



Climate Related Health Adaptation and Resilience In India: Eastern & North-Eastern Region



A Policy Paper Developed under the HER-CAP Project



Resilient India - Disaster Free India

National Institute of Disaster Management

(Ministry of Home Affairs, Government of India)



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Climate Related Health Adaptation and Resilience in India: Eastern & North-Eastern Region : Policy Paper

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FOREWORD

Climate change has dramatic impacts on natural resources, economic activities, food security, health and physical infrastructure. India is one of the countries most strongly affected by climate change. The threat is especially great in areas having high vulnerabilities due to lack of access to healthcare or dependency on natural resources for livelihoods. In such areas it is of utmost importance to identify the regional issues for ensuring protection of human health and lives. Despite containment of infectious diseases, the gains in the healthcare sector are unevenly distributed throughout the country, and there is an evident urban-rural disconnect, especially in the rural and the tribal areas more so of the eastern and northeastern states of India.

In this region, the tough hilly terrain of the northeastern region, sanitation and poverty issues in eastern region is an obvious hindrance to health access and development because of the difficult transportation and communication compounded by problems peculiar to this area such as ethnic violence, pressure on land, economic backwardness, insurgent extortion networks, absence of quality education and porous international border social.

I complement Prof. Anil K. Gupta and the HER-CAP project team for this important contribution. I also thank WHO-India for supporting this endeavor. The efforts of the authors are praiseworthy, as they meticulously brought in the context of this policy paper which covers all these existing and forthcoming problems and their mitigation measures and resilience policy after a close consultation with the experts of Eastern and North Eastern States.

Shri Taj Hassan, IPS

आपदा प्रबंधन महाविचार: पूरा भारत भागीदार

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ABSTRACT

Climate Change is increasingly impacting the natural settings as well as the human lives. Increasing number and severity of the worldwide disasters proves this fact. Along with the other disasters climate change has given significant rise to the Health issues in all types of climates. Few among many more climate driven health issues are increase in Vector Borne diseases, Respiratory diseases, diseases in crops etc. which are becoming the growing concern for the people of villages as well as cities. To understand region wise real scenarios and specific climate induced health problems, Hazard Risk Vulnerability and Capacity Assessment (HRVCA) Workshop for Eastern and North-eastern Regions were conducted. Experts from Climate Change, Disaster Management and Health Background from Various Eminent National Level Institutions and State Government Departments participated and discussed the ground level issues and shared their valuable views regarding the mitigation, adaptation and resilience building to overcome the Climate induced health issues. From the discussion, it is evident that both in Eastern and North-Eastern Region the temperature has increased and the distribution of the rainfall has shrunk within few days to few weeks resulting in water inundation and flood like situations in urban, peri-urban and village areas. This gives rise to vector borne diseases. On the other hand, increasing pollutions are leading to Respiratory and Cardiac diseases. This paper describes subtle way of mitigating such health issues and building resilience towards this, without changing the climatic scenario.

Keywords:

Climate, Regional Health Issues, Mitigation, Adaptation, Resilience Building

1 Introduction

The Climate Change is having lots of direct and indirect negative impact on human being, animals, nature, ecosystem etc. The worst impact of climate change is that it has altered the basic components of climate i.e. temperature, rainfall pattern etc. giving rise to more dry spells and heavy rainfall events within a short period of interval. Also, the geographic distribution of the rainfall and temperature has shown a marked change.

1.1 Context and Background

Climate Change has another deadly impact i.e. the disasters. Due to the rapid climate change the extreme events has increased manifold. The total amount of rainfall has not deviated much but the total rainfall amount which earlier used to take place through three or four months is taking place within a very short period of 5 to 10 days causing severe flood situations, which also gives rise to the crop failures and health hazards. Also, climate change has induced more number of cyclonic storms, landslides and earth quakes. As per United Nations in last 20 years, the economic loss due to climate change related disasters have increased by 2.5 times which drive us to disaster management and think of effective Disaster Risk Reduction (DRR) to achieve minimum loss (Figure 1).

1.2 Impacts of Regional Climate Change on Disaster and Health

Effect of climate change varies in different geographical location. As each and every regional area has its own natural and social coping up mechanism towards the temperature and rainfall change. Therefore, we see a marked difference in the estimated and actual climate change. But even then, one cannot ignore the impact of the global and regional climate change, as some threshold temperature and rainfall situation gives rise to the vector borne diseases. Sudden intense rainfall brings about the higher chances of flash flood and land slide which causes life and property loss especially in the hilly states of Northern and Northeastern Himalayas (For Example Kedarnath flood 2013). On the other hand, States like Kerala which was historically not having any major flood is facing severe flood situations for last two years (Kerala flood 2018, 2019). Rajasthan was known as dry state but now even Rajasthan is also having flood occurrences. Also, the states like MP, UP, Rajasthan Delhi are facing severe heat waves and Orisa, West Bengal and Andhra Pradesh are confronting with severe and several cyclonic storms. Thus, the approach for the regional disaster management strategies has to be problem specific. In this paper, north-eastern and eastern regions of India have been considered.

