

Second India Disaster Management Congress

4-6 November 2009, New Delhi

A Concept Note on Thematic Session on

CLIMATE CHANGE

1. Introduction

India exhibits great diversity in climate, topography, flora, fauna and land use and as the seventh largest country in the world, it is distinct in its snow capped mountains of the Himalayas in the north, long sea coast in the south, east and west (surrounded by three Seas), plateaus, forests, desert regions and numerous river systems spread all over the country. However with such topographical miscellany come certain climate induced natural hazards such as floods, droughts, landslides and cyclones that expose India's vulnerability time and again. Not only do these have an environmental fall out but also adverse socio-economic and physical infrastructure impacts.

Various studies conclude that surface temperatures in India show warming with considerable regional variations i.e. 0.5 to 0.6°C during 1901-2005 with 1971-2003 having seen a relatively accelerated warming of 0.22°C/decade. Warming is projected to increase by 2-5°C by 2100s. While no clear trend has emerged for rainfall increase or decrease however it is projected that rainfall intensity will increase and rainy days will decrease by 2100. Having said this however it has been noted that rainfall variability from one extreme to the other i.e. droughts and floods seems to have become a regular occurrence thus adversely affecting agricultural output and in turn the economy. According to Intergovernmental Panel on Climate Change (IPCC), India's Initial National Communication on climate change 2004 (NATCOM) to the United Nations Framework Convention on Climate Change (UNFCCC), and recent projections by different studies in India, anticipated climate change will alter rainfall and temperature patterns, thus posing a range of threats to development in India such as change in agricultural production (implications on food security), reduction in fresh water availability, boundary shifts in forests (affecting dependent communities), adverse impacts on natural ecosystems (e.g. Himalayan mountain ecosystem), sea level rise along coastal zones, changes in disease patterns, increased energy demands and impact on climate sensitive infrastructure.

A major part of India's population of over one billion with decadal growth of 21.34% from 1991-2001 is rural and agriculturally oriented for whom the rivers and groundwater are the source of their prosperity. It is investigated that if the National Population Policy (NPP) is fully implemented, the population of India should be 1,107 million by 2010. However, country's population is expected to reach a level of around 1,390 million by 2025 and 1,700 million by 2050. According to World Bank's development data 2008 put India's population at 1,123.3 million for the year 2007 with an estimated growth rate of 1.4% during 2001-07. In its poverty estimations for the same period it positioned infant mortality rate at 57 per 1000 live births, child malnutrition (children under 5) at 44%, literacy age 15+) at 61% and access to an improved water source at 89% of the total population. Furthermore, in an another report by Department for International Development (DFID) highlighted that in India 300 million

people live in extreme poverty and earn less than US\$1 per day, while 500 million earn less than US\$2 a day. It is these groups according to them who are most adversely affected by the above mentioned climate variability as they rely heavily on climate sensitive sectors (rainfed agriculture, fisheries) for livelihood and sustenance, tend to be geographically located in exposed or marginal areas such as flood plains and are less able to respond due to limited human, institutional and financial capacity.

2. The Context

It is keeping this countrywide context in mind that there has been growing awareness and mobilization over recent years regarding the problem of extreme weather events/ natural disasters that cause widespread damage and disruption in India are droughts, floods, cyclones, storms/storm surges/ coastal flooding, extreme temperature, landslides, and avalanches etc., on the part of many of the actors concerned: scientists, policy makers, NGOs, and states. These hydro meteorological disasters are on the rise and threaten the development gains and poverty alleviations efforts of many developing countries. At the same time, climate change is modifying the hazards triggering these disasters, leading to more severe impacts. These changes should be factored into development practices and especially disaster risk management in order to reduce the rising human, economic and financial losses from extreme weather events and climate variability. Since disasters are human phenomena, we can change our ways to reduce our risks. There is need to bring a paradigm shift in disaster management approach especially under the changing climate.

