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Government of India

Ministry of Health and Family Welfare

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STATE ACTION PLAN FOR CLIMATE CHANGE & HUMAN HEALTH

UTTARAKHAND

(Revised Version- 10.10.2022)

National Programme on Climate Change & Human Health
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State Action Plan for Climate Change and Human Health 2022-2027

Govt. of Uttarakhand

Uttarakhand

National Centre for Disease Control
Government of India

National Programme on Climate Change and Human Health

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Graphic Layout & Design by- Avnesh Sharma, Technical Officer-NPCCHH, Delhi

EXECUTIVE SUMMARY

Climate-sensitive illnesses are increasing due to climate variations and rise in extreme weather events either through direct changes in temperature, precipitation and occurrence of heat waves, floods, droughts and fires or indirect impacts (ecological disruptions resulting in crop failures, shifting patterns of disease vectors, or displacement of populations, etc.). The Sustainable Development Goal 13 (SDG 13) emphasises to "take urgent action to combat climate change and its impacts".

In developing countries like India, the health of human population is sensitive to the shifts in weather patterns and other aspects of climate change, owing to high population, rapid industrialisation, large scale rural to urban migration resulting in unplanned urbanization, depletion of forest cover, high energy consumption, variation in food production, clean air, vector borne diseases, potable water supply, sewage and waste management, and access to health care.

Climate change is among the greatest health risks of the 21st century. It affects social and environmental determinants of health like clean air, safe drinking water, sufficient food, and secure shelter. Climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways

In this background, the proposed "State Action Plan on Climate Change and Human Health (SAPCCHH)" may take a multipronged approach to address the health-related aspects of climate change. The SAPCCHH is envisioned to strengthen the health of citizens of Uttarakhand against climate-sensitive illness, especially among the vulnerable groups like children, women, and marginalized population. The goal is to reduce the morbidity, mortality, injuries, and health vulnerability to climate variability and extreme weathers. Objective is to build capacity of health care services against adverse impact of climate change on human health.

The SAPCCHH Uttarakhand covers vision, goals and objectives of health planning in respect to the changing climate. The implementation plan describes inputs and processes for next 5 years and expected outputs and outcomes.

The SAPCCHH also describes the operational framework for implementation, systematic structures and roles and responsibilities of State, District and peripheral governing bodies, Task Forces and Environment Health Cell. It depicts the burden of climate change-sensitive illnesses, strategies and scope of work, advisory and key priorities, and tentative physical and financial planning.

Dr. Pankaj Kumar Singh
State Nodal Officer- Climate Change and Human Health
State Nodal Officer- IDSP, Uttarakhand

Chapter 1
Introduction

Climate change is defined as, "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*." It affects the social and environmental determinants of health like clean air, safe drinking water, sufficient food, and secure shelter.

Climate change may negatively affect human health through a number of ways, but the commonly experienced are increased frequency and intensity of heat waves leading to rise in heat related illnesses and deaths. High temperature is known to increase the level of 'ground level ozone' and other 'climate altering pollutants' other than carbon dioxide, which further exacerbate cardio-respiratory and allergic diseases as well as certain cancers. Beside these, there is an increase in transmission and spread of infectious diseases, changes in the distribution of water-borne, food borne, and vector-borne diseases, and effects on the risk of disasters and malnutrition.

The *United Nations Framework Convention on Climate Change (UNFCCC)* came into force on 21st March 1994. Since then many steps have been initiated to reduce the effect of climate change at the global level including "Rio Convention 1992", "Kyoto protocol 1997", "Male' Declaration 1998", "Convention of Parties", "Cancun Agreement 2010", "Durban Platform 2011", and "Nationally Determined Contributions" (NDCs) at the Conference of Parties 21".

India is a signatory to the "*Male' Declaration"* which calls for the strengthening of the health sector and achieving climate resilience. According to the "Male' Declaration", it is desired that the health-care facilities should be prepared to address the human needs in face of climate change-induced vagaries and adopt climate-resilient practices, particularly to encourage that these are able to withstand any climatic event, and that the essential services such as water, sanitation, waste management, and electricity are functional during such events. Further, for achieving climate resilience, health department has to undertake measures to initiate the greening of the health sector by adopting environment-friendly technologies, and using energy-efficient services.

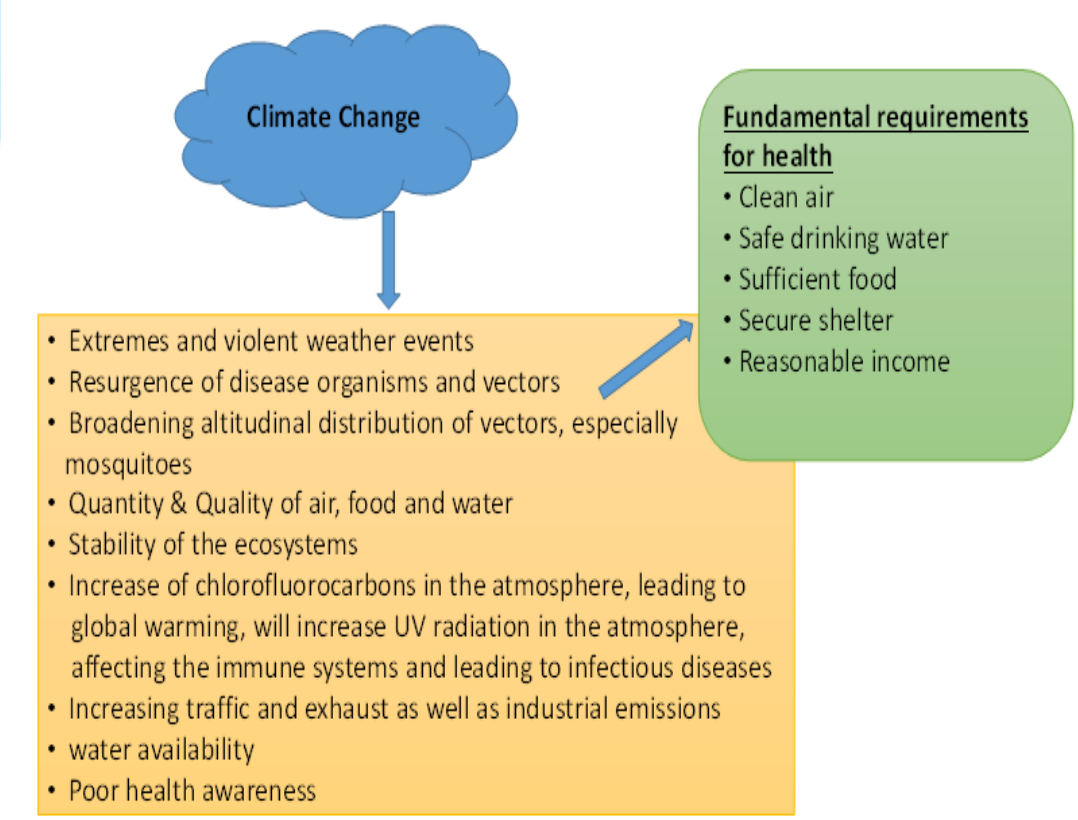
In this regard, initiatives undertaken by the Government of India include identification of Ministry of Environment, Forest & Climate Change (MoEF&CC) as the nodal ministry, formulation of the National Environmental Policy 2006, and formulation of the Prime Minister's Council on Climate Change for matters related to Climate Change.