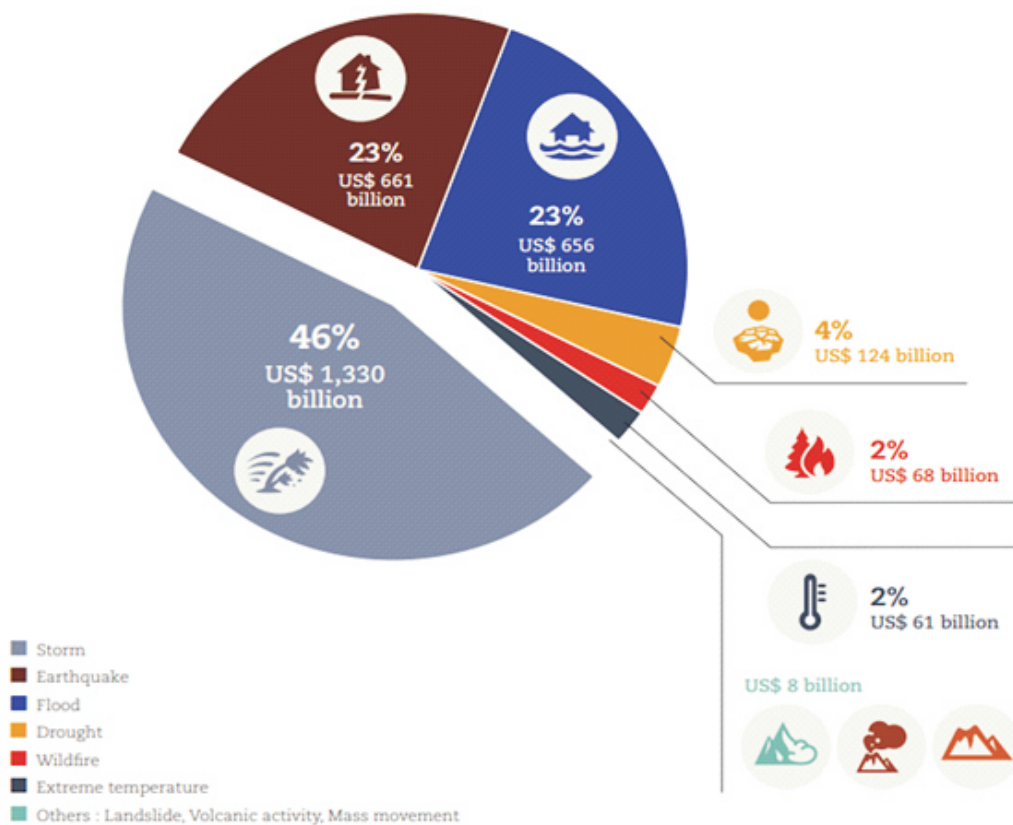


Figure 1 Breakdown of recorded economic losses per disaster type 1998-2007 (in US\$)
(Source- U.N. Office for Disaster Risk Reduction (UNISDR), 2018)

Eleven States, namely Chhattisgarh, Odisha, West Bengal, Assam, Sikkim, Nagaland, Meghalaya, Manipur, Mizoram, Tripura and Arunachal Pradesh participated in the Eastern & North-Eastern regional consultation workshop.

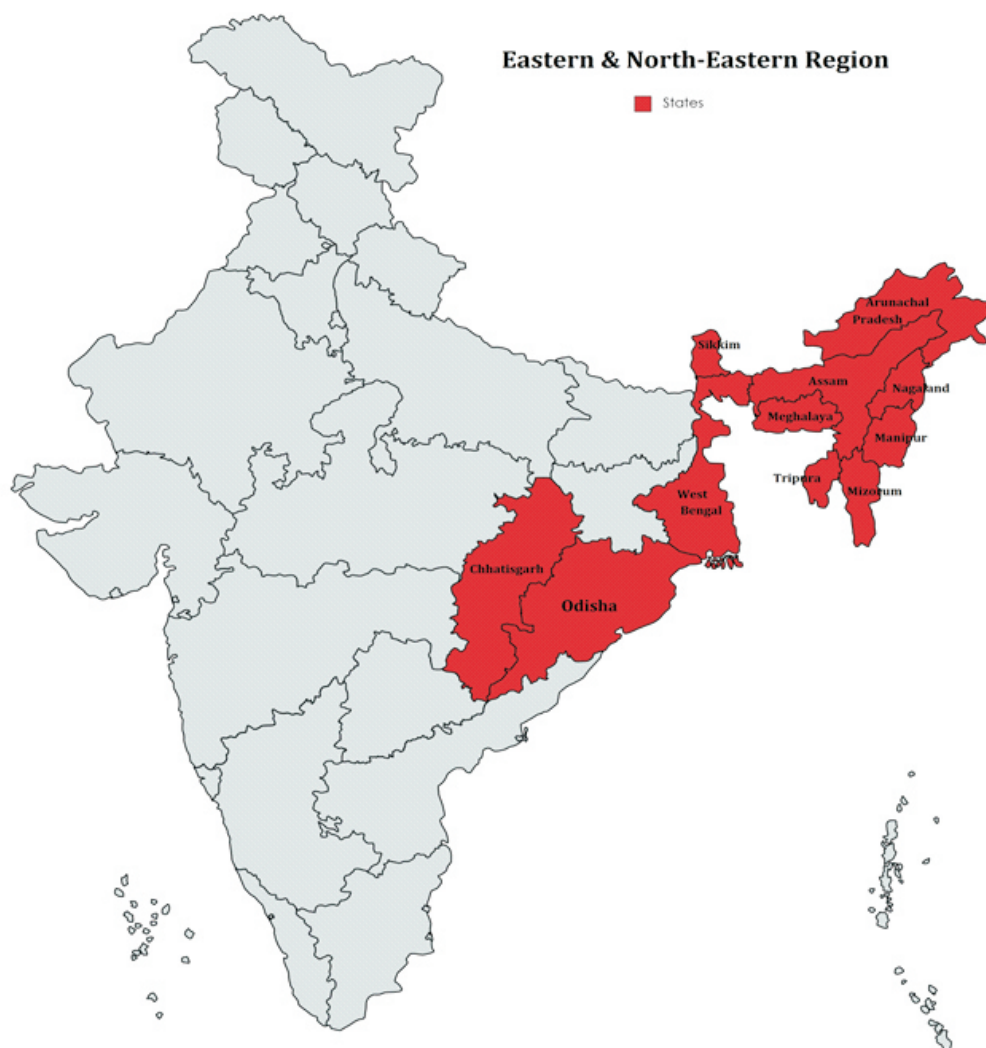


Figure 2 Participatory States in the Eastern and North-Eastern regional consultation workshop (Source: Mapchart 2020)