3. Objectives

The objective of this Thematic Session on “Climate Change” to discuss about the:

- a) Present and future climate change scenarios, knowledge gaps and uncertainties
- b) Hot spots over India;
- c) The possible threats from climate change and its impact on climate-sensitive sectors (agriculture, forests and fisheries) and natural resources (water, biodiversity, mangroves, coastal zones and grass lands) and related processes in the short and long term;
- d) Case studies / success stories relevant in the context so as to discuss lessons learnt and best practices for adaptation and mitigation options;
- e) Various initiatives by the government, other institutions (NGOs etc) and communities themselves in disaster management especially under changing climate.

4. Expected Outcome

The session is expected to bring out a set of recommendations on different aspects discussed in the session. These recommendations will be collated and presented at the panel discussion at the end of the session.

5. Session Plan

Date: 4 November

Duration: 6 hours

Key Note Address 1:

Climate Change and Disasters

Ms. Margareta Wahlstrom

UN Assistant Secretary General on Disaster Reduction, Geneva

Key Note Address 2:

Global Warming: Hoax or Clear and Present Danger?

Prof. J. Shukla,

President, Institute of Global Environment and Society

Professor, Climate Dynamics, George Mason University, USA

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Chairperson: Dr Akhilesh Gupta

Facilitator: Dr R. K. Mall

Scientific Programme

Cluster- J: CLIMATE CHANGE

Date: Wednesday the 4th November, 2009

Venue: Hall-5 (tentative), Vigyan Bhavan, New Delhi

Time Slot	Session details
1200-1300	<p>SESSION – 1</p> <p>Chair: Professor S.K.Dube, former Director, IIT Kharagpur Rapporteurs: Dr K.K. Singh, IMD and Shri J.V.Singh, NCMRWF</p> <p>Key Note talks:</p> <ol style="list-style-type: none">1. GLOBAL WARMING: HOAX OR CLEAR AND PRESENT DANGER? J. SHUKLA, President IGES, USA2. CLIMATE CHANGE AND DISASTERS: Margareta Wahlstorm, UN Assistant Secretary General- Disaster Risk Reduction <p>IT-1: Climate Change and Extreme Weather Events - K. Krishnakumar</p>
LUNCH	
1400-1530	<p>SESSION-2</p> <p>Chair: Dr Ajit Tyagi. DG, IMD Co-Chair: Prof S K Dash, IIT-Delhi Rapporteurs: Dr Ranjit Singh and Dr Preveen Devarajan, NCMRWF</p> <p>IT-2 : Climate Change, Food Security and Adaptation strategies- P.K.Agarwal</p> <p>IT-3 : Climate Change, its impact on water resources and adaptation Strategies - R.D.Singh</p> <p>IT-4: Early Warning System and Disaster communication in changing climate Scenarios- D.R.Sikka</p> <p>CT 1 : Global warming and the Characteristics of Water under changing climatic conditions: A critical review- Sushanta Mahapatra and Sudip Mitra</p> <p>CT 2: CC adaptation to water induced hazards: A study in the flood plains of the Bramaputra river basin in eastern Assam, India- P J Das</p> <p>CT 3: Monitoring of glacier lake using Remote Sensing and GIS in the Balalacha La region, Himachal Himalaya- Rajesh Kumar</p>

