



Climate Related Health Adaptation and Resilience In India: Western 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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National Institute of Disaster Management (NIDM)

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Climate Related Health Adaptation and Resilience in India: Western Region : Policy Paper

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FOREWORD

Climate change is the single biggest health threat facing humanity, and health professionals worldwide are already responding to the health harms caused by this unfolding crisis. The Intergovernmental Panel on Climate Change (IPCC) has concluded that to avert catastrophic health impacts and prevent millions of climate change-related deaths, the world must limit temperature rise to 1.5°C. Past emissions have already made a certain level of global temperature rise and other changes to the climate inevitable. Global heating of even 1.5°C is not considered safe, however; every additional tenth of a degree of warming will take a serious toll on people's lives and health.

While no one is safe from these risks, the people whose health is being harmed first and worst by the climate crisis are the people who contribute least to its causes, and who are least able to protect themselves and their families against it - people in low-income and disadvantaged countries and communities.

I complement Prof. Anil K. Gupta and the HER-CAP project team including Dr. Anjali Barwal and Ms. Atisha Sood 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 forth coming problems and their mitigation measures and resilience policy after a close consultation with the experts of Western States & UTs.

Shri Taj Hassan, IPS

आपदा प्रबंधन महाविचार: पूरा भारत भागीदार

Climate Related Health Adaptation and Resilience in India: Western Region

ABSTRACT

Climate change and anthropogenic global warming, when combined with social and other environmental variables, poses a significant health risk. is identified to have a close relationship with the increase in health issues, causing epidemics and introducing new health problems. Robustness of the health care system is an essential determinant in the risk to human health. Therefore, areas with better access to health infrastructure help the population to adapt to health problems arising out of the adverse effects of climate change. Each region is presented by a different and varying degree of climate impacts. The western parts of India, are located in the arid region of India. Due to the geographic location, climatic conditions and other factors, the climatic impact on these regions and human health differs from other parts. However, there are some commonalities, as well. Simultaneously, the adaptive capacity of each region and State is different due to many parameters like the availability of health care infrastructure, education, social structure. Therefore, better health infrastructure and access to health increase the resilience of the State and region to climate-related health impacts.

Keywords: Climate Change, Health Adaptation, mitigation, resilience, Disaster, Health Impacts

1. Introduction

Climate Change has many direct and indirect negative impacts on human beings, animals, nature and the ecosystem. The worst of all these is the effect climate change has had on the basic components of climate like the temperature, rainfall pattern etc. giving rise to more dry spells and heavy rainfall events in short intervals. Also, the geographic distribution of the rainfall and temperature has shown a marked change.

Climate change is identified to have a close relationship with the increase in health issues, causing epidemics and introducing new health problems. Robustness of the health care system is an essential determinant in the risk to human health. Therefore, areas with better access to health infrastructure help the population to adapt to health problems arising out of the adverse effects of climate change. Each region is presented by a different and varying degree of climate impacts. The western parts of India are located in the arid-dry region of India. Due to the geographic location, climatic conditions and other factors, the climatic impact on these regions and human health differs from other parts. However, there are some commonalities, as well. Simultaneously, the adaptive capacity of each region and State is different due to many parameters like the availability of health care infrastructure, education and social structure. Therefore, better health infrastructure and access to health increase the resilience of the State and region to climate-related health impacts.

In view of the above, this policy paper has been drafted to highlight the climate impact on human health, resilience and capacity building existing and further developments needed in the western region of India.

2. National Action Plan for Climate Change & Human Health

This indicates number of steps for India's development and climate change related objectives for adaptation and mitigation. It has introduced 12 national missions on climate change as global climate change is going to affect the morbidity and mortality rates especially in developing country like India. Therefore, pilot testing of new approaches through case studies are undertaken for climate sensitive locations or hotspots to achieve disaster resilience.

2.1 Objectives of National Mission on Climate Change and Human Health

- To create awareness about the impact of climate change on health.
- Capacity building of the health system (including infrastructure, resources etc.) to respond against climate induced diseases.
- Analysis of case studies to reinforce preparedness explore new cope up

mechanism and reduce vulnerability towards climate change related disasters.

