CLIMATE CHANGE AND DEVELOPMENT

CONSULTATION ON KEY RESEARCHABLE ISSUES

SECTION 4: SOUTH ASIA REGION
SECTION 4.3. DELHI WORKSHOP REPORT
TERI

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May 2005

In-country consultative workshop report

Prepared for
DFID, UK

Project Report No. 2004GW35

www.teriin.org

The Energy and Resources Institute

T E R I Report No. 2004GW35

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Workshop report

This workshop report is a compilation of presentations and discussions carried out in the In-country consultative workshop organised as part of the DFID India country study on "Climate Change and Development".

Speakers and participants from varying backgrounds both from the climate and non-climate community were invited to present their concerns on relating issues and identify consequent impacts on dealing with poverty and sustainable development issues.

In all about thirty speakers and participants including those from the organising side - DFID, IIED and TERI had taken part alongwith others in the overall discussions during the course of the workshop. Given below is a session-wise summarisation on discussions that followed suit after each presentation.

First session

The session began with Ms Preety Bhandari welcoming all participants to the workshop. She mentioned that the workshop was part of a study on "Climate Change and Development" being supported by DFID, carried out alongwith the International Institute for Environment and Development (IIED) with the main aim to address climatic concerns as well as identify the linkages to developmental aspects. She highlighted that India's initial national communications has also made an attempt to address one of the sectors in the report focusing on programmes on sustainable development.

She mentioned that the national communications report clearly states that there are reasons to be concerned about the impacts of climate change quoting agricultural, forestry and fisheries as climate sensitive sectors on which most of India's population is dependent. Not to mention that other areas including coastal areas and sectors such as habitats, health, and energy demand and infrastructure are also likely to be affected. The first national communications report recognises further that the achievement of vital national development goals would be adversely effected by climate change. She added that given these concerns highlighted in the first communications report to the UNFCCC, a major thrust on issues relating to vulnerability and adaptation and sustainable development concerns, is therefore foreseen in the second national communications.

Mr Paul Spray mentioned that climate change has been identified as one of the major issues in the process of setting up Department for International Development's (DFID) strategy. This includes the need to focus and understand the impacts of climate change on the poor and their response mechanisms. He mentioned that one of the important purpose for DFID is to try and see where can it focus its resources in research on climate change, besides identifying areas where it can contribute in addition to the existing National and International efforts in order to prevent and minimise the impacts of climate change.

Ms Tracy Tasker mentioned that she would be interested in listening to the deliberations during the workshop; in learning more on what country priorities are being discussed in terms of climate change research, the gaps associated and areas identified for further research with the aim to reduce poverty.

Dr. Saleemul Huq began by giving a brief overview on the scope of the study being carried out by IIED and TERI. He mentioned that this scoping exercise focuses on issues relating to climate change and development with emphasis being on impacts on the poor. He mentioned that amongst the many issues discussed on climate, this study restricts itself and focuses on research relating to the impacts, vulnerability and adaptation to climate change.

He added that the study is a fairly short exercise being done by a small team of people within few months time frame. It includes a global scoping exercise of the literature that exists on climate change and development that besides looking at literature on climate change also seeks to look at more mainstream development literature which may not have climate change as a specific element to it. This will aim to look at information and literature that exists both within the climate change domain and the in context of the larger developmental domain with climate relevant arena. This may include issues on floods and droughts, and other impacts where there is wealth of knowledge and experience and information available.

One aspect that needs attention is the very little documented literature that is available in most developing countries therefore making this exercise all the more challenging. Such regional information thus compiled could inform and help in informing global assessments eg., in the IPCC process. This study shall therefore also aim to gather wealth of information which has not been documented so far. This is because a lot of the climate change specific work is very recent vintage with several projects and programmes being initiated and

implemented in different parts of the world. Not much of this information has been produced or published.

To be able to get more in-depth information from specific regions given the time and resources available three regions and three countries were chosen under the study, in particular for in-depth review. This included, focusing on South Asia and within it India, East Africa and Kenya, and West Africa and Senegal.

A similar scoping exercise as the global study had been carried out in all of these regions and countries mentioned above with the help of regional partners. Besides the literature review, country and regional studies also followed a consultative approach in soliciting the views of various experts from within the countries and the region as a whole, both from the climate and the development community, to prioritise issues and reflect on the impacts on the poor. The interest in holding the workshop as part of the study is to learn from experts from varying background areas that need particular attention in this regard. The idea being not to prioritise issues but provide a broad spectrum of issues defined by various experts from different regions.