North East Region

Geographic Profile

The Northeast Region (NER) consists of eight states, namely Arunachal, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. The extent of the NER is from 21.57° N to 29.30° N & 88° E to 97.30° E which consists a total area of 2,62,185 sq. km which is 7.9 percent of the total area of the country. The Brahmaputra-Barak River blankets the entire NER which is divided into three parts, such as a) North Eastern Mountain range, b) South Eastern hill range and c) Assam Plateau, Assam valley & Cachar plains. The 60 percent of NER is forested land and are rich in natural resources comprising one third of the country's total biodiversity, and mineral deposits of dolomite, limestone etc. along with water resources of Brahmaputra and its tributaries which produces 42.54 percent of the total hydro power generated in the country. NER also has a rich production of coal, jute, silk, tea & timber.

The NER consist 40 million populations who reside in 26.2 Million hectares acres of land among which 82 percent belongs to the rural areas with 34 to 91 percent of tribal population. This low-density population of NER is largely dependent on the natural resources as the infrastructure of NER is underdeveloped. Agriculture which is mainly (60%) dependent on south west monsoon provides the basic support for livelihood. Therefore, any climate change can badly affect this entire region.

Climatic Risk Profile

Climate change has overwhelming impact on the Northeastern Region (NER). All over the NER the minimum temperature is increasing, and few districts of Sikkim, Assam, Meghalaya and Arunachal Pradesh are experiencing $\geq 2^{\circ}\text{C}$ per 100 years. The maximum temperature is also increasing over southern Assam. CMIP5 also proves this variability in temperature and rainfall.

Eastern Region

Geographic Profile: Eastern India encompasses Bihar, Odisha, Jharkhand and West Bengal and the Andaman and Nicobar Islands. Four types of land forms are mostly seen in this area i.e., a) Indo-Gangetic plain in which Bihar and West Bengal is situated, b) Chota Nagpur Plateau, where Jharkhand is situated and c) Eastern Ghats and Deccan Plateau, where lies the Odisha, and d) coastal areas of Bay of Bengal. The coastal areas of Odisha and West Bengal comes under this.

The eastern zone is one of the most densely populated area of the country, not only in terms of total population but also in terms of the population density which is

highest in Bihar (1106 person per sq. km) followed by 1028 persons per sq. km in West Bengal. But among the cities Kolkata is most densely populated with 24,000 people per square km which is giving rise to local micro climatic changes and indirectly leading to many of the diseases. The Eastern Region is having a total population of 53.48 Crores residing over 8250 sq. km of area.

Climatic Risk profile: The eastern part of India belongs to the moderate climate zone, having a temperature range of 0° to 45°C. Bengal is having the highest rainfall (250 cm) among Bihar, Orissa, Jharkhand and Andaman Nicobar. But due to the climate change effect the rainfall is not well distributed and is becoming concentrated within a very short period of time which is giving rise to the flood situations. On the other hand, the summer temperatures are increasing. Incidence of lightening is also increasing in Bengal.

Key Health Concerns:

- With the changing climate and increasing global warming seasonality, peak temperature and rainfall periods have changed. Geographical shifts/spread of the micro climates impact human health as with change of temperatures vector borne diseases, symptoms and disease patterns get modified.
- Urban sprawls are most important part of present societal change and extension of cities have blurred boundaries, transforming the peri-urban micro climatic and demographic structures. Increased mobility of people has changed the life styles, leading to increased health issues. Ecosystems, environment, anthropogenic factors and developmental planning has important role to play in increasing health issues.
- Healthcare systems are improving with time but until now the available public health care system is insufficient for the demand and the private healthcare service providers charges extravagantly which is unaffordable for most of the common people, this becomes a big constraint especially during the disaster situation. The coordination among the Health sector and other departments and stakeholders has to be improved and dependence of health sector on other sectors has to be minimized.
- Lack of health consciousness leads people more prone to health disasters. Behavioural change has to be brought towards holistic health awareness and improvements. People are unaware about the safety protocols and dos and don'ts regarding the accidents and injuries, fire, etc. which makes people more vulnerable to these hazards.

- Occupational health and safety is an important matter of concern especially in industries where various health risks including life risk are associated. Providing basic occupational and industrial health safety is important. Alternative medicines could be a good help in this regard.