- Assist the states to appraise their respective vulnerabilities and help in building capacity for adaptation and mitigation.
- Develop partnerships with all stake holders to create synchrony and synergy with other missions.
- Strengthen monitoring surveillance & research capacity to fill the gap in health practice and policy.

2.2 National Health Adaptation Plan for Disaster related illnesses

The National Health Adaptation Plan (NHAP) for Disaster related illnesses has been prepared by National Institute of Disaster Management, New Delhi, as a Centre of Excellence of Ministry of Health and Family welfare for disaster related issues. The major objectives of NHAP is to create enabling environment, build the capacity of climate resilient healthcare system; help institutions strengthen their preparedness, enhance the health system resilience in terms of universal health coverage; early warning, surveillance and community mobilization in the context of health emergency risk management.

The primary intervention areas to implement HAP are strengthening and expanding health infrastructure, identifying and assessing health hazards and vulnerabilities associated with climate change related disasters, building human resource capacity through policy planning, advocacy, research, training, education and knowledge management, promoting climate resilient water and sanitation facilities, revising building codes of health facilities, promoting community health insurance scheme, advocating and creating awareness on climate change and health as well as encouraging research and development programmes on health and climate change. The NHAP proposes a seven-pronged strategic approach to achieve its goal of developing a climate change resilient health system (Fig 1).

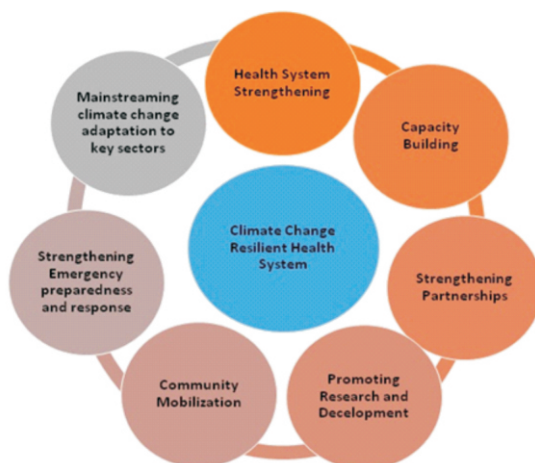


Figure 1: Seven-pronged strategic approaches to develop a climate change resilient health system

3. Demography of the region

States of Gujarat, Rajasthan, Madhya Pradesh, Maharashtra and Goa, and Union Territories of Daman and Diu and Dadra and Nagar Haveli, together form Southern India (Figure 2). Maharashtra is the second most populated state of India with estimated population of 112,374,333 in 2011. Followed by Madhya Pradesh, Rajasthan and Gujarat in the western region with population of 72,626,809, 68,548,437 and 60,439,692 respectively. Goa is the least populated state in the region with the population of 1,458,545. Rajasthan has 75.13% and Madhya Pradesh has 72.37% rural population. Gujarat and Maharashtra have 57.40% and 54.78% rural population. Goa has more urban population rather than rural of 62.17%.