MoEF&CC has developed National Action Plan on Climate Change with eight missions. Later on, four new missions (including Health Mission) were identified. The *Health Mission* aims to reduce climate-sensitive illnesses through integration with other missions under the National Action Plan for Climate Change (NAPCC) as well as through programmes run by various ministries. As a follow-up action, the Ministry of Health and Family Welfare (MoHFW) constituted a National Expert Group on Climate Change & Health (NEGCCH) to prepare National Action Plan on Climate Change and Human Health (NAPCCHH) and recommend strategies for indicators, mitigation, capacity building, etc. for the health sector to respond to the climate emergency.

National Centre for Diseases Control (NCDC) is identified as the 'technical nodal agency' by MoHFW for the proposed National Mission on Health. The Centre for Environmental and Occupational Health Climate Change & Health (CEOH&CCH), NCDC, is implementing the National Programme of Climate Change and Human Health (NPCCHH), as a part of which State Action Plan on Climate Change and Human Health (SAPCCHH) has been prepared for Uttarakhand. SAPCCHH is a long-term vision and planning document prepared by the Department of Health & Family Welfare, Uttarakhand, applicable for up till year 2027. In Uttarakhand, the State Climate Change and Human Health Cell is working under NHM, Dte. Of Medical Health & Family Welfare to deal with climate change-related health issues in the state. Based on this document, district specific action plans will also be prepared. Uttarakhand state action plan highlights the current and future vulnerabilities to climate change in the state, the disease burden, and the initiatives to be undertaken by the state to reduce the same by addressing the climate-sensitive diseases and develop a climate responsive and sustainable health care ecosystem in the state.

It is desired that health-care facilities should be made climate-resilient, particularly to encourage that these are able to withstand any climatic event, and that the essential services such as water, sanitation, waste management, and electricity are functional during such events. Further, for climate resilient healthcare, the health department has to undertake measures to initiate the greening of the health sector by adopting environment-friendly technologies and using energy-efficient services.

The figure below shows how climate change is leading to generation or resurgence of risk factors which are directly or indirectly affecting the determinants or fundamental requirements of health like clean air, safe drinking water, etc.



State profile

Uttarakhand is one of the hilly states in the Indian Himalaya region. Formerly a part of Uttar Pradesh (UP), Uttarakhand (formerly called Uttaranchal) (Figure 5) was created as the 27th state of the Indian Union on 9 November, 2000. It lies in the northern part of India between the latitudes 28°43′ N and 31°27′ N and longitudes 77°34′ E and 81°02′ E, having a maximum dimensions of 301 km in the east-west direction and 255 km in the north-south and covering an area of 53,483 km2. The elevation ranges from 210 to 7817 m. The state shares its border with China (Tibet) in the north, Nepal in the east, inter-state boundaries with Himachal Pradesh in the west and north-west and UP in the south.

The state has two distinct climatic regions, mainly the hills and the relatively smaller plain region. The climatic condition of the plain region is very similar to plains. The hilly region has cold winters with snowfall for quite a long time, good rainfall in the monsoon, and mild summers. This climate attracts tourists for simply scenic beauty, adventure or even looking for a spiritual environment.

Geographic Profile*

- Population : 1.1 Crore (74% rural population)
- Total geographic area is 53,483 km^2, of which 86% is mountainous
- Vulnerable Population:

Under 5 Children	**15 Lakh**
Adolescent (10 – 19 yrs)	23 Lakh

Elderly (> 60 yrs)	09 Lakh

- Districts - 13, Blocks - 95, Villages - 16414
- Population density : 189 persons per sq. km.
- Sex ratio : 963
- Literacy rate : 79%

*Data as per Census 2011

The area under forest in Uttarakhand is 3.4 million hectares, which constitutes 61.45% of its total land available for utilization. Forests are largely distributed throughout the state, with conifers and Sal being the major forest formation.

Rainfall: The state is bestowed with a relatively high average annual rainfall of 1229mm. As per India Meteorological Department, normally the rains start in the state in late April and continues up to September. However, the intensity of rainfall increases during the months of June to September. Higher rainfall occurs during the first week of July. Rain continues through August until the first week of September.

Temperature: Summers are extremely hot with temperatures going above the 40°C mark and with a lot of humidity. Winters can be very cold with temperatures going below 5°C. The lowest temperature recorded is -5 to -7°C and highest is between 40°C to 45°C.

Healthcare Infrastructure in Uttarakhand:

The Government of Uttarakhand is committed to improve the health status and quality of life of its people, by focusing on health issues. Its main objective is to reduce the disease burden and create a healthy environment. The Government intends to reach the population with due attention to disadvantaged sections and the inaccessible and remote areas. It is the first state in India to adopt an integrated health and population policy.

District wise profile of government health institutions in Uttarakhand-

S. No	***Name of District***	***Number of Medical college (Govt/ Pvt)***	***Number of district/ sub district hospital***	***Number of CHC hospital***	***Number of PHCs/ APHCs***	***Number of Sub-centers***
1	Almora	1 (Govt)	4	9	66	204
2	Bageshwar		1	3	29	79
3	Chamoli		2	5	39	107
4	Champawat		3	0	18	66
5	Dehradun	3 (1 Govt/ 2 Pvt)	6	5	47	175

6	Haridwar		4	8	29	160
7	Nainital	1 (Govt)	4	10	45	141
8	Pauri Garhwal	1 (Govt)	4	13	93	221
9	Pithoragarh		3	4	53	160
10	Rudraprayag		1	2	38	66
11	Tehri Garhwal		2	11	54	198
12	Udham Singh Nagar		4	5	34	154
13	Uttarkashi		2	4	33	84
	Total	**6**	**40**	**79**	**578**	**1815**