Second session

The session started with a background presentation on the DFID study by Ms. Ulka Kelkar from TERI on the in-country consultative analysis on "climate change and development." The presentation focused on the linkages between climate change impacts and adaptation, and policies to attain broader development goals in the country. This was discussed both conceptually as well as for specific priority sectors by juxtaposing the potential impacts of climate change against the Tenth Five-Year Plan targets and Millennium Development Goals. Also, a brief review of climate change research in India indicates that most studies take a scenario-based modelling approach to examine the impact of a single stress, viz. climate change, resulting in limited understanding of differential vulnerability to climate change. More recently, however, studies are beginning to look at approaches like vulnerability indexing, community participation, and multiple stress analysis.

Dr. K.Narayanan, IIT Bombay made a distinction between structural adaptation options that address the supply side, and non-structural adaptation options that influence the demand side. He mentioned that while climate change may influence the biophysical vulnerability of communities, ongoing economic reforms will influence other aspects of vulnerability. He

highlighted a need to correlate population, housing and infrastructure with climate change. According to him for this type of study a broad set of indicators are needed to be considered, a missing-link between the vulnerability to climate change and poverty has to be build and rechecking of existing data and the relation of climate change with its ecological and socio-economic impacts need to be studied deeply. He lay emphasis on reviewing conceptual approaches and available methodologies to measure vulnerability at macro as well as at micro level. At the end he also talked about some social protection mechanism like insurance schemes, risk mitigation schemes, participatory rural appraisal etc.

Prof. Santosh Kumar form the National Institute of Disaster Management highlighted the existence of huge gap between the available literature on climate change and the implications for natural disasters or extreme events. According to him a study on past and likely future global disaster trends is needed to develop robust plans. He also brought up the fact that these disasters not only leads to physical illness but also affects the mental health of people. He suggested the development of a gender-differentiated database on impacts so that appropriate interventions can be designed. All departments responsible for responding to disasters should also be sensitized and involved in risk mitigation, for instance, the health and energy ministries. Finally, traditional coping options, such as those observed in Andaman and Nicobar islands during the tsunami, should be studied for insights to develop adaptation strategies.

Mr Kalipada Chatterjee, Development Alternatives, expressed the opinion that an top-down scientific impact study must have a follow-up phase of research linking the results to people's lives. Speaking of climate change from a threat perspective, he said that an in-depth impact study is needed in sectors to which the poor are closely linked (like energy, health, biodiversity), to guide development policymaking. But climate change also offers the opportunity to link research with various technological aspects as represented by energy efficiency improvement, clean development mechanism, etc. We need to explore how human resource development and technology transfer can make the development process more efficient and sustainable.

Dr Virinder Sharma, DFID focussed primarily on mitigation techniques and development of Climate risk management programme. He mentioned adoption of a holistic approach towards climate change which starts at a country level and goes to local levels. He also raised the issue of mainstreaming current climate variability in development with non-formal arrangements that address the most vulnerable groups (landless, women, children, tribals, etc). Giving the example of

integrating forestry and watershed management issues, he said that mainstreaming need not involve high costs but requires change in institutions..

During the open discussion Mr. S.K.Joshi , Ministry of Environment and Forests said that it's a big challenge to integrate climate change and development. Mr. Santosh Kumar emphasised the term "Capacity Enhancement" instead of Capacity Building. Dr Ligia Noronha, IDRC said that adaptation strategies should be built on the understanding that current risks and vulnerability are part of future risks and vulnerability. While recognising the limits to traditional coping measures, the historical memory of traditional societies could guide the development of large social insurance systems. Changing institutions and mindsets requires sensitizing those charged with rural implementation, providing them the required tools, and establishing a network of researchers, policymakers, and implementers. Mr S K Pande also reiterated that to influence political decision making, it is the responsibility of researchers to make the best decision making tools available to planner and grassroots workers. Mr Sodhi, UNDP SGP pointed out the challenge of involving numerous small and diverse stakeholders.