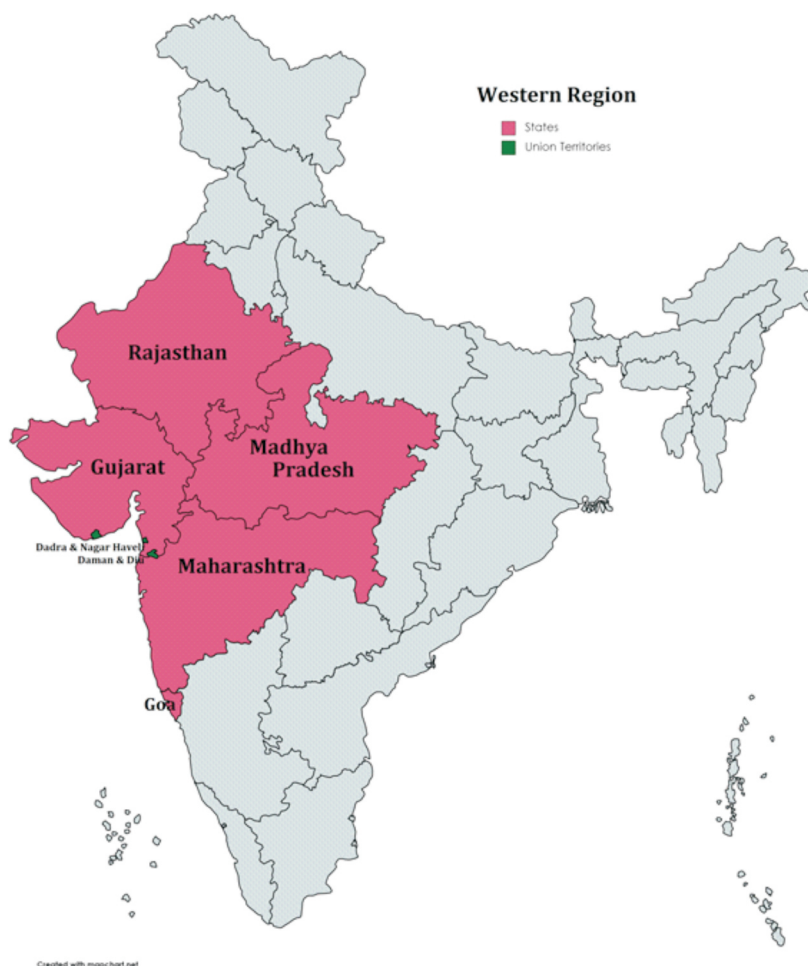


Figure 2: States and Union Territories covered in Western India

4. Disaster Profile

Natural disasters are consequences of a natural hazard like an earthquake, landslide, cyclone, flood, or Tsunami which affects human activities. More than two-thirds of India's coastline is prone to cyclones and Tsunamis. Most of the area in Rajasthan and adjacent area of Gujarat is a hot desert. The South-Eastern area of Gujarat and Western Maharashtra and Madhya Pradesh are prone to cyclones, and floods. The state of Rajasthan has highest occurrences of drought. The adjoining Gujarat Region which mostly belongs to semi-arid climate also experiences high incidences of drought. Cases of droughts have been observed in Maharashtra as well. Western most part of Gujarat State is in seismic zone V, followed by Zone IV in adjacent region as well as a small region in western Maharashtra. Most of the western region is in seismic zone II with some outlining area of all western states in zone III.

5. Climatic Profile

The Western region has a predominantly coastal climate because of the Arabian Sea and the Gulf of Kutch. Many areas the west exhibit high day-time and low night-time temperatures during pre-monsoon season. The range of the daytime maximum and night-time minimum temperatures is found more than 15 °C at some places. Maximum temperatures rise sharply exceeding 45 °C by the end of May and early June resulting in harsh summers in the region. The days and night are hot and humid during the summer season. Monsoon strikes in July and lasts till September. The state of Rajasthan has an arid climate due to Thar Desert in the area. In the states of Gujarat and Rajasthan significant decrease in the mean annual temperature trends are observed unlike the rest of the country showing an increasing trend. From October onwards, the climate becomes cool.

REGIONAL HAZARD & RISK

6. Climate Risk

6.1 Temperature and Rainfall

The temperature along the west coast is expected to rise by 1.7 to 1.8 degree Celsius by 2030, whereas the surface annual air temperature along the east coast may rise by 1.6 to 2.1 degree Celsius. In the north-west of India, near the border with Pakistan, we find a vast arid area, which covers the western part of the states of Rajasthan and Gujarat, to the west of the Aravalli Mountains. This area receives the monsoon rains for a short period, from late June or early July to mid-September, and with moderate rains.

