The calculations do not assume any active adaptation to climate change or assess the significance of adaptation measures.

Three scenarios were used: 'Basic scenario', 'Regressive Finland' and 'Alternative Finland'. The scenarios are combinations of assessments of the development of the global economy, the climate as well as Finland's economy and population. Estimates of climate impacts were based on available analyses which were not comprehensive.⁴

FINADAPT was a consortium that studied adaptation to the potential impacts of climate change in Finland. FINADAPT provides a set of three scenarios of environmental and socio-economic changes in Finland during the 21st century. These scenarios – 'Global markets', 'Retrenchment' and 'Sustainability' offer different perspectives of the future of Finland given certain assumptions about societal development and environmental change. The scenarios were designed to support the activities of FINADAPT partners by providing reference conditions for investigating future vulnerability to climate change and appropriate adaptation responses. FINADAPT covers the following topics: climate data and scenarios, biological diversity, forestry, agriculture, water resources, human health, transport, the built environment, energy infrastructure, tourism and recreation, a socio-economic preparatory study, urban planning and a stakeholder questionnaire.

As part of the FINADAPT study, socio-economic impacts of climate change for Finland were appraised (FINADAPT Working Package 12). This study looks into nine sectors and their climate impacts. Extreme events are also discussed. The study highlights, i.a. the need for integrated climate strategies which jointly address mitigation and adaptation policies.⁵

⁴ www.mmm.fi/ISTO (go to adaptation strategy)

⁵ <http://www.environment.fi/default.asp?contentid=227544&lan=EN> (both FINADAPT summary and Working Package reports) See also FINSKEN's climate scenario development http://www.fmi.fi/research_climate/climate_2.html

In the Climate Change Adaptation Research Programme ISTO there is some work on costs of impacts and adaptation. TOLERATE project aims to develop ways to assess what is a reasonable level of adaptation to avoid unacceptable disruption. The project studies, inter alia, to what extent are the current trends in economy, technology and institutional organisation aggravating the sensitivity of the studied sectors.⁶

France

The Observatoire national sur les effets du réchauffement climatique (ONERC) was created by law on 19th February 2001. Its activities cover the overseas departments and territories as well as mainland France. Its mission in short is to collect and disseminate information, studies and research on risks associated to climate change and extreme climate events, and to make recommendations on potential measures of prevention and adaptation in order to limit the risks associated to climate change. The observatory reports to the Prime minister and to the Parliament, and can communicate towards local communities. It provides a range of tools for adaptation planning, which can help local communities for a first approach of impacts assessment and adaptation planning. This includes indicators of observed climate change, local future climate change scenarios as well as a large documentation on climate. The Observatory contributes also to the dialogue with developing countries on the subjects of impacts and adaptation, in liaison with the French overseas departments and territories.

Research on climate change impacts and adaptation is ongoing in a large number of research organizations. France has two climate models, one developed by Météo-France and CERFACS (referred to as CNRM), and the other by IPSL, which mainly differ in their atmospheric components. Impacts studies have been made in virtually all sectors, including health, water, risks, forestry, agriculture and power generation.

The Government of France has adopted a National adaptation strategy in November 2006, which presents a vision on how to address the subject and sets an approach towards adaptation actions. The strategy is developed along 9 lines:

1. Develop scientific knowledge;
2. Strengthen the observation system, and ensure its operation on the long term;
3. Inform and motivate all stakeholders
4. Promote an approach adapted to local communities;
5. Finance adaptation;
6. Use legal instruments;
7. Encourage voluntary approaches and dialogue with private stakeholders;
8. Take into account the specific aspects of overseas territories;
9. Contribute to international exchanges.

A cross-cutting approach along 3 strands has been defined:

Sectors: agriculture, energy and industry, transport, buildings and habitat, tourism, banking and insurance;

⁶ www.mmm.fi/ISTO

Type of environment: urban, seashore and oceans, mountain, forest;
Resources: water, biodiversity, health, risks;

Adaptation plans which will contain more specific measures are under construction. An interministerial working group on the evaluation of the costs of impacts and adaptation has been set up, which should use all possible data available in the government and in the participating private entities in order to assess these costs.

Major progress on adaptation has already been made in the sector of public health, following the heat-wave of 2003. The National heat-wave plan makes use of meteorological information under clear specifications, in a partnership with Météo-France, and involves the whole hospitals and care system under precise procedures. The system is perennial and covers the whole country, many ministries, and is relayed by local plans, especially in large cities (e.g. Mairie de Paris)

More generally, many local communities are spontaneously engaging in the preparation of an adaptation plan, as part of their climate change plan : Région Aquitaine, Région Nord-Pas-de-Calais, Région Réunion, Région Rhône-Alpes, Ville de Paris, Agglomération de Nantes, Ville de Lyon,...