At the end of the session the following conclusions were made on,

- The importance of micro scale research and institutional policies
- The need to learn from existing traditional practices and building a network with rural areas and communities
- Analysing grass root vulnerability
- Involvement of stakeholders from all possible streams to effectively address relating issues on climate, development and links to poverty

Third session

Session III started with Prof. A. K. Gosain from IIT Delhi giving a presentation on the Impacts of climate change on the water sector. Change in water availability from the present to the future was estimated in terms of actual values in mm for major basins in India. He highlighted that detailed information can be made available when scales of assessment are narrowed down for instance in the case of river Kaveri, assessment at the sub-basin scale highlights that there is wide variation in the amount of rainfall being received in each of its sub basins. Similarly examples of river Krishna and Mahanadi were cited in context. Information on increasing/ decreasing trends in water availability are reflected from such studies that attaempt to

study the impacts of climate change. He mentioned that studies of this nature are important to be able to inform the decision makers as well as plan the appropriate intervention strategies.

A presentation on the impact of climate change on Indian agriculture was given by Prof. Aggarwal. He explained the core areas where the agricultural institute has been working on climate related aspects including inventorisation, impacts assessment, mitigation and adaptation. He mentioned that the models used have an upper edge as these have been developed in-house and evaluated and validated for their results. Discussions on vulnerability of different sections of the society highlight the poor to be more vulnerable, however the impact is known to vary from poor farmers to rich farmers depending on the agricultural techniques being employed. The poor farmers in general do not show much negative responses as they are already facing so many stresses and additional stress doesn't complicate the situation further. Crop yields start declining only when we talk of good farmers and hi tech farmers. In conditions of climatic extreme however the situation varies. Farmers will obviously suffer more because their capacity to adapt is much smaller.

Therefore there is a strong need to be careful in the context in which the term vulnerability is being used. Also he mentioned the word "poor" is also used in relative terms and it mostly depends on who is using it. From a developed country point of view all of us can be termed as poor irrespective of what backgrounds we belong to.

He laid stress on quantification of vulnerability and certain mitigation measures like agroforestry systems, biofuels and resource conservation strategies. At the end of the session he concluded that a 'proactive' approach is required while keeping in mind that vulnerability is not just one-dimensional. There is a need to concentrate on decisions, and effort has to be made for packaging and communicating the existing literature. Besides, focus on 'no-regrets' adaptation options, which have synergy with sustainable development priorities, should be given.

Dr S K Pande, on behalf of Ms Neeta Hooda, ICFRE, mentioned separation of climate change from other anthropogenic and non-anthropogenic influences as a key challenge for forestry research. However, national parks provide opportunities for benchmarking projects. He was of the view that the single most important impact of climate change will be on the role of forests in the water cycle, and emphasised the importance of integrated watershed development.

In the ensuing discussion, Dr Saleemul Huq cited the discussion at a recent Hadley Centre meeting on defining dangerous climate change, and mentioned limits to migration of species like mangroves as a key impact for the Indian subcontinent. Mr Sean Doolan, DFID, explained the importance of making assumptions explicit in research studies, communicating research in a simple and effective language to decision makers, and deepening stakeholder engagement. Prof Gosain talked of inter-ministerial interaction and programme coordination, which requires a common information base.

Fourth session

Session IV had presentations by Mr Prakash Rao, WWF on the impact of climate change on the Sunderbans, and Ms Suruchi Bhadwal, TERI on the vulnerability of Indian agriculture to climate change in the context of economic globalization.

The WWF study explained the "climate witness" approach to record perceptions and responses of local communities. Mr Rao mentioned that the study aimed to articulate witness stories which can be used by policymakers in development planning, model the adaptation process by developing the community's bottom-up consultative process, and bring out multimedia outputs. Community responses included changes in crop calendar, diversification, rainwater harvesting, and alternative livelihood options. Mr Rao also mentioned that more than 40 institutions work in the Sunderbans area but without any coordination.

The TERI study was based on the premise that climate change does not occur in isolation but in the context of multiple stresses. The study developed a district-level vulnerability profile based on biophysical, socioeconomic, technological, and climate factors. Districts in western Rajasthan, southern Gujarat, Madhya Pradesh, Maharashtra, northern Karnataka, northern Andhra Pradesh, and southern Bihar were found to have the highest vulnerability to climate change in the context of economic globalization. Five case studies were carried out, which offered a valuable complement to the macro profile by revealing insights about the determinants of vulnerability at the individual or community levels, including factors such as ownership of assets, access to services, and infrastructural support.

Mr Chatterjee, DA, pointed out that Indian development planning is a top-down process, whereas the need is for a dialogue with the people so they can choose the kind of development they want, which will make them more resilient.