Total annual rainfall is lower than 400 mm (16 in), but it is usually higher than 250 mm (10 in), which is considered as the limit of the desert climate, except in the far west, where we find the Thar desert. However, the rains are concentrated in such a short period of time that the vegetation survival is difficult, except for some shrubs or xerophile plants. Even in the Thar desert, however, here and there we find a bit of vegetation, albeit in a landscape made of sand dunes. In this area, there are cities such as Bikaner, Jaisalmer and Jodhpur. Sometimes there can be sandstorms, especially from March to June. During the heatwave of May 2016, Phalodi recorded India's heat record with 51°C.

In winter, from December to March, temperatures are pleasant, with cool or slightly cold nights, around 10/11°C, and warm days, around 26/29°C. Already in March, the heat becomes intense, with an average maximum of 34°C, which rises to 41.5°C in May. From April to June, before the monsoon, during the hottest days, the temperature can reach as high 47/48°C in the shade. The monsoon lowers a bit the temperature, to 36.5°C in July and 34°C in August; on the other hand, it increases moisture. After the monsoon, the temperature rises slightly in September and October, and then drops again at the end of the year.

6.2 Heat wave

Global temperatures and the frequency and intensity of heatwaves will rise in the 21st century as a result of climate change. High air temperatures can affect human health and lead to additional deaths. Extended periods of high day and nighttime temperatures create cumulative physiological stress on the human body which exacerbates the top causes of death globally, including respiratory and cardiovascular diseases, diabetes mellitus and renal disease. Heatwaves can acutely impact large populations for short periods of time, often trigger public health emergencies, and result in excess mortality, and cascading socioeconomic impacts (e.g. lost work capacity and labor productivity). They can also cause loss of health service delivery capacity, where power-shortages which often accompany heatwaves disrupt health facilities, transport, and water infrastructure.

In India, Heat waves typically occur from March to June, and in some rare cases, even extend till July. On an average, five-six heat wave events occur every year over the northern parts of the country. Single events can last weeks, occur consecutively, and can impact large population. In 2016, severe heat wave conditions affected Bihar, Jharkhand, Gangetic West Bengal, Odisha, Punjab, Haryana, Chandigarh & Delhi, Rajasthan, Maharashtra, West Madhya Pradesh and Gujarat.

7. Disaster Risk

Climate change exacerbates disaster risk. The disasters occurring in western India:

1. Heat wave related health risks and disasters are on the rise.
2. Maharashtra has been ranked at the top of the list of Indian states, vulnerable to natural disasters, followed by West Bengal, Uttar Pradesh, and Madhya Pradesh, according to the National Disaster Risk Index. In the recent past, some states like Gujarat, Tamil Nadu, Assam, Tripura, and Himachal Pradesh have taken significant steps in Disaster Risk Reduction (DRR). These states have invested in building disaster-resilient infrastructure and early warning systems. Also, capacity building by some states has led to a lower risk to their population economy.
3. The western part of the country, including Rajasthan, Gujarat and some parts of Maharashtra are hit very frequently by drought situation. If Monsoon worsens the situation spreads in other parts of the country too. The disturbance in the pressure conditions over oceans, results into cyclones in coastal regions. The Geo-tectonic movements going on in the ocean floor make the coastal region prone to tsunami disaster too.
4. Extreme positive departures from the normal maximum temperature result in a heat wave during the summer season. The rising maximum temperature during the pre-monsoon months often continues till June, in rare cases till July, over the northwestern parts of the country.
5. India has a coastline of about 7516 kms, it is exposed to nearly 10 percent of the world's tropical cyclones. About 71 percent of this area is in ten states (Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Puducherry, Andhra Pradesh, Orissa and West Bengal). On an average, about five or six tropical cyclones form in the Bay of Bengal and Arabian sea and hit the coast every year. Out of these, two or three are severe.
6. The northern parts of India, specially the hilly regions and the adjoining plains, are influenced by transient disturbances in the mid latitude westerlies which often have weak frontal characteristics. These are known as western disturbances. The cold waves mainly affect the areas to the north of 20° N but in association with large amplitude troughs, cold wave conditions are sometimes reported from states like Maharashtra and Karnataka as well.