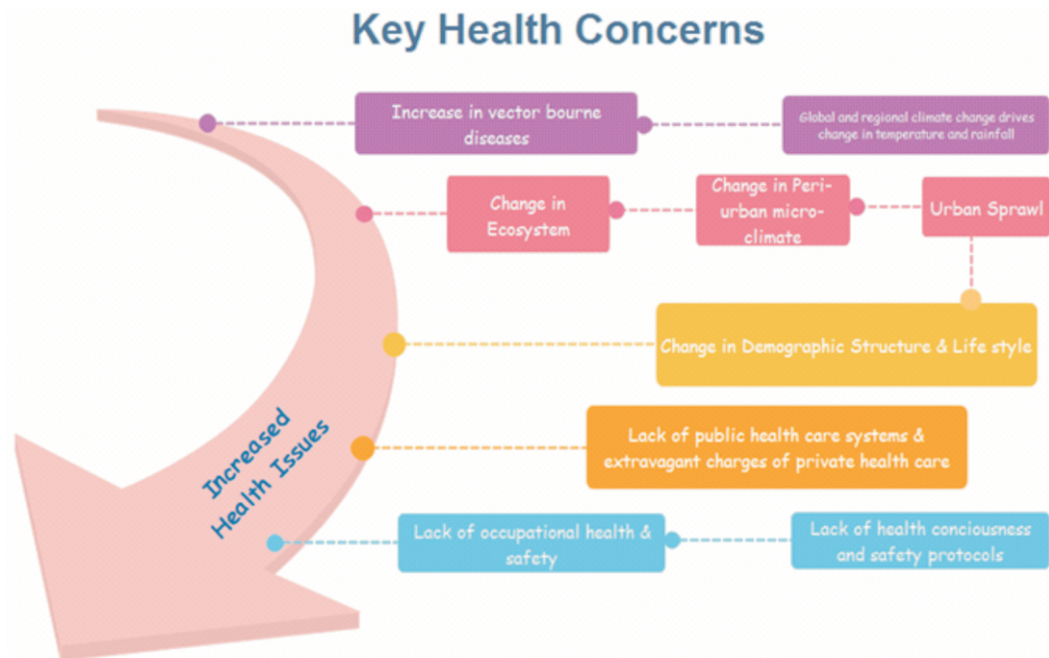


Figure 3: Key health concerns

2 Objective

- To understand the regional impact of climate on health
- To understand the nature and characteristics of regional health issues
- To brought out the probable mitigation and adaptation pathways

2.1 Approach & Methodology

To understand the regional health issues of India five Workshops were organized. One National Workshop “National Programme on Climate Change and Health Sector Resilience” were organized in Delhi. After that four regional workshops were organized. All states of India were divided into four regions such as Northern, Eastern & North Eastern, Southern and Western region and for these regions workshops were organized in Lucknow, Kolkata, Hyderabad and Ahmedabad respectively.

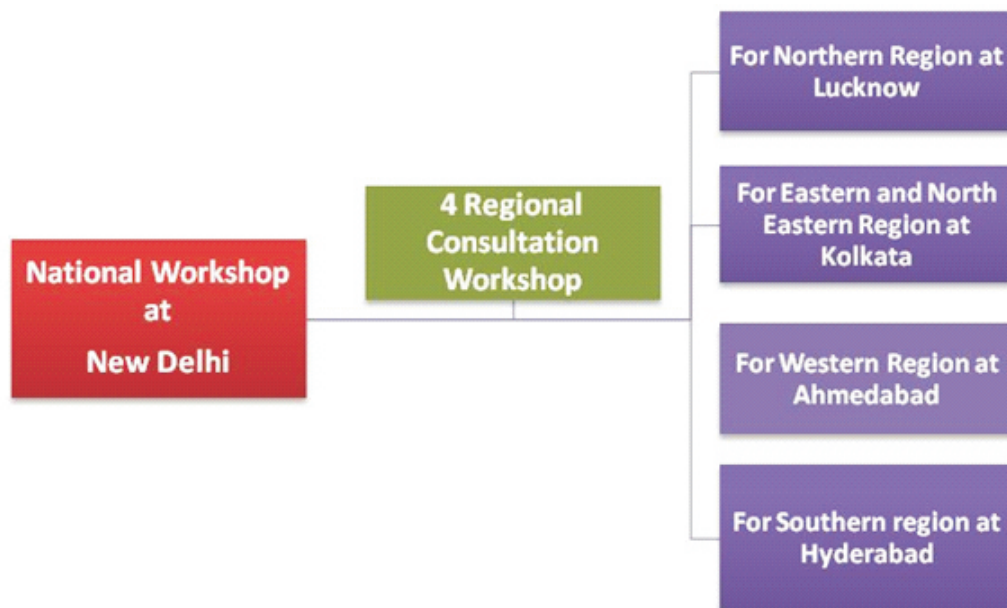


Figure 4: Details of the Consultation workshops organized in national and regional level.

For Eastern and North-Eastern regions of India, Hazard Risk Vulnerability and Capacity Assessment (HRVCA) Workshop was organized on 4th November, 2019 at Kolkata. Twenty six Experts from all North Eastern and Eastern States had joined this workshop to discuss the present health scenarios and challenges in of their respective states in relation to the disasters and changing climate and has given their valuable views on the mitigation process. All the experts were fairly represented from Health, Disaster Management and Climate Change sector.

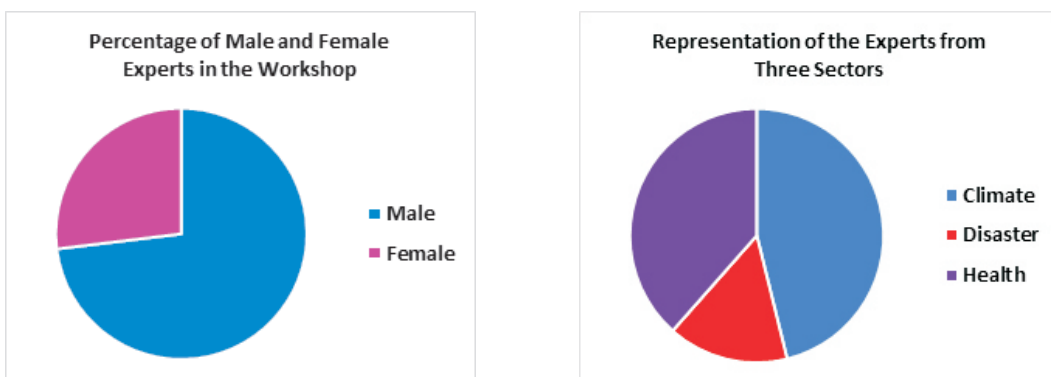


Figure 5: Percentage of Male and female experts in the workshop (Left)
Percentage of experts from Climate, Disaster and Health sector (right)

2.2 Key Participant Institutions

The experts were from several renowned institution and State government authority like Department of Community Medicine VMMC & Safdarjung Hospital, Administrative Training Institutes, Directorate of Health Services, Department of Disaster Management and Civil Defence, Armed Forces Officer Commanding Station Health Organization, Department of Sundarban Affairs, State Disaster Management Authority, Adamas University, Department of Environment, Directorate of Health & Family Welfare Department, Indian Institute of Social Welfare & Business Management, School of Water Resources Engineering, Kolkata Port Trust, Regional Meteorological Centre, National Institute of Cholera and Enteric Diseases : Indian Council of Medical Research, All India Institute of Hygiene and Public Health, World Health Organization, National Centre for Disease Control and many more.