Overseas territories have been recognized as most vulnerable to Climate change, with an exposure similar on many aspects to the neighboring countries. The Région Réunion and Martinique have been most active in this respect, promoting meetings and information on adaptation and preparing an adaptation plan.

A conference under the title "The Caribbean in danger" was organised by the Conseil Général de la Martinique and ONERC in December 2006. This meeting showed the importance and potential of regional cooperation with EU support. It showed also the potential of cooperation with NGOs. A partnership will be pursued with IUCN (The world conservation union), in order to better take into account climate change impact on ecosystems. An international conference « Islands of Europe and the world facing ecological challenges » will be organized by ONERC, Conseil Régional de la Réunion and IUCN in 2008 in La Réunion.

Islands from the South-West part of the Indian Ocean are most vulnerable to climate change impacts, such as possible increases in hurricanes frequency and intensity, outbreak of infectious diseases, coral bleaching, sea level rise, decreases in fisheries stocks. The Fonds Français de l'Environnement Mondial (FFEM), together with the Ministry of Foreign Affairs and ONERC are starting a project concerning capacity building on impacts, vulnerability and adaptation in this region., which is presently under consideration of the islands members of the Indian Ocean Commission, including La Réunion.

Germany

Several activities in Germany take up the socio-economic aspects of climate change in an integrated approach. Foremost, the development process of a comprehensive National Adaptation Strategy towards climate change in Germany, which is to be passed by the cabinet by end of 2008, has to be mentioned. To assist with this task - including the provision of expert and environment policy support for the implementation of these measures - the Federal Ministry for the Environment, Nature Conservation and

Nuclear Safety has set up a “Competence Centre for Climate Impacts and Adaptation (KomPass ⁷) in the Federal Environment Agency in October 2006.⁸ The task of KomPass is to set up a network of expert knowledge on climate impacts and adaptation and make this available to decision-makers and to the general public. To ensure an adequate representation of socio-economic aspects, KomPass organizes a series of stakeholder workshops with participation from science, the business sector, public administration from various regions and from different levels of the German Federal administration, as well as other governmental and non-governmental organizations. Together with a clearing house mechanism (CHM) similar to the CHM of the CBD, KomPass will provide a bridge between science, the German Federal Government, the different levels of public administration, the general public and the business sector to adequately address the socio-economic aspects of climate change impacts in Germany.

The issue of specific socio-economic scenarios for climate change impacts in Germany is addressed in several studies for different sectors and different regions. To guarantee comparability with the scientific main stream research, most of these studies use the IPCC SRES scenarios as a baseline which is translated and downscaled to the local context. The general assumptions of the SRES scenarios are translated via a participative process of stakeholder workshops for the socio-economic sectors of interest (mainly agriculture, forestry and water related aspects). Based on these regional integrated scenarios, socio-economic policy and adaptation options are investigated.

Examples for this approach are published in the study “Climate Change in Germany Vulnerability and Adaptation of Climate Sensitive Sectors”⁹, which was commissioned by the Federal Environment Agency, the GLOWA-Elbe project (“Impacts of Global Change on the Water Cycle in the Elbe Region - Risks and Options”¹⁰) funded by the Federal Ministry of Education and Research, or in the RIVERTWIN Project (Regional Model for Integrated Water Management in Twinned River Basins ¹¹) funded by the EU Commission.

The Netherlands

In the Netherlands, the focus of climate change adaptation is on mainstreaming and 'no-regret' strategies. No adaptation measures are taken for the sake of adaptation only. In the water sector, climate change adaptation measures are strongly integrated into the policy agenda. Here, emphasis is placed on 'no-regret' strategies. Through water management agreements, it has also been integrated into other policy areas. For example, the spatial implications of the Dutch Cabinet's position on water management and the associated adaptation measures have been incorporated into the Dutch Spatial Policy. Inclusion in the policy for rural areas offers an opportunity to combine the implementation of measures for increased safety and flood prevention in rural areas with other measures. These have objectives such as improving water quality, combating dropping water tables, reconstructing rural areas and improving the ecological infrastructure.