8. Health Risk

Common health risks which affect and are likely to affect western India due to climate change are:

1. Flooding associated with increased rainfall and high sea levels coupled with increased surface air temperature, which is likely to cause a higher incidence of vector- and water-borne diseases.
2. The seasonal pattern or temporal distribution of major vector-borne diseases such as malaria, filarial, dengue, chikungunya, and other diseases such as tick-borne diseases, cholera and some other diarrheal diseases also changes with change in rainfall, temperature and humidity. Contaminated water supplies during heavy rainfall and similar disasters are one of the leading causes of diarrhea, cholera, hepatitis A etc.
3. Temperature rise will also be favorable for the spread of vector-borne diseases (malaria, kala-azar, dengue) into new areas by shortening the development duration of vectors (mainly mosquitoes).
4. Procurement and pre-positioning of stocks and giving health prevention messages to communities).
5. Rising Projections for reduced rainfall, for instance, will reduce the amount of available freshwater for human use and consumption, leading to an increased risk of disease.
6. Climate change is affecting the seasonality of some allergenic species as well as the seasonal activity and distribution of some disease vectors.
7. Extreme weather events and the impact of coastal erosion may result in enormous economic and physical damage and is likely to be associated with severe mental distress.
8. High-density populations in low-lying coastal regions experience a high health burden.
9. Flood or drought, by contrast, would affect the primary sector and reduce crop productivity. This, in turn, could reduce food availability resulting in malnutrition or inadequate nutrition as well as nutrition-related diseases.
10. Specific issues, concerns and developments in states and UT's of Western India:
 - The summers have now become longer with higher temperatures. While the winter season has become shorter.

- There have been incidences of floods and coastal floods in the region, even Rajasthan.
- The heat wave cases in Gujarat, Rajasthan and Madhya Pradesh have become more intense and frequent in the recent years.
- Due to changing climate, there have been rising cases of Crimean-Congo Haemorrhagic Fever, Swine flu, zika virus, malaria, respiratory infections, dengue and leptospirosis.
- The incidence of vector borne diseases has also gone up.
- There are even issues related to shortage of human resources that is properly trained for handling emergency situations.
- Health Infrastructure is not resilient enough to withstand the effect of climate disasters.
- Due to climate change, even food production is going down.

9. Regional Consultations

To understand the regional health issues of India five Workshops were organized. One National Workshop “National Programme on Climate Change and Health Sector Resilience” was 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 regional workshops were organized in Lucknow, Kolkata, Hyderabad and Ahmedabad respectively. Objective of conducting the regional consultations (Fig 3):

- To understand the regional impact of climate on health
- To get familiarized with the nature and characteristics of regional health issues
- To conceive possible mitigation and adaptation pathways

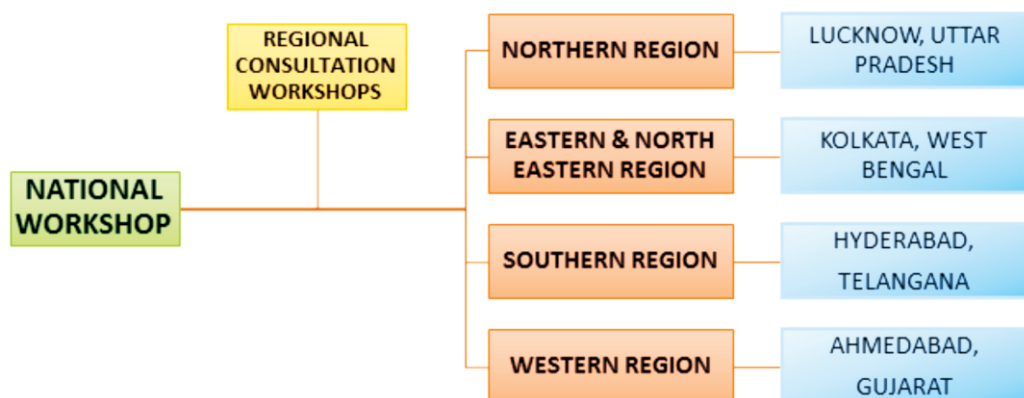


Figure 3: Details of the Consultation workshops organized in national and regional level

9.1 Western Region Consultation

For Western regions of India, Hazard Risk Vulnerability and Capacity Assessment (HRVCA) Workshop had been organized on 27th November, 2019 at Ahmedabad. 34 Experts from all Southern 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 (Fig 4).