1530-1600	TEA
1600-1720	<p><u>SESSION 3</u></p> <p>Chair: Prof V.K.Sharma, IIPA Co-Chair: Dr A.K.Bohra, Head, NCMRWF Rapporteur: Shri B.P. Yadav and Shri S.C. Bhan, IMD</p> <p>IT- 5 : Climate Change and adaptation in South Asia - Ajaya Dixit</p> <p>CT 4: Towards a comprehensive glacial lake outburst flood assessment in the Hindu Kush- Himalayas-a methodological approach- Arun B. Shrestha, M Eriksson, P. Mool and Narendra Khanal</p> <p>CT 5: Impact of Climate Change on Health in Urban area- Seema Tripathi</p> <p>CT-6: Food security in climate induced stressed situations- Wajih A Shiraj</p> <p>CT 7 : Performance of DRR strategies in changing climate: A case study of eastern UP- P Singh</p> <p>CT 8: Empowering Communities to understand climate change- Colin Fernandez</p> <p>CT 9: Climate Change adaptation: Is it all about 'good' development?- Harjeet Singh</p> <p>CT-10: Climate Change: To learn to adapt is the best policy- Vinson Kurian</p>
1720-1830	<p><u>PANEL DISCUSSION</u> Theme "Disaster Risk Reduction in Changing Climate Scenario: Scope, Strategies and Challenges"</p> <p>Chair: Professor J Shukla Panelists: Shri D R Sikka, Dr Ajaya Dixit, Dr R D Singh, Dr Akhilesh Gupta Rapporteur: Dr R K Mall</p>

Notes

- Invited talks (ITs) will be of 20 min. duration (18 min for presentation +2 min for Q&A) whereas Contributory talks (CTs) will be of 10 min. duration (8 min for presentation and 2 min for Q&A).
- A Panel discussion will be held towards the end to facilitate detailed discussion on all aspects of climate change including those which have not been presented in sessions.
- Poster display/presentations will be done during tea/lunch time
- Each session will have two Co-Chairs and a Rapporteur
- Each Session must bring out 3-4 recommendations
- Rapporteurs of each session would collate and prepare a unified list of recommendations and submit to the Chairman-Thematic Session
- Panel discussion would debate on various issues and adopt a set of recommendations
- The recommendations from the Panel discussion would be submitted to IDMC-II Secretariat for discussion in the concluding session of the Congress.

Brief Outline of the Talks / Presentations

1. Global Warming: Hoax or Clear and Present Danger? By: J. Shukla, USA

The planet is getting warmer, the sea level is rising, and the concentration of greenhouse gases in the atmosphere is increasing at an unprecedented rate. Yet, there continues to be skepticism, and in some sections of society outright hostility, towards the concept of global warming and its human origins. This lecture will show comprehensive evidence from observations and models that global warming is real and will explain the scientific basis for the validity of the proposition that global warming is a clear and present danger. The facts concerning the observed and projected trends that implicate human activity and that no natural causes can possibly be responsible for the unprecedented changes will be explained. This lecture will describe the projected climate changes in the twenty-first century for the globe and for the Asian monsoon. This lecture will conclude with suggestions for adaptation and mitigation strategies, and possible roles of individuals, institutions and governments in responding to the consequences of projected climate change.

2. Climate Change and Extreme Weather Events – By: K. Krishna kumar, IITM, Pune

This presentation deals with the recent projections of climate change over India especially extreme weather events. India is vulnerable to extreme weather events (drought, flood, Cyclone, Heat & Cold wave etc.). Over the decade of the 1990s, both the number and severity of such events increased. One of the anticipated effects of climate change is the possible increase in both frequency and intensity of extreme weather events leads to hydro-meteorological disasters. There are aggregate trends in India about the impact of weather and climate events.

3. Climate Change, Food Security and Adaptation strategies- By: P. K. Agarwal, IARI, New Delhi

Global climatic changes and increasing climatic variability are likely to exert pressure on agricultural systems and may constrain attainment of future food production targets. Available adaptation strategies can help reduce negative impacts in short-term but to a limited extent. We, therefore, need to urgently take steps to increase our adaptive capacity. This would require increased adaptation research, capacity building, development activities, and changes in policies.

4. Early Warning System and Disaster communication in changing climate Scenarios- By: D. R. Sikka, New Delhi (Ex-Director, IITM-Pune)

Natural disasters frequency and intensity is likely to increase under the climate change scenario and it is time that the authorities responsible for environmental monitoring, preparation of early warnings, communicating the warnings and taking action upon, them work together in synergy such that the loss of life and property, degradation to environment and adverse impacts of development projects are minimized. Hence role of early warning systems and communication

systems can no longer be under-played for disaster reduction in making India more resilient not only in the present but also in the future to the damaging impacts of climate change.