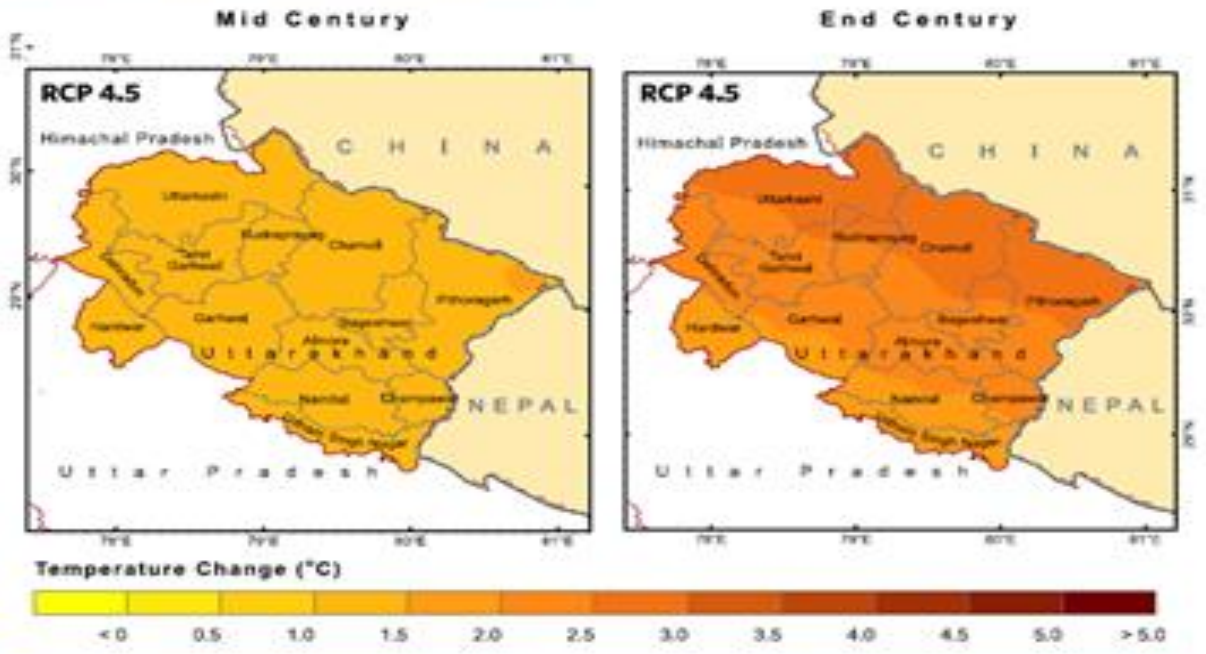
Chapter 2

Climate Vulnerability

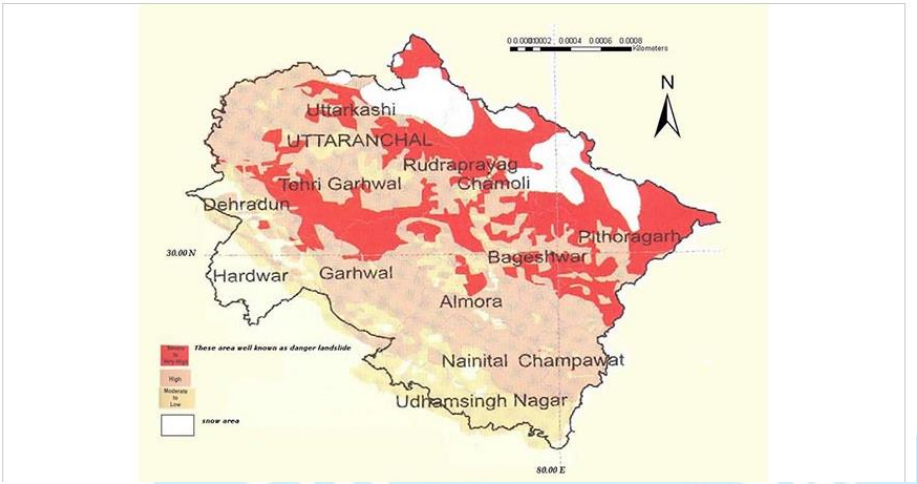
There is strong evidence that climate change affects human health. The effects can be direct, such as through increased heat stress and loss of life in floods and storms, or indirect, through changes in the range's disease vectors, such as mosquitoes, water-borne pathogens and water and air quality. The overall health effects of a changing climate are likely to be overwhelmingly negative. Climate Change affects the fundamental requirements for health including clean air, safe drinking water, sufficient food, and secure shelter. Giving the complexity of factors that influence human health, assessing health impacts related to climate change poses a difficult challenge.

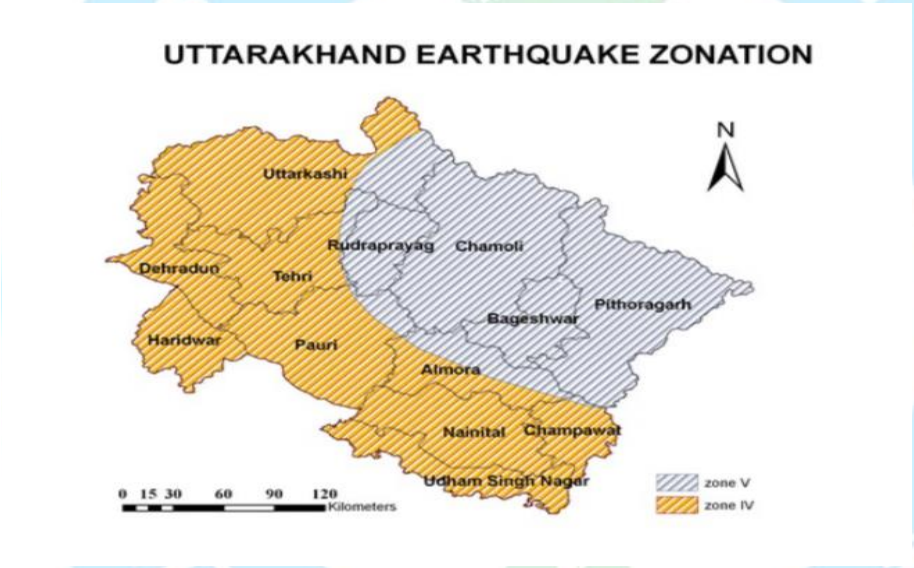
The details of state's vulnerability to extreme weather events is indicated in the maps presented below-

Projected Changes in Annual Maximum Temperature for Mid Century and End Century with respect to the baseline (1981 - 2010) for Uttarakhand



Landslide Hazard Zonation





Issues, Challenges, and Priorities

Issues and Challenges

• Climatic change leads to extremes and violent weather events.

• Climatic change causes a resurgence of disease organisms and vectors and a broadening altitudinal distribution of vectors, especially mosquitoes.

• Climatic change affects the quantity of air, food, and water and the stability of the ecosystems.

• The increase of chlorofluorocarbons in the atmosphere will lead to increased UV radiation, affecting the immune system and leading to infectious diseases.

• Increasing traffic and exhaust as well as industrial emissions are raising concentrations of SO2, NOx, O3 and suspended particulate matter, which are known to be damaging to human health.

• The impact of climate change on water availability is likely to be one of the most significant impacts for the health of population

• Difficult hilly terrain.

• Lack of human resources.

• Poor road connectivity.

• Poor health awareness.

• Inadequate health facilities.

Priorities

• Strengthening laboratory/diagnostic facilities

• Monitoring drug resistance, insecticide resistance

• Integrated behaviour change communication activities

• Public–private partnership

• Sentinel surveillance for dengue and Japanese encephalitis

• Integrated vector management

- Capacity building of medical and paramedical staff, including frontline workers.

Priority Impacts for Uttarakhand

Direct:

- **Natural Disasters**
  - ❖Flood
  - ❖Earthquakes

Indirect:

- **Vector Borne Disease**
  - ❖Dengue
  - ❖Malaria
  - ❖Scrub Typhus etc.
- **Food & Waterborne diseases**
- **Malnutrition**
- **Air pollution**
  - ❖Non Communicable Diseases
  - ❖Respiratory illness

State Vision and Commitment

The Medical Health and Family Welfare Department of Uttarakhand is committed to the health and well-being of all citizens and visitors to the state. As such, the department will take the necessary steps to gear up for the potential health impacts from climate change, while continuing to contribute to the achievement of the National Health Targets Plan.

Strategies

In line with the overarching principle of improving the scientific knowledge and evidence base and understanding climate change and its impacts on human health, the Medical Health and Family Welfare Department will begin building a strong evidence base including collecting, compiling and analysing relevant data and information in terms of the perceptions of affected people and communities.

Towards improving governance mechanisms, institutional decision making and convergence, the department will, as an immediate measure, review the State Health Policy to incorporate climate change concerns to human well-being and health and to initiate response mechanisms or preparedness for response mechanisms. Other initiatives will include the following:

- Undertaking measures to manage vector-borne and waterborne diseases.
- Better approaches to deal with heat wave conditions.
- Dealing with the physical and psychological impacts after extreme weather events.
- Addressing drought, malnutrition and food security issues.
- Addressing food safety issues arising due to increased ambient temperatures and extreme events.
- Traditional knowledge related to human (including livestock) healthcare needs to be studied, documented and appropriately promoted in the context of climate change adaptation.