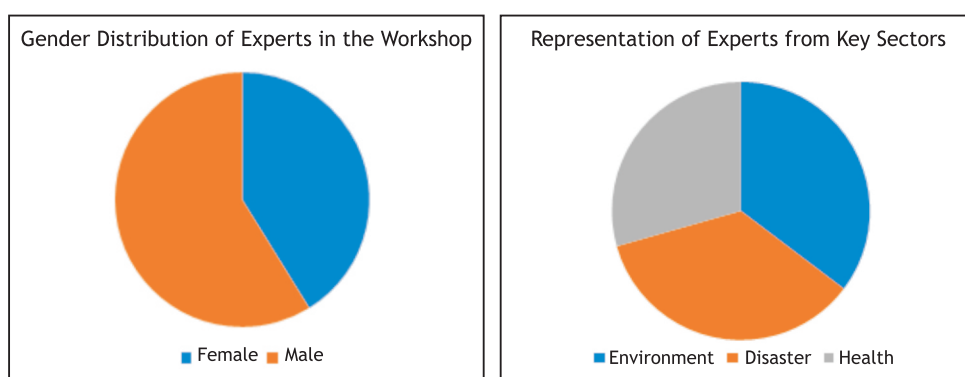


Figure 4: Percentage of Male and female experts in the workshop (Left)
Percentage of experts from Climate, Disaster and Health sector (right)

9.2 Key Stakeholders

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, State Disaster Management Authority, Department of Environment, Directorate of Health & Family Welfare Department, Indian Institute of Social Welfare & Business Management, School of Water Resources Engineering, Regional Meteorological Centre and 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 four groups named Narmada, Tapi, Sabarmati and Mahi. Each group had equal representation of experts from climate, disaster and health sector. They were given a framework for discussion that included topics pertaining to Hazard, Risk, Vulnerability and Capacity Assessment of health conditions of the various states of Western region of India. The discussion included but was not limited to the following issues:

9.3 Key Questions

During the consultation, following key questions were put forward to the experts for their views and feedback.

- Spatial and temporal shifts in climatic and weather patterns including events in the Southern 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 the past 15 years
- Region-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.

10. Health Issues for Adaptation and Disaster Risk Reduction

Health Problems and issues	Consensus of the Experts
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
Drinking Water Quality	1. Natural recharging of water has got affected. 2. TDS, chloride content has increased in ground water. 3. Salinity of ground water has risen 4. As per NitiAyog per capita water quality has reduced. This Leads to many chronic diseases
Extreme Natural Events	Numbers and intensities have increased resulting in higher number of deaths
Increased Cyclone Intensity	Crops and other resources are destroyed
Delayed Onset of Monsoon	Monsoon is being delayed by 40-45 days. Many districts are facing drought situation leading to crop failure
Scarcity of Reliable Data	Problems in proper forecasting Creates problem in assessing the real situation and restrains from making necessary strategies
Rising Temperature	Vector borne diseases like dengue and chikungunya are rising.
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
Heat wave events have risen	Heat strokes are rising and along with it the extreme events are increasing

Decrease in rainfall	1. Shift in rainfall pattern is unpredictable and drastic. 2. Minimal rains in Chennai.
River course change due to flood and increased soil erosion	Loss of resources and life
Water pollution	Harms the entire ecosystem
Reverse temperature change livestock productivity	Food industries are getting affected