Experts were divided into three groups named Ganges, Hooghly and Damodar. Each group had equal representation of experts from climate, disaster and health sector. The experts were given a framework for the discussion. Experts were given some sample questions to discuss for Hazard, Risk, Vulnerability and Capacity Assessment of the health condition of the various states of Northeastern and Eastern region of India. The discussion included but was not limited to the following issues:

Key Questions

- Spatial and temporal shifts in climatic and weather patterns including events in the Northern states/region
- Changes in disaster patterns and seasonality, spreads
- History of outbreaks and other important cases of health episodes in past 20-30 years, and particularly in past 15 years
- Regional specific emerging health challenges, vulnerability of health systems and health resources, health infrastructure
- Opportunities, possible approaches, programmes, local and regional solutions, to protect health and respond effectively
- How and what type of coordination and interrelations with other sectors and departments is envisaged for health adaptation from climate change and disasters related illnesses
- Any other aspects of importance, including role of ecosystems, agriculture, food, water, energy etc. and relationships with health protection

After the HRVCA activity experts came up with valuable suggestion for building health resilience and adaptation.

Table 1: Health Issues for Adaptation and Disaster Risk Reduction

Problems	Results
Air Pollution	Vehicle: 1. Air pollution levels are increasing 2. 90-95 % commercial vehicles run on diesel. Therefore, this is the major cause of line source of air pollution 3. In some places Pollution might be less but exposure is higher 4. In Orissa, Bhubaneswar is the most polluted city because of transportation traffic 5. Highest number of lung cancer in India is in Kolkata In Kolkata people have Upper Respiratory Disorders inspite of tobacco smoking in Kolkata has gone down 6. To handle the air respiratory diseases adequate Govt. hospitals are not there 7. Life span of the people of Kolkata has been reduced by 6 years and by 10 years in Delhi due to air pollution, heat stress etc.
Pure Drinking Water	1. Natural recharging of water has got affected. 2. Municipal water is being supplied to 80-90% people, still 10-20% population relies on ground water. 3. TDS, chloride content has increased in ground water. 4. Increase in cases of Scrub typhus in Kolkata due to using Pond water
Extreme Natural Events	Numbers and intensities have gone high resulting in higher number of deaths
Increased Cyclone Intensity	Crops and other resources are destroyed
Increased Death Rate due to lightening	More number of cases are registered for the compensation
Delayed Onset of Monsoon	Monsoon is being delayed by 40-45 days. many districts are facing drought situation leading to crop failure
Reliable data scarcity	Problems in proper forecasting
Overall temperature rise giving rise to the vector borne diseases	Vector borne diseases are now infesting the hilly states
Lack of proper infrastructure	1. Hospital sanitization post flood must be done. 2. Govt. Health Care bodies are flooded with patients. Even today there is overcrowding on health facilities. In case of disasters this increases many folds.

Lack of Awareness campaign	1. Easy mechanism of saving life in disaster situation is not known to people. 2. People do not know where to approach during the disasters 3. People are not aware of the govt. schemes and policies
Increasing Population	We are unable to channelize the population resource
Lack of waste management	Pre-and post - disaster waste management can restrain from the water contamination and other vector borne diseases
Lack of trained multipurpose doctors	Specialized doctors are unable to help people in disaster condition
10 times increase in temperature increase rate in WB	Extreme events are increasing
Decrease in rainfall	1. In WB, Odisha and Northeastern states, Number of rain days have decreased. More rain falls in short duration, leading to floods, less recharging of ground water sources, higher runoff and soil erosion. 2. Overall rainfall is likely to decrease in the “rice bowl” districts. 3. December Rain has disappeared from Mizoram
Minimum temperature is getting higher	This is giving rise to the vector borne diseases
Lack of data consciousness among the doctors.	There is lack of reliable data for research and forecast
Arsenic problem in the ground water of Assam, Tripura and foothills of Arunachal Pradesh	Scarcity of potable water
River water pollution	Fishes are getting contaminated with lead, mercury etc. which indirectly harming fish consuming population
Water Table drop	5-10 mm water table drop every year indicates future scarcity of potable water
Ground water contamination	As per NitiAyog per capita water quality has reduced. This Leads to many incurable diseases
River course change due to flood and increased soil erosion	Loss of resources and life
Poor urban drainage system	Current drainage system of Kolkata is for 6mm rain in hour but not we get 30mm /hour. This leads to urban clogging/ flooding
Water pollution	Harms the entire ecosystem
Reverse temperature change livestock productivity	Food industries are getting affected
Appropriate location specific data is not available	Creates problem in assessing the real situation and restrains from making necessary strategies