Mr Siddarthan, NORAD, appreciated the fact that both studies targeted affected communities. His query about scientific validation of the witness programme sparked off discussion about climate change attribution. Ms Noronha was of the view that attribution is not needed and that we should recognise that climate change is only one of multiple stresses acting on ecosystems and human systems. Dr Huq said that attribution of a single event is practically impossible but the accumulation of evidence over time and space makes it possible to say that these events are increasingly due to climate change. Mr K D Singh, formerly with FAO, called for gradual preparation for climate change in view of the precautionary principle.

Fifth session

In Sesion V, Ms Sudha, Indian Institute of Science, Bangalore, presented the study of climate change impacts on forestry that was part of the first National Communication study of India. Using BIOME 3 model for about 1500 grids (50 km X 50 km scale), the study predicts that about 70 per cent of the vegetation in India is likely to find itself less than optimally adapted to its existing location, making it more vulnerable to the adverse climatic conditions as well as to the increased biotic stresses. These impacts on forests will have adverse socio-economic implications for forest-dependent communities and the national economy.

The following research needs and gaps in the Forestry sector were highlighted:

- Need to make the climate data more accessible for model predictions.
- Need for an intensive research in developing models having improved resolutions and having more dimensions for realistic projections.
- The forest management strategy should be streamlined in the context of climate change.

Ms Ligia Noronha, IDRC spoke in the context of the coast as a unique ecosystem which is highly dynamic and subject to multiple stresses. She discussed the climate change risks and adaptation strategies for the coastal sector. The discussions began with the emphasis that the uncertainty and vulnerability of the coastal ecosystems is real and therefore the adaptation and coping mechanisms should be devised and incorporated in the development choices. The following points were highlighted:

- The coastal region being at the interface of ocean and land is one of the most interesting and accessible ecosystems, where nature is found in its pristine form. The property systems in and

around the coastal region are highly diverse and the resources are put to multifunctional uses. The rate of migration to the coastal ecosystems is high and the need to understand the migration scenario and its implications are to be established. Taking into consideration the future implications the so-called 'hard science' is needed to be combined with 'soft science'. This can be done by developing and implementing projects that involve multi-stakeholder perspectives for the holistic improvement. There is also a need to involve the stakeholders in prioritising the concerns and planning.

- The need to further study the interactions between different components that affect the system is also stressed.
- Lastly the idea to survey different ecosystem areas to prepare an inventory of natural resources is required

Research projects should be designed by combining modelling elements with 'softer' social science approaches. A 'nested hierarchies' approach could help us better understand how stresses play out at different scales, and how adaptation takes place. She touched on various issues like the potential for conflict in engaging diverse stakeholders, and the role of information flows in adding to coping capacity. In the context of natural disasters she explained how choices made by people reduce the room to manoeuvre, and pointed out the need to allow for movement of species and systems through zoning, shelter belts, etc. Finally, she reiterated the value of inclusive policy formulation and the establishment of simple yet responsive security systems.

Mr Sean Doolan, DFID, raised as a useful area for policy research the issue of drivers and inertia in systems. In response to audience questions, Ms Noronha emphasised that prioritization of research areas, such as the replication of traditional coping knowledge, should be guided by the communities themselves.

Sixth session

The panel discussion session chaired by Dr Prodipto Ghosh began with Dr Patwrdhan's presentation.

Dr Patwardhan laid emphasis on climate change research, including modalities and capacity building. In context of adaptation he discussed the need to move from conceptual understanding to practicality at all levels, for a clearer understanding of the process. The need to carry out more action-based research following the principle of learning by doing. While discussing research priorities in climate change, he emphasised a need for Next Generation- decision models, for

improved projections. The need for improved regional databases of climate information to generate high order statistics was also brought up. H e pointed towards undertaking long-term interdisciplinary projects involving south-south partnership for better results and holistic improvement.

Dr Subhash Chander focused on Water sector, where he talked about the uncertainties and large variability in water availability, which is further exacerbated by Climate change. He emphasised on the need to use IT and other high-tech technologies and go into an adaptive management mode in partnership with stakeholders. The issue of safety of water sector based infrastructures such as Dams, Bridges etc was also discussed including the need to incorporate the climate change concerns in the development project.