The development of socio-economic scenarios for climate change assessments has recently been begun as part of the large climate research programme Climate changes Spatial Planning (CcSP). The project builds on the work done under the WLO study.¹² The WLO study prepared long

⁷ www.anpassung.net

⁸ www.umweltbundesamt.de; <http://www.umweltbundesamt.de/klimaschutz-e/index.htm>

⁹ <http://www.umweltdaten.de/publikationen/fpdf-l/2974.pdf>

¹⁰ <http://www.glowa-elbe.de/german/index-en.htm>

¹¹ <http://www.rivertwin.org/>

¹² http://www.welvaartenleefomgeving.nl/context_UK.html

term socio-economic scenarios for the Netherlands Government the scenarios assess the current policy in the natural and build environment given the possible future international economic and demographic development in the Netherlands. The project under the Climate changes Spatial Planning programme will generate socio-economic scenarios for climate impacts and adaptation research and policy in The Netherlands. The scenarios and scenario resources (storylines, parameter values, numerical and simulation models and process guidance) will be designed, with particular focus on spatial planning issues related to climatic change. More detailed information on the Climate changes Spatial Planning programme and the ongoing research can be found on the English website;¹³

Another example of the use of socio economic scenarios is part of the national adaptation programme in the Netherlands (ARK). Under the ARK programme a project (the Route Planner) started that works on the development of the national adaptation strategy and agenda. This first quick assessment was partially based on the long-term scenarios provided by the WLO study the study assesses the long-term effects of current policy, given the possible future international economic and demographic development of the Netherlands. The English summary of the routeplanner report is available for downloading on the website;¹⁴

The background report for the routeplanner report ‘A qualitative assessment of climate adaptation options and some estimates of adaptation costs’ is also available on the website;¹⁵ The report explores adaptation options in response to impacts of climate change in the Netherlands and assesses the qualitative and quantitative characteristics of adaptation options and provides a system to rank these options.¹⁶

Spain

The general framework in Spain for all the activities related with impacts, vulnerability and adaptation to climate change is the “National Plan for the Adaptation to Climate Change” (PNACC), approved and adopted last year. In this framework, socioeconomic information is considered an essential aspect for the vulnerability assessments. The promotion of wide participatory processes in the climate change impacts and vulnerability assessment is a key aspect considered in the PNACC, and it is a way that contributes to improve the availability, exchange and integration of socioeconomic information.

Among the first activities launched in the framework of the PNACC, an assess of climate change impacts on water resources is developing at present. Water resources is a high priority sector in Spain and it drives the planning and management of many other key sectors. The project, together with the quantitative and qualitative assessment of the impacts of climate change on water resources, includes the effects of climate change on different types of demands: irrigation demands, industrial demands and water supply demands. Socio-economics projections in these three classes of demands are being developing.

¹³ <http://www.klimaatvoorruijnte.nl/pro3/general/start.asp?i=0&j=0&k=0&p=0>

¹⁴ http://www.programmaark.nl/Activiteiten/Versnellingsdagen+2006/dochome/Downloads_GetFileM.aspx?id=17491

¹⁵ http://www.programmaark.nl/Activiteiten/Versnellingsdagen+2006/dochome/Downloads_GetFileM.aspx?id=17858

¹⁶ http://www.programmaark.nl/Internationaal/Downloads_GetFileM.aspx?id=19401 (Additional information on the ARK programme)

Sweden

In Sweden there is no climate change adaptation strategy in place yet. However there was a government inquiry in 2005 that resulted in the “Commission on climate and vulnerability”, in which many actors on different levels of society take part. The primary aim of this work is to analyse the vulnerability in society related to extreme weather situations and climate change effects. The commission will deliver their report by the 1st of October 2007.

Research

Mistra (the Swedish Foundation for Strategic Environmental Research) has decided to invest in a new programme, the Swedish Research Programme on Climate, Impacts and Adaptation. The program seeks to create a new joint framework and model system for studies and feedback on, and between, the climate system and society. The whole chain, from socioeconomic development to land use and back to climatic effects, will be included.

Climatools is a research programme dedicated to developing a set of tools that will make it easier for social planners and decision makers to adapt our society to the consequences of climate change. One project is aimed at developing scenarios that describe the possible effects of climate changes on society at municipal and regional levels. The scenarios serve as an aid for analyzing the need for adaptation measures. They also serve as a basis for ethical valuation of various action proposals. Another project is focusing on geopolitics and climate change investigating the large-scale consequences of international policies in general and of security policy consequences in particular, as well as the consequences of climate change. Will we see new conflicts arising related to resources and land and, if so, where? Alternatively, will there be an emergence of international cooperation? One project is working on developing checklists, methods and computer tools that may be useful for decision makers at local level (mainly municipalities) for adapting their activities to future climate changes. There is also a project on gender, climate change and adaptation. In this project, the gender aspects of adaptation to climate change will be studied and various approaches that will ensure that the interests of women and men are treated equally when designing various measures in climate change adaptation will be proposed.