Towards building adaptive resilience and reducing vulnerability across communities and sectors, the department will initiate mechanisms to build adaptive capacities both within the department and, potentially, among the citizens by:

- Undertaking reviews of the state's health infrastructure and potential climate change– related vulnerabilities and risks (and where such infrastructure is found to be at high risk, retrofitting to make these more climate resilient).
- Making it mandatory for construction of Green Buildings for all future government hospitals and offices and examining options for retrofitting existing buildings to 'green' these.

The department will initiate a range of capacity building measures including the following:

- Creating awareness among people about health hazards from climatic change, covering all areas such as rain water harvesting, energy efficiency, health hazards, water conservation, and protection from extreme climate conditions.

- Information, education and communication efforts.
- Behavioural change communications interventions in relation to the impacts of climate change.
- Training and sensitization sessions for department personnel.
- Capacity building of all the medical personnel of the district, the team of the Integrated Disease Surveillance Programme, the Disaster Management Cell, auxiliary nurses and midwives, anganwadi workers and members of ASHA and all the medical NGOs in the district to identify the early signs of extreme climatic effects on the population and their remedy.
- Exploring and promoting the scope for and piloting a tele-medicine services network in the light of the fact that the state has a hilly and inhospitable terrain and there is a serious scarcity of medical experts in the state.
- Developing and strengthening disaster management teams in every district hospital specifically to respond to the effects of extreme climate changes and to increase coordination between the health sector agencies in the state and the disaster management department.

The department also recognizes the need to mount an extensive health surveillance and analysis exercise integrated with monitoring of the climate and other environmental conditions that facilitate the outbreak of diseases. It will work towards developing such a framework. In addition, the department will initiate mechanisms to carry out the necessary research and other activities necessary to integrate climate concerns into public health emergency response strategies of the state. Where appropriate, the department will coordinate research efforts with various universities and other academic centres for excellence and collate lessons and pointers to inform policy and practice.

As part of the overarching strategy of documenting, sharing, learning and dialogue across the IHR, the department will initiate dialogues with its counterpart departments in other states of the region to exchange information, experiences and best practices, as well as examine the possibility of inter-state exchanges and capacity building initiatives.

The department also recognizes that climate change can have especially disproportionate adverse health impacts on the poor, women, and children and can therefore also adversely impact livelihoods. As such, it will begin planning investments in information and education programmes, designing them with a gender perspective, including gender-disaggregated data, etc. Traditional health care system is missing, which is a simplest and cheapest mode of delivering health facilities to masses especially rural masses. Traditional knowledge related to human and cattle healthcare needs to be given due place in this chapter and its documentation and application should be one of the strategy for climate change adaptation.

The private sector already plays a significant role in the health sector of the state, in terms of bringing in health care financing, management and service provision. A number of PPP projects in the health sector have been conceptualized, developed and implemented.. Additional planned measures include the following:

- Strengthening the existing 108 ambulance service, boat and air ambulance services, cardiac ambulances, etc.

- Strengthening mobile health vans.

- Strengthening cardiac and nephrology units with a public-private partnership.

The department, in close coordination with the PPP Cell of the Uttarakhand Government, will begin exploring the possibilities of incorporating climate-related health concerns into such projects and also the possibilities of private sector involvement in new initiatives to address the emerging challenge of climate change and its impacts on human health.

Chapter 3 - NPCCHH: Vision, Goal, & Objectives

Vision:

Strengthening of healthcare services for all the citizens of the state especially vulnerable groups like children, women, elderly, tribal and marginalized population against climate-sensitive illnesses.

Goal:

To reduce the morbidity, mortality, injuries, and health vulnerability due to climate variability and extreme weather.

Objective:

To strengthen the health care services against adverse impact of climate change on health.

Specific Objectives

Objective 1:

To create awareness amongst the general population (vulnerable community), health-care providers and policy makers regarding the impacts of climate change on human health.

Objective 2:

To strengthen capacity of healthcare system to reduce illnesses/ diseases due to variability in climate.

Objective 3:

To strengthen health preparedness and response by performing situational analysis at the state/ district/ below district levels.

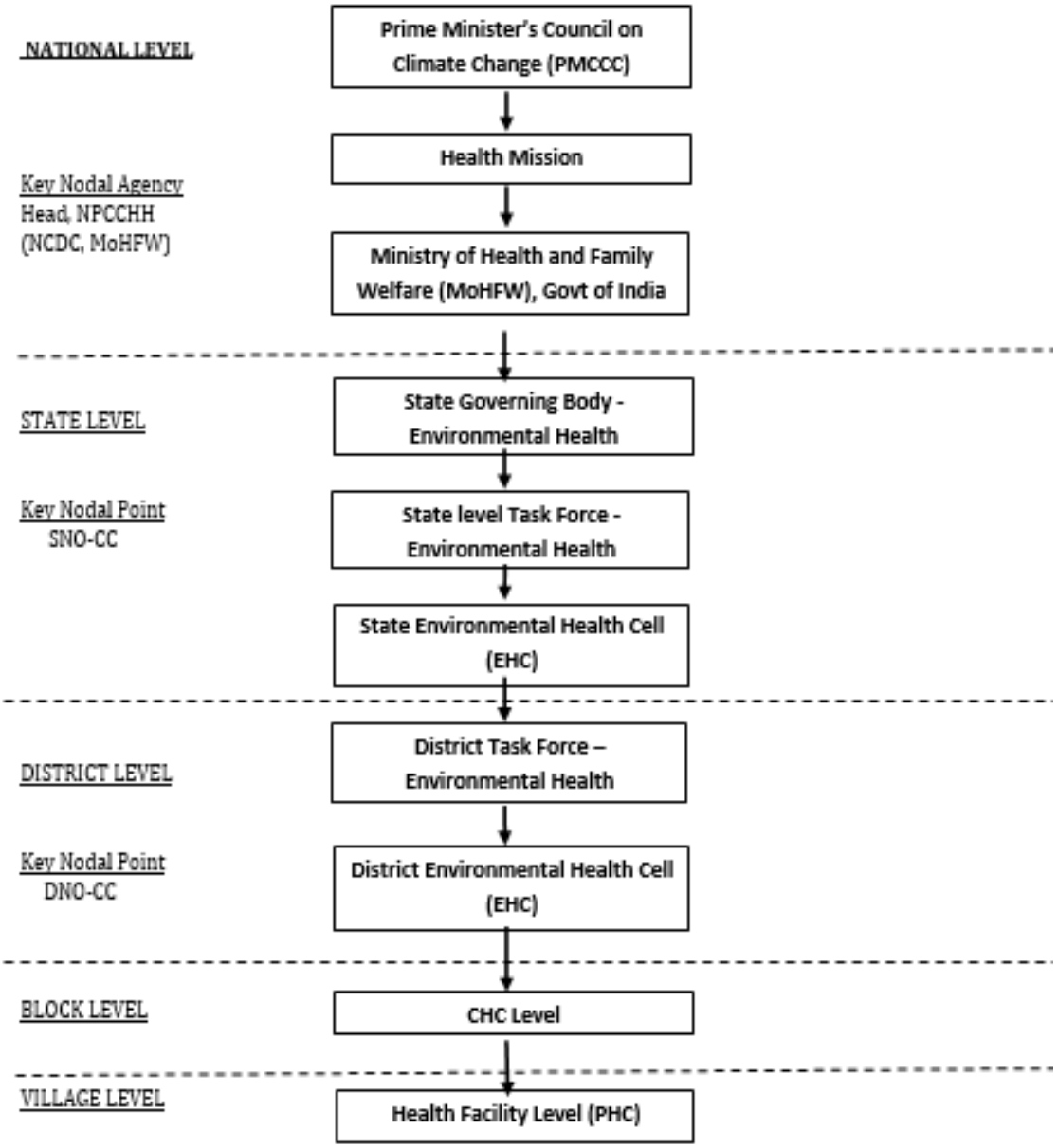
Objective 4:

To develop partnerships and create synchrony/ synergy with other missions and ensure that health is adequately represented in the climate change agenda in the state in coordination with the Ministry of Health & Family Welfare.