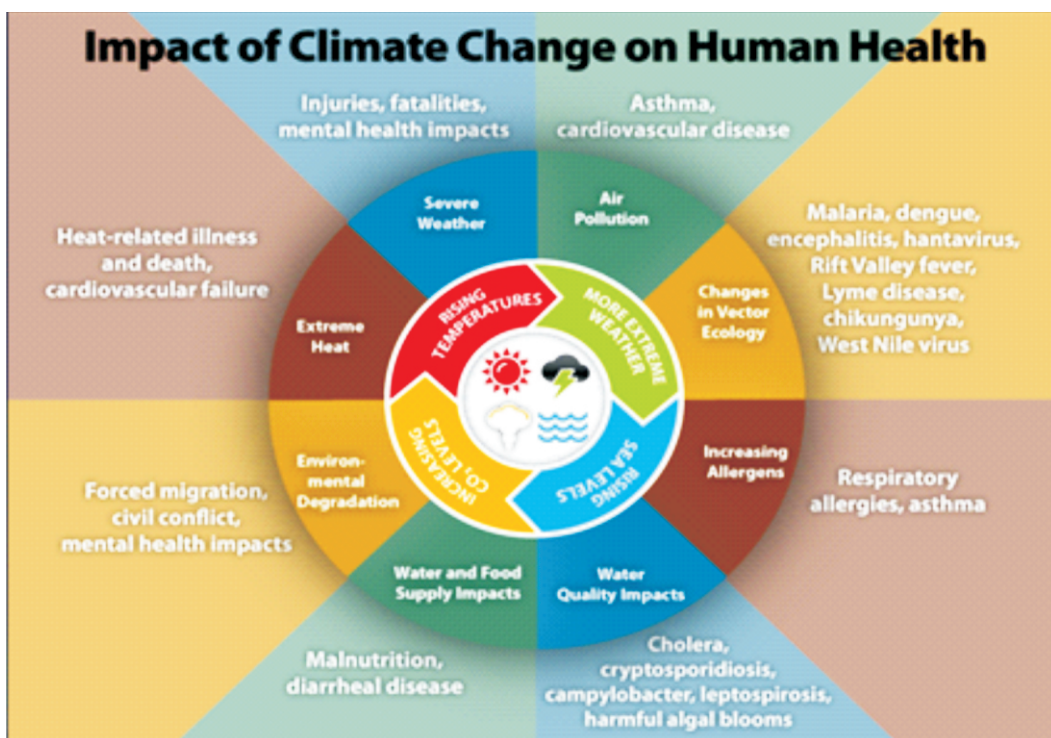


Figure 5: Impact of Climate Change on Human Health
Source - National Centre for Environmental Health, 2019



Figure 6: Snapshot from HRVCA workshop at Ahmedabad for building Health Resilience

11. Interventions

To adapt to the health risks being posed by climate change, a multi-level effort is needed across states and UT. Infrastructure, research, capacity building and public awareness are the critical elements of adaptation to climate change by the health sector. Disaster preparedness of health care facilities is also an essential element.

11.1 Policy Intervention

At the national level, several interventions like National Vector Borne Diseases Control Programme, Revised National TB Control Programme, Maternal and Infant deaths control programme and Education and literacy programs have been taken up to increase the health-related resilience.

Regulations to create a synergy between public and private healthcare sectors are needed. Regulations and guidelines for post disaster waste management, including Bio-medical waste are needed. District level health plan for climate change can be made. Climate change and its effect on Health has to be taken in mission mode like swacch-bharat mission so that all individuals are able to contribute from the ground level.

The Gujarat State Action Plan: Prevention And Mitigation of Impacts of Heat Wave 2020 has been developed to reduce extreme heat impacts on vulnerable people like Children, pregnant women and elderly people with early warning system and integrated coordination with concerned agencies. Such an action plan may be adopted by other states to combat the effects of extreme weather events prone to the area specifically.

In Bihar, Maharashtra, Karnataka and Gujarat, fewer than 40% of the households had at least one member covered by health insurance, according to the National Family Health Survey-5 (2019-20). Also, in these States, the number of household members who generally chose to go to private-sector clinics/hospitals for treatment was relatively higher than in other regions. So, households in these States spent more on health as the average expenditure for hospitalisation cases was seven times higher in the private sector compared to the public sector, according to the latest NSSO report on health. While the problem was acute in these four States, insurance coverage was in general very low across many States. There is thus a need to invest more in public healthcare insurance for better health coverage.