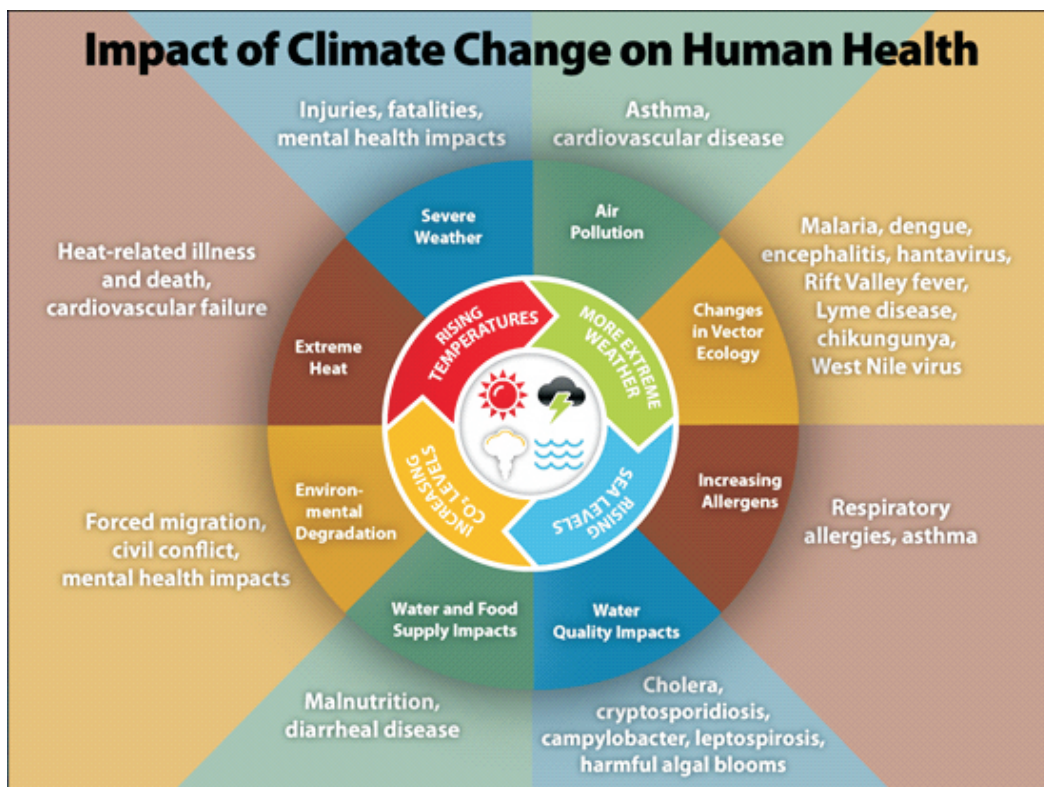


Figure 6: Impact of climate change on human health
(Source - National Centre for Environmental Health, 2019)

3 Health Risk Assessment of North-Eastern Region

The gist of the discussion among the experts brought out some crucial facts such as, Climate Change poses some serious threats especially to the North-Eastern Region. For example, increased temperature and long warm spell can lead to air quality reduction and heat related death in urban areas, as increasing temperature also raises the air borne particulate matter which enhances the asthma, respiratory tract infection and other cardio vascular diseases (National family Health Survey 2005-06). Young children, elderly people and people who are already suffering from respiratory diseases or heart problems are most vulnerable. The climate extremes or disasters have potential to destroy public health infrastructures as well. North East is not well equipped to fight these types of situations. Cherrapunjee, the wettest place on this earth is experiencing an unseen dry spell and rain deficit (Majra and Gur, 2009). These events may pose serious threat to food security and availability and quality of potable water as prolonged dry spells are forcing glaciers to retreat, which are the only source of fresh water of the hilly regions. This may force to compromise health and hygiene and lead to water borne diseases like diarrhea, trachoma (an eye infection that can

lead to blindness) and skin problems (WHO, 2005). Excessive melting of glaciers can also lead to flash floods and glacial lake outbursts. Decreasing rainfall, flood situation and other disasters disrupts the crop production and threaten the food security in these areas and lead to malnutrition especially among the poor people. Malnutrition increases vulnerability towards infectious diseases such as malaria, diarrhea, and respiratory illnesses. Anemia is another important disease, that occurs from mal nutrition especially among the women which results into maternal mortality, weakness, diminished physical and mental capacity, increased morbidity from infectious diseases, peri-natal mortality, premature delivery, low birth weight. Children suffering from anemia might face impaired cognitive performance, motor development, and scholastic achievement (National family Health Survey, 2005-06). There is a direct connection between the temperature change and increase in the vector borne diseases. For example, 2-3°C increase in temperature have a capacity to infect 3-5% more people. Most of the places of the North East comes under the temperate region, where rodents act as store house of various diseases like leptospirosis, tularemia, and viral hemorrhagic diseases, Lyme disease, tick-borne encephalitis, and Hantavirus pulmonary syndrome etc. (Wilson, 2001).





Figure 7: Pictures of the HRVCA workshop conducted at Kolkata for building Health Resilience

4 Strategic Plans to build disaster resilient Health Systems: Prevention, Mitigation & Adaptation Steps

After discussing the problems, all the experts have come up with remediation plans for frequently occurring health issues. The solutions are divided into pre-, during and post-disaster scenarios. Strategies are also categorized as Government policy management or capacity building or resource inventory and infrastructural facility development.

4.1 Pre-Disaster

4.1.1 Government Related Policy Management

- Organizing village level awareness campaign for common people is important to educate them about easy mechanism of saving life in disaster situation, right people to approach during disaster, Govt. schemes and policies. Location and disaster specific skill development for officials (in service periodical skill development), service providers and all the stakeholders are required.
- GRAP: Graded Response Action Plan has to be prepared. Role of NGOs, Disaster management units, Panchayats must be explored to reduce health burden due to Climate Change.
- Impact based forecasting for all types of disasters are needed. There is a need of watershed management as the water quality has reduced.
- Skill developments towards multi treatment for specialized doctors are needed.

- Govt. has to implement strict action towards disposing untreated industry effluent to the river or other water bodies as it is contaminating the ground water table and other water bodies and increasing the fish contamination, which ultimately leads to many fatal diseases in human body.

4.1.2 Infrastructural Facility Development

- Infrastructures have to be disaster resilient. Disaster specific infrastructures have to be built (like for heat stroke we need AC rooms etc.).
- More Govt. health care institutions are needed to be established to meet the disaster emergency, especially in the rural areas. Hospitals have to be proactive to manage the disaster well.
- Urban poverty alleviation must be taken care of. In this regard, urban coordination departments are important stake holders, who should take part.
- Natural recharge of water has to be facilitated to uplift the ground water table.
- Action has to be taken towards constraining the vector borne diseases in hilly states as due to increased warming the vector borne disease has infested these areas.
- Water quality has to be improved for many of the cities as it has gone down considerably and giving rise to the many of incurable diseases and harms the entire ecosystem.
- The capacity of urban drainage has to be improved to reduce the urban water logging or flooding.