Objective 5:

To strengthen state research capacity to fill the evidence gap on climate change impact on human health

Chapter 4 - SAPCCHH: Organizational Framework



In Uttarakhand, the constitution of Governing Body is in process. State Climate Change & Human Health (CCHH) cell has been established. State Nodal Officer for CCHH has been nominated. State level Multisectoral Task Force under the chairmanship of Mission Director NHM is formed for multidisciplinary approach. Programme officers from different NHM programmes are engaged under the State task force. Experts from different departments are also identified in state task force. Presently State CCHH is operating with the resources of Integrated Disease Surveillance Programme, Uttarakhand. The establishment of placing dedicated human resource and infrastructure is under process.

State Level - Governing Body

The state level governing body for policy level decision shall be working under the Chairmanship of Honourable State Health Minister. The other members may be as follows:

Honourable State Health Minister	Chairman
Principal Secretary (Health*)*	*Vice Chairman*
Director Health Services/Head of Health System	Member Secretary
Mission Director-National Health Mission	Member
Principal Secretary, Ministry of Revenue (Disaster)	Member
Principal Secretary, Ministry of Agriculture	Member
Principal Secretary, Ministry of Water and Sanitation	Member
Principal Secretary, Ministry of Transport	Member
Principal Secretary, Ministry of Animal Husbandry	Member
Principal Secretary, Ministry of Environment and Forests	Member
Principal Secretary, Ministry of Women and Child Development / Social Justice	Member
Principal Secretary, Ministry of Science and Technology/ Earth Sciences	Member
Principal Secretary, Ministry of Education	Member
Principal Secretary, Ministry of Human Resource Development	Member
Principal Secretary, Ministry of Public Works Department	Member
Principal Secretary, Ministry of Power	Member
Principal Secretary, Ministry of Urban Development (Municipalities)	Member
Principal Secretary, Ministry of Finance	Member
Principal Secretary, Ministry of Law	Member
Principal Secretary, Ministry of Food and Civil Supplies	Member
Principal Secretary, Ministry of Panchayati Raj	Member
Regional Director -Health & Family Welfare (GoI)	Member
Director Medical Education and Research	Member
State Nodal Officer- Climate Change	Member
Head – NAPCCHH, CEOH&CCH Division, NCDC	Member

State Level Task Force - Environmental Health

This task force shall be working under the guidance of Principal Secretary (Health) of the state. It shall be directly overseeing the implementation of the State Action Plan for Climate Change and Human Health (SAPCCHH). It shall be working through the Directorate of Health Services (DHS) of the state, which will be the implementing agency for SAPCCHH.

The State level Task Force shall have inter-ministerial members which are suggested as:

Principal Secretary (Health*)*	Chairperson
Mission Director-National Health Mission	Vice Chairman
Director Health Services/Head of Health System	Member Secretary
Director/ Chairman - Department of Revenue (Disaster)	Member
Director/ Chairman - Department of Agriculture	Member
Director/ Chairman - Department of Water and Sanitation	Member
Director/ Chairman - Department of Transport	Member
Director/ Chairman - Department of Animal Husbandry	Member
Director/ Chairman - Department of Environment and Forests	Member
Director/ Chairman - Department of Women and Child Development / Social Justice	Member
Director, Meteorological department of State/UT	Member
Director/ Chairman - Department of Public Works Department	Member
Director / Chairman – Department of Urban Development (Municipalities)	Member
Director/ Chairman - Department of Education	Member
Director/ Chairman - Department of Food and Civil Supplies	Member
Director/ Chairman - Department of Human Resource Development	Member
Director/ Chairman - Department of Power	Member
Director/ Chairman - Department of Finance	Member
Director/ Chairman - Department of Law	Member
Director/ Chairman - Department of Panchayati Raj	Member
Director/ Chairman - State Ground Water Board	Member
Head - State disaster Management Authority	Member
Environmental Engineer/ Scientist from Ministry of Environment	Member
Chairman, State Pollution Control Board	Member
Regional Director -Health & Family Welfare (GoI)	Member
Director Medical Education and Research	Member
State Nodal Officer- Climate Change	Member
Director, ICMR Institute/Centre (if any branch in the State/UT)	Member
State Surveillance Officer	Member
Head – NAPCCHH, CEOH&CCH Division, NCDC, MoHFW	Member

Head, NCDC Branch of the state	Member

The Task force of the State/ UT's Environmental Health Cell will coordinate with the Centre (MoHFW, NCDC) for the execution of state/ UTs SAPCCHH.

DHS will create an ***Environmental Health Cell*** within State Health Department, and will identify a ***Nodal Officer*** from Health department which preferably should be a senior Public Health Expert of the state.

The proposed State Level Structure of the Environmental Health Cell is as follows:

Structure at State/ UT Environment Health Cell:

Nodal Officer (Public Health Expert - State Health Department)	**1**
Consultant-Capacity building/ Training/ HR Management	**1**
Consultant-Environmental Health	**1**
Data Manager & Analyst	**1**
Secretarial Assistant cum Data entry Operator	**1**

Roles and Responsibilities of the State/ UT Environmental Health Cell

- Preparation and implementation of State Action Plan for Climate Change and Human Health
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate-sensitive illnesses in the state.
- Assessment of needs for health care professionals (like training, capacity building) and organise training, workshop and meetings.
- Maintain state and district level data on physical, financial, and epidemiological profile for climate sensitive illnesses.
- Ensure convergence with NHM activities and other related programs in the state / district
- Monitor programme, review meetings, and field observations.
- Timely issue of warning/ alerts to health professionals and related stakeholders as well as general public through campaign or using mass media (electronic or printed)
- Social mobilization against preventive measures through involvement of women's self-help groups, community leaders, NGOs, etc.
- Advocacy and public awareness through media (street plays, folk methods, wall paintings, hoardings etc.)
- Conduction of operational research and evaluation studies for climate change and its impact on human health.

District Level:

The DHS has appointed the District Medical Officer/ Chief Medical Health Officer as the District Nodal Officer – Climate Change. A District Level Task Force will be constituted by the District Nodal Officer- Climate Change in consultation with the SNO-CC.