Post-disaster, it is essential to develop the capacity to monitor mental health, reproductive health, make provisions for special needs of females apart from the provision of emergency shelter, sanitation, food and water. It is also essential that disease surveillance is followed appropriately post-disaster.

11.2 Infrastructure and Facilities Related Interventions

Some of the common interventions needed are:

- Increasing the number of hospitals and improving facilities in existing hospitals.
- Improving sanitation conditions to curb the spread of water-borne disease like cholera, typhoid.
- Allocating a dedicated fund for training and awareness programs of health professionals, policy makers etc.
- Curbing pollution due to industries and vehicular emissions.
- Increased access to health care for vulnerable populations through the development and staffing of new health care facilities.
- Percentage of the population served by Primary Health Centers and Hospitals.
- Access to health care improves the resilience of the population to withstand any outbreak of diseases as an effect of climate change.
- All healthcare facilities and related infrastructures can be made disaster resilient.
- Eco- Friendly infrastructures for all facilities can be encouraged.
- Town planning guidelines can be laid down to ensure provision of green corridors. And green healthcare systems and resilient infrastructures.

- Annual evaluation of health system infrastructure can be done.
- The rural areas need better and more accessible public-healthcare facilities.

11.3 Capacity Building

- Periodic preparedness drills can be done to make sure all health professionals, support staff and other resource persons knows their roles and duties.
- Proper training to use facilities and equipment at the time of emergency can be given.
- Quality research can be encouraged to better utilise local resources and technologies for every region.
- Better incentives and provisions can be made for resource persons to keep them motivated and help them function better.
- Persons with high occupational vulnerability can have flexible working hours.
- Proper resources for service providers have to be arranged adequately, so that their work can be made easier.
- Awareness camps can be arranged regularly for the keeping the health professionals updated with latest knowledge.
- The competence of grassroots level workers has to be increased.
- There is a need for inclusion of climate change and its disaster, health implications in the school and college curriculum for sensitization of the youth.
- Regular trainings can be provided to all service providers, to keep them updated with the current trends in health and disasters.
- Data consciousness can be inculcated at all levels of health system and academic programmes, so that better data is available for knowledge development.

11.4 COMMUNITY CENTRIC INTERVENTION

- Public awareness of health and climate change especially, public education on the prevention of diseases related to climate change.
- Health Surveillance through public participation.
- Promote health education and awareness concerning climate risks through schools and community-based organizations (CBOs).

- Awareness among local communities on waste disposal, sanitation, public health, etc. and Augment the facilities for the safe disposal and management of bio-medical wastes.
- Community leaders and health mascots to assist with community approach and intervention can be utilized for generating awareness, tracking signs and symptoms related to vector-borne and heat stress.
- Awareness of the importance of hygiene is the important to reducing a community's vulnerability to extreme weather events and more long-term changes in average water availability or average temperatures.
- Strengthen short-term weather forecasts and seasonal forecasts for precautionary action related to health hazards.
- Health volunteering among local communities can be encouraged.
- Community champions can be selected from amongst the community for capacity building.

11.5 Others

- Intersectoral coordination between the environment/climate change department, disaster management department and the health sector institutions is essential.
- Regular meetings can be held, among all stakeholders, to address forthcoming season specific risks.
- Resources that are already available can be used more efficiently.
- Social media platform can be used for information dissemination related to upcoming disasters and diseases in the region.
- The central public procurement system for medical inventory has to be strengthened at state, district and even block level in all states for emergency response.
- More recruitments can be made at grassroots level to collect and disseminate information better.
- There is a need for better data sharing through official portals for reliability.
- Better investment has to be done in disaster management and healthcare system strengthening.
- There is a need for professionals who can interpret meteorological data and warnings in terms of their health implications.

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.



Resilient India - Disaster Free India

National Institute of Disaster Management
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