4.2 During Disaster

- Multipurpose doctors are needed to manage the disaster induced illnesses and emergency situations.
- Mobile health camps are necessary to reach the victims in interior locations with limited connectivity. Medicines, water and other necessary things have to be distributed in the affected area in an ecosystem friendly way.
- Community participation and local medicine also helps in locked situation.
- Testing kits and facilities for diagnosis of vector borne diseases and other illnesses are to be provided in the remote locations.
- Relief department need to prepare disaster aid boxes like first aid box.
- Relief camps have to be healthy to provide physical treatment and mental support to the sick and traumatized disaster victims. Govt. need to keep separate arrangements for the tribal people who stay away from the civilizations.

- Awareness about Dos and Don'ts, community participation and IEC is inevitable.

4.3 Post disaster recovery

- Post flood hospital sanitization must be done to save local people from endemic diseases.
- While recovering from the disaster situation plastic should be avoided and promotion of biodegradable or recyclable material has to be done.
- Pre-and post-disaster waste management can restrain from the water contamination and other vector borne diseases. Any abandoned material which has been destroyed due to the disaster could be a possible birth place of vector borne disease therefore those aspects should be taken care off.

4.4 Resilience Building

In modern day Disaster Management, resilience building is the most accepted idea to achieve zero fatality and save resources from all types of natural and man-made calamities. Health Resilience building pathways are discussed here.

Government Related Policy Management & Capacity Building

- Making awareness campaign in disaster prone areas is important.
- In service periodical skill development, training and capacity building exercise must be organized for doctors, nurses and other medical professional. Mock drills have to be practiced. Private Health Systems also has to be incorporated in this process.
- Day to day appropriate location specific data need to be acquired. Some data is already available in “Health Management Information System”, “National Health System Resource Centre” and IDSP provides block wise data, but people are not aware. We have to check the correlation between the climate data and health data to understand the real impact of climate change on health.
- Air pollution levels are increasing. We must discuss its link with climate change. Researchers need to link the climate change data and environmental and ecosystem changes.

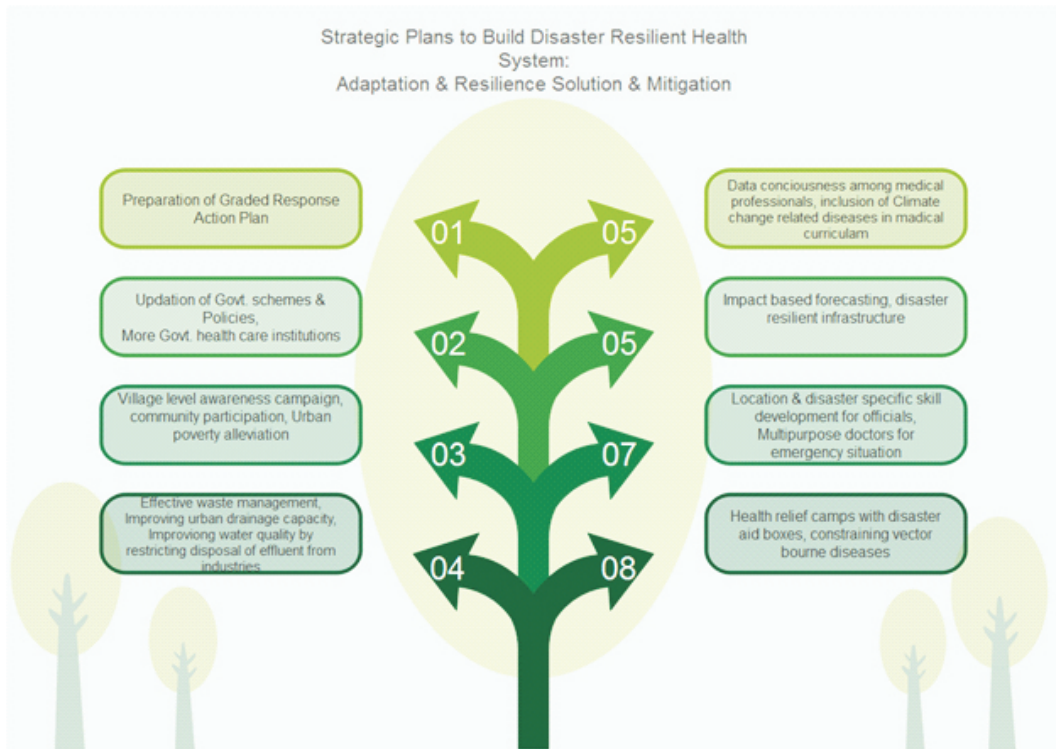


Figure 8: Pathways for adaptation, mitigation and building resilience.

- Officials should identify major threats in various disaster-prone areas and make the plans accordingly. In this regard, coordination of all departments is needed. They should also gather feedback from people suffering from several disasters in those areas.
- Climate Change policy has to be incorporated into all planning of center and state. Integration of National Health Planning & Climate Change planning is also required. Regional level data should be maintained and used for regional level planning. Region specific strategy planning has to be done.

4.5 Infrastructural Facility Development

- Improvement of Health infrastructure even without climate change is an urgent need. National programs have to be strengthened to fulfill this.
- We need to create data consciousness among the doctors and it should be incorporated in the curriculum to develop the psychological or behavioral environment towards maintaining the database. Medical curriculum must include Climate Change and environmental change related diseases. Medical

students should be trained in environmental based diseases like arsenicosis etc. All line departments must be informed about environmental diseases and related issues.