5. Climate Change, its impact on water resources and adaptation Strategies -

By: R. D. Singh, NIH, Roorkee

This presentation deals with the climate change and its impacts on the water resources with a special emphasis on floods and droughts disasters. National Institute of Hydrology (NIH) has initiated a few studies to investigate the impact of climate change on water resources in some of the Himalayan and Peninsular rivers sub-basins. The outcomes of these studies will be briefly presented. Climate change is likely to affect the temporal and spatial variability of the available water. The findings of such studies would be very much useful for evolving the adaptation strategies in order to combat the future challenges in water sector due to climate change particularly in dealing with the disaster management related to water in most effective manner.

6. Climate Change Adaptation in South Asia –

By: Ajay Dixit, ISET, NEPAL

This presentation deals with the climate change adaptation in South Asia. Climate change is no longer a distant concern, but a serious threat to development and poverty eradication. The recent report of IPCC draw attention to the fact that the impacts of climate change will fall disproportionately upon developing countries and poor persons within all countries, thereby exacerbating inequalities in health status and access to adequate food, clean water and other resources. The findings presented in this talk will underline the importance - to scientists and policy makers alike – of understanding the regional and local dimensions of vulnerability, and building long-term adaptive capacity and resilience.

7. Climate Change plans and programmes of India under NAPCC

By: Akhilesh Gupta, DST, New Delhi

This presentation deals with the following questions: (a) What was the rationale behind India's National Action Plan on Climate Change?, (b) How are we planning to implement the National Action Plan on Climate Change?, and (C) How does the government intend to integrate the threats of climate change into the existing National Disaster Management Plan?. The talk also highlights the public awareness is one of the major requirements to deal with climate change issues, both mitigation and adaptation. The 24x7 Weather Channel could greatly help in providing information on weather, climate, climate change, other environmental and man-made hazards, etc. to the people of this country.

8. Food security in climate induced stressed situations-

By: Wajih A Shiraj, GEAG- U.P.

Eastern Gangetic Belt is among the most bountiful regions with plentiful of natural resources but large parts are also poverty- stricken and flood affected. In a region where agriculture on small holding is predominant, floods have caused extreme devastation. With the changes in climatic conditions the nature of floods- rainfall pattern, flash floods, flood timing, water logging

etc.- have also changed causing food and livelihood insecurity. This presentation deals with the how small and marginal farmers of Rohin river basin in eastern Uttar Pradesh have adapted to such stressed situation through locally appropriate agricultural interventions and what efforts will have to be made towards necessary policy support for developing appropriate crop varieties, farming systems and development- disaster management linkages at local level.

9. Global warming and the Characteristics of Water under changing climatic conditions: A critical review-

By: Sushanta Mahapatra (MSSRF-Chennai) and Sudip Mitra (JNU-Delhi)

This paper focuses on the broad area of water management issues such as the major river system of India, condition of ground water resources, the current water utilization, water losses, water under stress, water pollution and increased population & its impact on the problem of scarcity of water. It also focuses on the current water policy, water rights and act, Interstate Water Dispute Act etc. An attempt has been made to illustrate the environmental interface between water and climate. The paper assumed an interdisciplinary approach combining knowledge from environmental sciences with social sciences.

10. CC adaptation to water induced hazards: A study in the flood plains of the Bramaputra river basin in eastern Assam, India

By: P J Das, AARANYAK, Guwahati, Assam

This paper presents the results of a study on the coping and adaptation strategies- both traditional and contemporary that are in practice among the indigenous communities in two remote and socioeconomically under-developed but highly flood prone areas of the Lakhimpur and Dhemaji districts of eastern Assam in the light of the history of the land and the community as well as in the context of the prevailing socio-political and economic scenario. The study was carried out by Aaranyak (Guwahati, Assam) in collaboration with the International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal.