Structure of District Level Task Force- Environmental Health

District Collector	Chairman
Dean – Govt Medical College in the district/ Head- Department of Community Medicine of the Medical College	Vice Chairman
Chief Medical Officer/ District Medical Officer / District Nodal Officer – Climate Change.	*Member Secretary*
District Surveillance Officer	Member
District Programme Manager – NHM	Member
District Head, Department of Revenue (Disaster)	Member
District Head, Department of Agriculture	Member
District Head, Department of Water and Sanitation	Member
District Head, Department of Transport	Member
District Head, Department of Animal Husbandry	Member
District Head, Department of Environment and Forests	Member
District Head, Department of Women and Child Development / Social Justice	Member
District Head, Department of Science and Technology/ Earth Sciences	Member
District Head, Department of Education	Member
District Head, Department of Food	Member
District Head, Department of Human Resource Development	Member
District Head, Department of Public Works Department	Member
District Head, Department of Power	Member
District Head, Department of Finance	Member
District Head, Department of Law	Member
District Head, Department of Panchayati Raj	Member

The District Environmental Health Cell will be constituted by the District Nodal Officer-Climate Change in consultation with the SNO-CC At the district level, a District Environmental Health Cell shall be constituted; which shall be comprise of the following:

Structure at District Environment Health Cell:

District Nodal Officer- Climate Change	Chairman
District Veterinary officer	Member
District Surveillance Officer/ District Epidemic Officer	Member
District RCH officer/FW Officer	Member
District Epidemiologist	Member
District Microbiologist	Member
District Immunisation Officer	Member
District Training Officer	Member
Data entry operator	Supporting staff

Roles and Responsibilities of the District Environmental Health Cell

- Preparation and implementation of District Action Plan for Climate Change and Human Health.
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate sensitive illnesses in the district.
- Maintain and update district database of illnesses identified in the district.
- Assess needs for health care professionals and conduct sub-district/ CHC level training/ workshop, and meetings for capacity building.
- Ensure appointment of contractual staff and engage them in the assigned task of data management under the NAPCCHH.
- Maintain district level data on physical, financial, and epidemiological profile for these illnesses.

Community Health Centre Level

The proposed CHC Level Structure is as under:

- Medical Superintendent (CHC Hospital) : Chairman
- Taluka Health Officer/ Talukas Health Officer : Member Secretary
- Health Education Officer/ Similar Post : Member

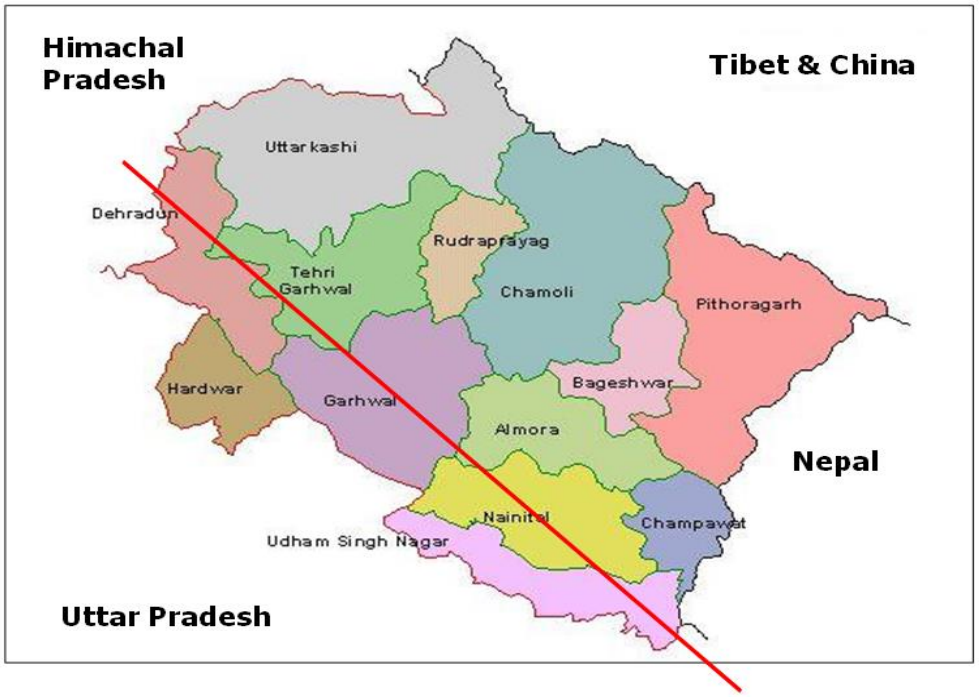
- Block Development Officer : Member
- Health Supervisor : Member

Health Facility Level (PHC):

At the health facility, the responsibility for implementation will lie with the Medical Officer (In-charge) of the facility. The existing machinery of NHM will be utilised for the related activities. The Rogi Kalyan Samiti (RKS) would be reviewing and monitoring implementation at the health facility level. The ANM, ASHA, and Anganwadi worker will assist in activities related to implementation of action plan at the local level.

Chapter 5 - Climate Sensitive Diseases or issues prevalent in Uttarakhand

Below is the map of Uttarakhand. The red line demarcates between plain and hilly region. Priority climate-sensitive health events may be different on both sides of red line.



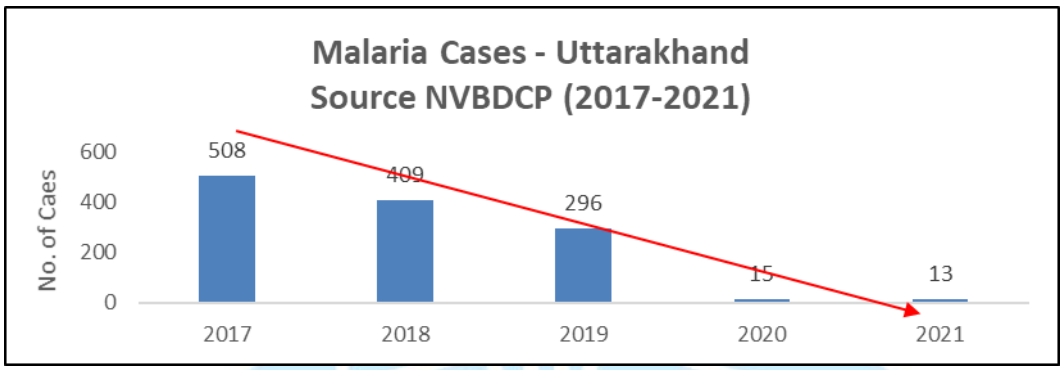
Uttarakhand state is divided in two regions i.e. Garhwal and Kumaon. There are 13 districts in Uttarakhand state (7 districts in Garhwal region and 6 districts in Kumaon region). Geographically most of districts are situated in hilly region. 5 districts are more sensitive for climate change-related illnesses i.e. Dehradun, Haridwar, Udham Singh Nagar, Nainital, and Pauri which are considered as plain/mid plain areas.

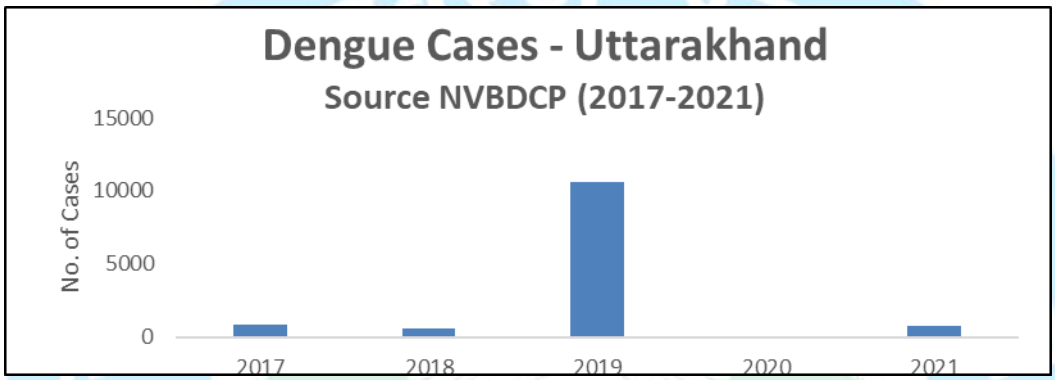
Climate Sensitive-Illnesses in the State:

- Vector Borne Diseases
- Water Borne Diseases
- Acute Respiratory Illnesses
- Food security and Nutrition
- Zoonotic Diseases
- Disasters or Extreme weather events affecting health

Vector Borne Diseases: Climatic diversity is one of the utmost reasons for the persistence of malaria in India. The factors that cause concerns for malaria disease in India are the changes in temperature and rainfall patterns owing to climate change. In Uttarakhand state, it is found that changes in climate have a direct impact on the plain areas of the state which are vulnerable to various vector borne diseases like malaria. Out of the 13 districts of the State, there are only 4

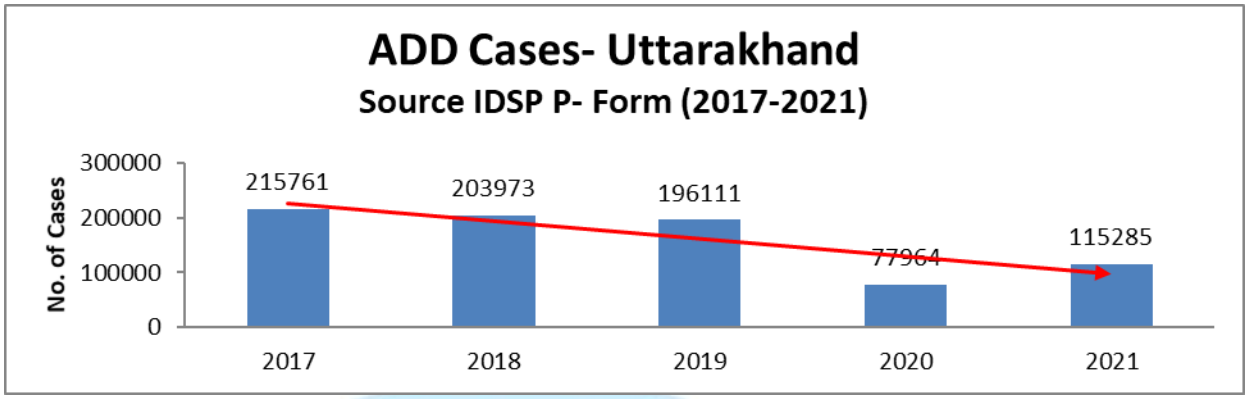
districts which are in plain stations and the remaining are in hill stations namely Dehradun, Haridwar, Udham Singh Nagar, and Nainital.

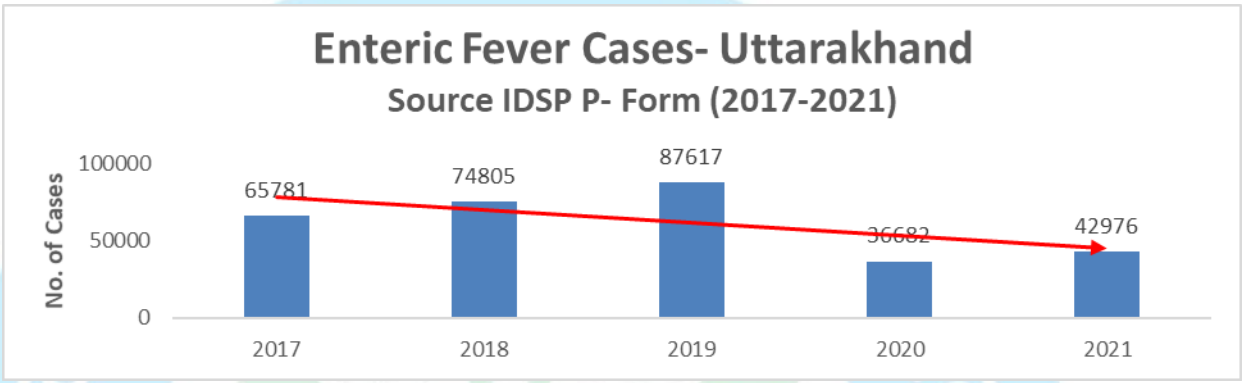




Water-Borne diseases: Most of the drinking water sources of Uttarakhand are surface water sources, which are directly exposed to point sources of pollution such as septic tanks, domestic and farming wastes, as well as to soil with high humus content. In the Kumaon region, about 97% and 88% of raw water sources were contaminated due to total coliform and faecal contamination bacteria. The report of bacteriological monitoring of raw and supply water sources of all districts of Uttarakhand concludes that the water quality status of natural raw water sources like gadheras, rivers and springs, etc. requires regular monitoring in Garhwal as well as Kumaun region. Around 80% of illnesses and deaths are related to waterborne diseases like cholera, hepatitis A, typhoid and dysentery as the most dangerous diseases in India. A 2019 joint report of WHO and UNICEF had pointed out that globally, one in four healthcare facilities lacked basic water servicing and one in five had no sanitation services and 42% had no hygiene facilities at the point of care.

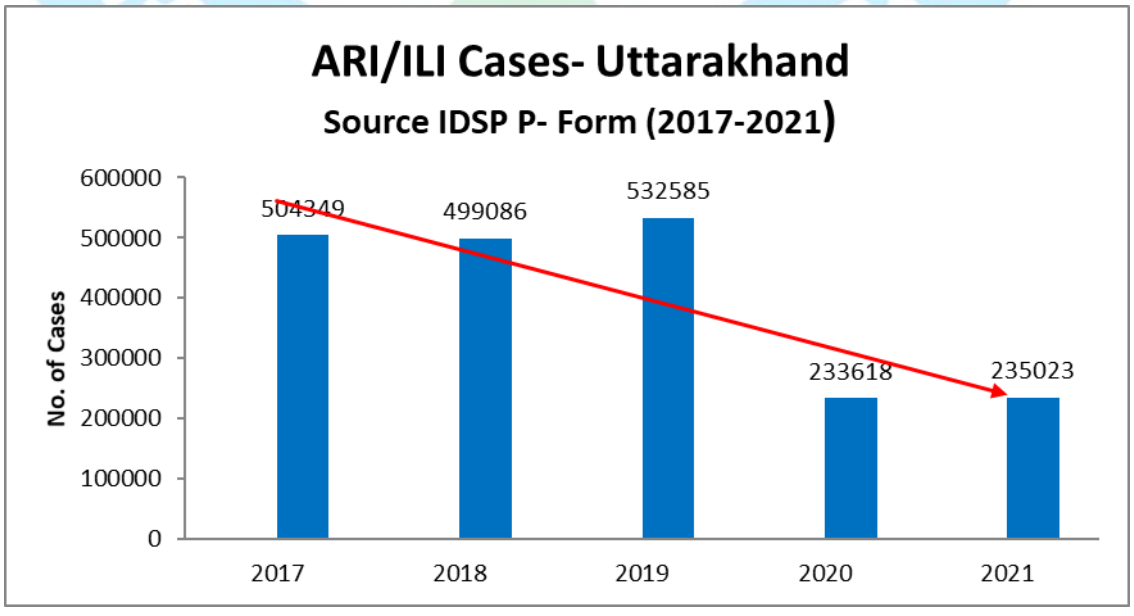
Main water-borne diseases and their causative agents as reported by medical practitioners during their lectures in tribal areas of Garhwal region, Uttarakhand are Cholera, Typhoid fever, Shigellosis, Acute Diarrheal Disease, and Salmonelosis.