- We need to have dependable fact based honest data, without political interventions. Collection of raw data and identifying the probability of the occurrences of various disasters is a must.
- Health infrastructure building and management have to be done. For this proper coordination of all the departments, support, guidance and collaboration with researchers are needed.
- Multi sectoral approach for food, safety, security & disaster mitigation has to be taken. Good communication system with infrastructural and behavioral change towards willingness to do the work is important and has to be adopted to change the disaster scenario. Common SOPs and also case specific SOPs have to be developed.
- More Govt. hospitals have to be built to address the problem of the upcoming new diseases like respiratory diseases, lung cancer, upper respiratory disorder etc. due to air pollution in metro cities like Delhi, Kolkata, Bhubaneshwar etc.
- Proper channelization of the local population resources has to be done to effectively build resilience.

4.6 Overall Recommendations

- Create Awareness among common people and all the stake holders.
- Fact based Research and policy making and including them in State Disaster Management Plan and National Disaster Management Plan.
- Capacity building for the local people and implementers and rescue forces.
- Region and disaster specific Strategy Planning has to be done.
- Greening of Health Care facilities have to be done.
- Carbon Neutrality has to be followed during post disaster recovery.

5 Lessons from Current Pandemic

Ongoing pandemic of COVID-19 has taught us few important lessons about Health Disaster Management.

- Geometric Growth: Unexpected and unforeseen health emergency might appear anytime, and even could become pandemic in very short period.
- Delayed Response: We may not have physical, mental and infrastructural preparedness to respond to a pandemic situation. Emergency research,

production of medical kits and healthcare infrastructural facilities has to be ready all the time.

- Collateral Impact: Measures taken for containment of pandemic could negatively impact healthcare delivery to non-pandemic patients.
- Economic Impact: Healthcare disaster results in illiquidity, job losses, bearish stock market and creates a negative outlook for many economies and in some cases, sovereign borrowing.
- International Trade and Commerce: Restriction on free movement of goods and people even to the extent of banning of export of Emergency Health Care Equipment.
- Hoarding of Essential Goods: Fear of uncertainty results in “Panic buying” and hoarding which makes it difficult to ensure distribution among the needy people.
- Bio-Hazardous Waste Generation: Sudden spurt in bio-hazardous waste generation in hospitals and medical centers due to treatment and testing of patients suffering from the pandemic.
- Increase in Health & Life Insurance Premium: Possibility of sudden increase in health and life insurance premiums.

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About CECR and Project

CECR

The National Institute of Disaster Management (NIDM) was constituted under an Act of Parliament with a vision to play the role of a premier institute for capacity development in India and the region. Under the Disaster Management Act 2005, NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management.

NIDM has a dedicated division for Environment, Climate and Disaster Risk Management (ECDRM) which has been designated as a Centre of Excellence on Climate Resilience (CECR) under the National Action Plan for Climate Change and Human Health (NAPCCHH). The CECR is implementing six research projects namely Climate Adaptive Planning for Resilience and Sustainable Development in Multi-hazard Environment (CAP-RES) with support of DST-Govt of India, National Agriculture Disaster Management Plan (NADMP) funded by the Ministry of Agriculture & Farmers Welfare, Health Resilience and Capacity Building (HER-CAP) with WHO, Crisis Management Plan for Dealing with Contamination of Water Bodies (CMP-WB) funded by CPCB, Disaster Management Plan for Ministry of Environment, Forest and Climate Change (NEFC-DMP) with the support of MoEFCC and Disaster Management Plan for the Dept. of Chemicals and Petrochemicals (NCPC-DMP) supported by DCPC, MoC&F. It also collaborates with a number of international and national organizations working in the areas of climate change adaptation, resilience, disaster management and disaster risk reduction.

HER-CAP project

NIDM in collaboration with WHO India has implemented the project “Health Adaptation and Resilience: Advancing Strategic Knowledge and Capacities” (HER-CAP). Under this project, the following documents have been drafted.

- ‘National Health Adaptation Plan for disasters related illnesses’ for Ministry of Health and Family Welfare.
- Training Manual on ‘Health Adaptation and Resilience to Climate Risks’.
- A compendium of case studies on ‘Climate Change related Disasters and Health Resilience’.
- Four Policy briefs on Regional Issues and Opportunities for Health System Resilience to Climatic Disasters. (For Northern, East & North-Eastern, Western and Southern Regions of India).

- Along with this, four thematic papers on key areas are as follows:
 - Temperature related disasters: Heat and Cold Wave - Implications for Health Adaptation and Resilience.
 - Water related disasters: Floods and Drought - Implications for Health Adaptation and Resilience.
 - Air Pollution and Public Health Emergencies.
 - Environmental services for health protection in disasters and emergencies.

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About the Institute

National Institute of Disaster Management (NIDM) was constituted under an Act of Parliament with a vision to play the role of a premier institute for capacity development in India and the region. The efforts in this direction that began with the formation of the National Centre for Disaster Management (NCDM) in 1995 gained impetus with its redesignation as the National Institute of Disaster Management (NIDM) for training and capacity development. Under the Disaster Management Act 2005, NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management.

NIDM is proud to have a multi-disciplinary core team of professionals working in various aspects of disaster management. In its endeavour to facilitate training and capacity development, the Institute has state-of-the-art facilities like class rooms, seminar hall and video-conferencing facilities etc. The Institute has a well-stocked library exclusively on the theme of disaster management and mitigation. The Institute provides training in face-to-face, on-line and self-learning mode as well as satellite based training. In-house and off-campus face-to-face training to the officials of the state governments is provided free of charge including modest boarding and lodging facilities.

NIDM provides Capacity Building support to various National and State level agencies in the field of Disaster Management & Disaster Risk Reduction. The Institute's vision is to create a Disaster Resilient India by building the capacity at all levels for disaster prevention and preparedness.



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