11. Monitoring of glacier lake using Remote Sensing and GIS in the Balalacha La region, Himachal Himalaya-

By: Rajesh Kumar and Pooja Rathore, BIT-Jaipur

This presentation would give an overview about the frequency of the occurrence of GLOF events in the Himalayan region in the second half of the twentieth century and their devastating effect towards the life properties and infrastructures is very well known. A study of glacier lake monitoring is being carried out based on the Satellite imagery and GIS as well as field observation in the Baralacha La region at about 16,500 ft high and their experience shall be presented.

12. Towards a comprehensive glacial lake outburst flood assessment in the Hindu Kush- Himalayas-a methodological approach

By: Arun B. Shrestha, M Eriksson and P Mool, ICIMOD

Climate change has resulted in the retreat of glaciers in the Hindu Kush – Himalayas (HKH). While deglaciation can cause a suite of impacts, one of the most visible and tangible impacts is the formation of glacial lakes. Some of these lakes can burst out causing large flash flood with potentials to cause significant damages to property, lives and livelihoods. The awareness among scientists, decision makers and media on the glacial lake formation and

outburst process has increased in recent years. ICIMOD has developed and advanced a methodological approach for the GLOF risk assessment, which is presented in this paper. Experiences from recent ongoing case studies are also presented.

13. Impact of Climate Change on Health in Urban area
By: Seema Tripathi , GEAG

Gorakhpur Environmental Action Group, with the support of Rockefeller Foundation and ISET has recently studied 20% of the 70 wards of the city for analyzing risks and vulnerabilities. There is significant increase of vector borne diseases and related health problems as well as contamination of ground water. The lower and lower-middle economic group which constitute more than 60 per cent of population are largely depending on public health services. The experiences gained in this study about better city's planning, strengthen health services for better adaptation of vulnerable communities

14. Performance of DRR strategies in changing climate: A case study of Eastern UP
By: P Singh, WINROCK-New Delhi

This presentation will discuss the results of a cost-benefit analysis exercise of all possible DRR strategies under the changing climate. It was revealed that while hard structural solutions (e.g., embankments) to deal with floods will not give very good economic results in the future. At the same time, more decentralized community based soft options will give good economic benefits under various scenarios.

15. Empowering Communities to understand climate change-
By: Colin Fernandes (Indonesia) & and Jerome D'Souza (Dan Church Aid-New Delhi)

The paper attempts to propose a model for community based climate change empowerment and management, combining a theoretical base along with a case study from Indonesia, a country under real threat since the Tsunami in 2004.

16. Coupling climate Change adaptation and Disaster Risk Reduction: Emerging trend in South Asia-
By: Sanjay Srivastava, ISRO and Binod Shakya, SAARC

The recent years have just seen a beginning of this trend indicating the communities of climate change and disaster management talking to each other and coming closer, the integration however continues to be a challenge especially in South Asian region. The present paper intends capturing the images of such trends from semi-arid regions of India and Pakistan; flood-plains of Bangladesh and Nepal; and Coastal regions of India and Sri Lanka.

17. Climate Change adaptation: Is it all about 'good' development?
By: Harjeet Singh, Action Aid International, New Delhi

The paper approaches the concept of adaptation by unravelling the development approach that addresses the underlying factors that cause vulnerability. Adaptation 'solutions' cannot be exported

to a vulnerable area or community but need to be premised on sustainable development approach that empowers vulnerable communities with adequate capacity and resources to build their resilience to adapt to the changing climate.

18. Climate Change: To learn to Adapt is the best Policy

By: Vinson Kurian , The Hindu, Thiruvananthapuram

This presentation will discuss about the disasters in recent years in rural & urban areas are a '*wake-up call*' from technological, social and economic points of view. This brings out the urgent need to address sustainable alternate livelihoods to enhance resilience in changing climate.