United Kingdom

Cross-Regional Research Programme ¹⁷

In 2006 Defra published the results of a seven-study cross-regional research programme on impacts of, and adaptation to climate change in the UK. Socio-economic analysis featured in two of the studies as follows:

- **Climate Change and the Visitor Economy in England’s Northwest:** This study sought to improve understanding of how socio-economic drivers affect visitor demand to tourist locations under a changing climate. The test hypothesis was that climate change with the onset of longer, drier, hotter summers, would bring Mediterranean conditions to the UK and automatically boost tourism as a direct consequence. Regional socio-economic scenarios were developed and matched with UKCIP climate scenarios. Storylines were developed for each linked scenario, through work with relevant regional actors such as the sub-regional tourist boards. The study found that the influence of the

¹⁷ <http://www.ukcip.org.uk/resources/tools/socio.asp>

climate on tourism behaviour is likely to be overshadowed by socio-economic trends (such as an increase in disposable income and an ageing population). It was found that factors such as heritage, culture, the natural environment, and location of family and friends were more significant determinants of visitor behaviour than weather. Therefore, it cannot be automatically assumed that climate change will bring a boost to UK tourism.

- **Climate Change Impacts and Adaptation: Water.** This project aimed to provide practical guidance for future water resources management by considering future socio-economic and climate change in order to develop “water futures” for 2 UK locations that included estimates of the demand for water from different sectors, the availability of water from different types of sources and impacts on the environment. The project used the UKCIP socio-economic scenarios and paired them with corresponding climate change scenarios. Analysis was then done on each scenario to predict water demand and supply under each. The results suggested that given the changes in water supply and demand expected through analysis of these joint climate change and socio-economic scenarios, current water resources planning practices do not adequately address these projected changes. This is especially pertinent for future “hot spots”; areas with high development pressures. The report recommends consideration of both climate change and socio-economic projections in water resource planning.

Flooding¹⁸

A joint report by UK Defra and the Environment Agency showed that it is inappropriate to separate out the social aspects of floods from the technical aspects of flooding. Flood risk management requires multiple approaches and disciplines and these studies provide a wealth of information and data from the social sciences, offering alternative ways of constructing and framing flood risk management. The results show that there is no rationale for separating out the ‘social’ and ‘technical’ aspects of flood risk. Flood risk management requires multiple approaches and disciplines and this research provides a wealth of information and data from the social sciences, offering alternative ways of constructing and framing flood risk management.

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<http://publications.environment-agency.gov.uk/pdf/SCHO1005BJTE-e-e.pdf>

PAPER NO. 6: UZBEKISTAN

**View of the Republic of Uzbekistan
on matters relating to the availability of information
on the socio-economic aspects of climate change and
improving the integration of socio-economic information into
impact and vulnerability assessments**

Republic of Uzbekistan supports the activities of the UNFCCC Secretariat on the Nairobi work program aimed to of socio-economic aspects of climate change.

The development of socio-economic scenarios for the Republic of Uzbekistan was made in the framework of SNC preparation in accordance with «Developing Socio-economic Scenarios for use in Vulnerability and Adaptation Assessment»(NCSP/ New-York, 2004) manual. The expert assessments were also used in these studies.

Actually, using the regional SRES tendencies were prepared the demographic scenarios. Regarding another moving factors only expert assessments were available. For the moment, the national development plans cover the time period up to 2011.

For the improved understanding of adaptation capacity the relevant options of the GDP growth development and their contributions to the main sectors of economy has considerate jointly with the expert assessments of the National Socio-Economic Studies Centre. The work with the insurance companies on the collection of information on the damages related to the dangerous weather conditions is being conducted. The information about the damage caused to the agriculture by frosts and shower precipitation is available. However, the information on economical losses related to the mudflows, avalanches, floods and drought events is absent or inaccessible.

For the comprehensive assessment of impact and vulnerability the generalized recommendations on the evaluation of damage caused by dangerous weather phenomena are needed for the comparison and checking of the risk assessment evaluated by the national experts.

We think that methodological and technical assistance on the development of economical models for the countries with the economy in transition is needed in the framework of the Nairobi work program.

As the level of knowledge and work experience of the national experts in these fields are insufficient, the conduction of trainings at the regional and national levels for the developing countries and the countries with the economy in transition on the assessment of risks of the climate change impact regarding socio-economic aspects and their management would be useful.