Dr K D Singh emphasised the need to integrate socio-economic components to climate change research. The need to make systematic study of past events, documentation of scenarios, cultural concerns and compilation of traditional coping mechanisms and research was emphasised.

Several other important issues that were discussed during the concluding session include,

- The need to create a viable network of people engaged in climate change research.
- Need for more significant and sustained funding / resources for a strengthened institutional capacity and enhanced viability of projects.
- The need for undertaking climate change research in the sectors where the impacts are less studies example- Health sector.
- A need to have reasonably firm numbers in terms of secular changes so that this information can be used to enhance the implementation of adaptive strategies and improved policy making.
- Need to understand how the notion of differential vulnerability plays and the synergy between present natural disasters such as tsunami and long-term climate change.

Annex 1: Photographs

Photo1: Interactive session on sectoral impacts of climate change

Photo 2: Concluding session on country research priorities

Photo 3: Participants and speakers listening to the discussions on day 1

Photo 4: Get to-gether, reception followed by dinner in the evening

Annex 2: Detailed programme

Consultative Workshop on Climate Change and Development
Venue: Seminar Hall, Ground Floor, TERI, New Delhi
4 April, 2005

Monday 4th April

Time	SESSION
9:30 – 10:00 am	**Registration**
Session I **10:00 – 10:30 am**	**Welcome address** Ms Preety Bhandari, TERI **Introductory remarks** Mr Paul Spray, DFID Ms Tracy Tasker, DFID **Project background** Dr Saleemul Huq, IIED
10:30-11:00 am	***Tea / Coffee break***
Session II **11:00-12:30 pm**	**Consultative analysis on "climate change and development"** *Discussing the In-country scoping exercise on"Climate Change and Development" followed by key discussants taking the lead on the subject discussing areas of concern, associated gaps and the need for further research* **Chair: Dr Saleemul Huq, IIED** **Presentation, Ms Ulka Kelkar, TERI** In-country consultative analysis on "climate change and development" ***Key discussants*** ❑ Dr K Narayanan, Indian Institute of Technology, Bombay ❑ Mr S K Joshi, Ministry of Environment and Forests, Govt. of India ❑ Prof Santosh Kumar, NIDM ❑ Dr Virinder Sharma, DFID ❑ Dr Kalipada Chatterjee, DA **Open floor discussion**
Session III **12:30 – 1:30 pm**	**Interactive session covering studies on impacts of climate change in various sectors** *Presentations on the NATCOM India project and sectoral research on impacts, vulnerability and adaptation to climate change in India, associated gaps and need for further research* **Chair: Prof Subhash Chander, TERI-SAS** Impact of climate change on water resources

	❑ Prof A K Gosain, Indian Institute of Technology Delhi Impact of climate change of agriculture ❑ Prof P K Aggarwal, Indian Agricultural Research Institute Impact of climate change on forestry ❑ Mr S K Pande for Dr Neeta Hooda, ICFRE **Open floor discussion**
1:30 – 2:30 pm	LUNCH
Session IV **2:30 – 3:30 pm**	**Key presentations on all India country studies on Impacts, vulnerability and adaptation** *Sharing experiences from the CIDA and WWF studies on impacts on agriculture and biodiversity* **Chair: Mr S K Pande, TERI** Impacts of climate change on the Sunderbans ❑ Dr Prakash Rao, WWF India Exposure of the agricultural sector in India to multiple stresses ❑ Ms Suruchi Bhadwal, TERI **Open floor discussion**
3:30 – 4:00 pm	*Tea/ Coffee Break*
Session V **4:00 – 5:30 pm**	**Interactive session covering studies on impacts of climate change in various sectors** *Sectoral research on impacts, vulnerability and adaptation to climate change in India, associated gaps and need for further research* **Chair: Dr Saleemul Huq, IIED** Impact on coastal regions in India ❑ Dr Ligia Noronha, IDRC Impact of climate change on forestry in India ❑ Dr P Sudha, Indian Institute of Science Bangalore **Open floor discussion**
Session VI **5:30 – 6:30 pm**	Closing Panel on Research Priorities for India on Impacts, Vulnerability and Adaptation **Chair: Dr Prodipto Ghosh, MoEF** ❑ Dr Anand Patwardhan, TIFAC ❑ Dr K D Singh ❑ Prof Subhash Chander **Open floor discussion**
7:00 pm	Reception and Dinner

Annex 3: List of participants and speakers

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Annex 4: Powerpoint presentations