Acute Respiratory Illness: Acute Respiratory Illness (ARI) is a cause of death globally, causing approximately 19% of all deaths before the age of 5 years, according to a World Health Organization estimate. Indoor air pollution from biomass fuels, which is strongly poverty-related, has long been regarded as an important risk factor for ARI morbidity and mortality.

Long-term exposure to high concentrations of PM2.5 may increase risk for acute respiratory problems in small children.



Nutrition and Food security: Agriculture is strongly linked with climate. In the mountains, where fields are mostly unirrigated, temperature and rainfall patterns are all the more important in determining crop selection and productivity. Changes in regional climate are will thus impact agricultural systems. Impacts of climate change will vary from one region to another. In areas where temperatures are already close to the physiological maxima of crops i.e. tropical regions, heat stress, and water loss due to evapotranspiration may lead to decline of yields while areas in mid and high latitudes the suitability and productivity of crops are expected to increase.

Some of the well-established direct impacts of climate change include; changes in mean temperature which may require adjustments to current practices of agriculture in order to maintain productivity; extreme weather events, including higher incidence of heavy rainfall, which may lead to short or long term productivity losses. Even small changes in rainfall pattern in the growing season can lead to a marked change in productivity of crops. Short term temperature extremes especially in the phases of plant development can also result in reduction of yield. Similarly droughts, both due to low rainfall or due to deficiency in soil moisture and increased plant water stress may result in crop failure or lowered yields. Heavy rainfall events on the other hand may completely wipe out entire crops over wide areas or excess water can lead to soil water logging, anaerobicity and reduced plant growth. Long terms impacts occur if the topsoil is washed away, which is a common result of extreme rainfall in heavily sloping areas. Indirect effects of climate change may be experienced by changes in incidences of pests and diseases.

Disasters or Extreme weather events affecting health : The state of Uttarakhand is highly vulnerable to multi-hazards viz. earthquake, flash-floods, landslides, hailstorms, avalanches, dam bursts, droughts, but particularly earthquakes, as the state falls in the highest seismic risk zones of the country i.e. Zone V and IV. The past record of seismic activity in the state and the tectonic profile, probability of a high impact earthquake, can be expected in future.

Almost every year the state is affected by one or more major landslides affecting the society in many ways. Loss of life, damage of houses, roads, means of communication, agricultural land, are some of the major consequences of landslides in Uttarakhand.

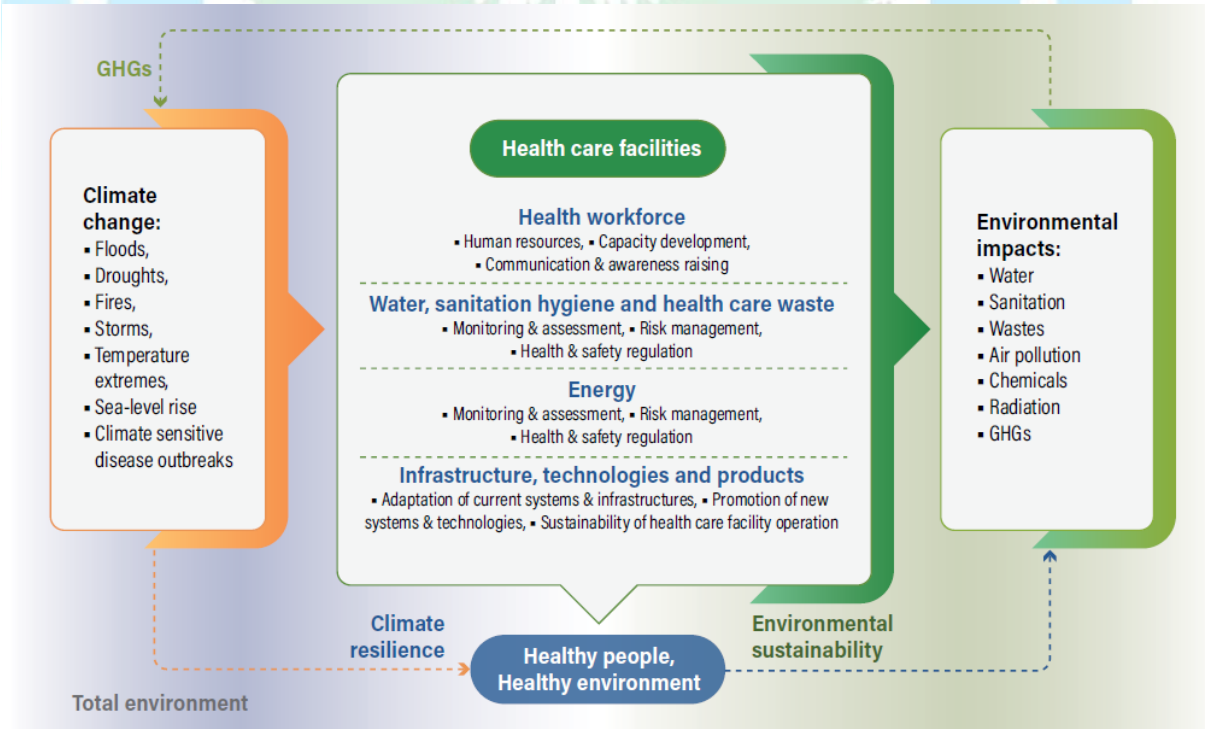
Deforestation in the Himalayas has increased the severity of floods during the rainy season and reduced steam flows and dried up springs during dry seasons. The increase in soil erosion has reduced the water carrying capacity of the rivers resulting into swallowing of riverbeds leading to floods in the plains.

Chapter 6 – Health Adaptation Plan for Green and Climate Resilient Healthcare Facilities

"Climate-resilient and environmentally sustainable health care facilities anticipate, respond to, cope with, and recover from and adapt to climate-related shocks and stresses, while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, so as to bring ongoing and sustained health care to their target population and protect the health and well-being of future generations. (WHO)".

As the climate continues to change, risks to health systems and facilities including hospitals, clinics, and community care centers are increasing, reducing the ability of health professionals to protect people from a range of climate hazards. Health care facilities are the first and last line of defence against climate change impacts as they can be responsible for large emissions of greenhouse gases (GHGs), and because they provide the needed services and care to people harmed by extreme weather and other long-term climate hazards.

Figure: Framework for building climate-resilient and environmentally sustainable HCF.



Source: WHO Guidance for Climate-Resilient and Environmentally Sustainable Health Care Facilities

The National Programme on Climate Change and Human Health (NPCCHH) is engaging critically with strengthening the healthcare services and facilities to adapt to as well as mitigate the impacts of climate change. The key components recognized under the programme include –

1. **Environmentally Sustainable (Green) Measures at Health Care Facilities**
   - **a.** Energy Auditing
   - **b.** Installation of LED lighting at Health Care Facilities
   - **c.** Installation of Solar panels
   - **d.** Water Conservation Measures – Rain water Harvesting
2. **Climate Resilient Infrastructure at Health Care Facilities including Retro Fitting of Existing Health Care Facilities**

1. Environmentally Sustainable (Green) Measures at Health Care Facilities

a. Energy Auditing:

An energy audit identifies all energy end-uses within the building, estimates how much energy is used in each department, and determines the amount of energy used in relation to the desired values.

The guiding principles in this respect include:

- The HCFs would develop a plan for the energy audit to assess the level of energy consumption.
- The responsibility for the energy audit would be of the IPC committee of the facility. If the healthcare facility lacks qualified staff, then the energy audit would be conducted by the state health department as well.
- The energy audit would also consider load management, poor maintenance aspects, and extreme temperature to avoid fire-related accidents. Audit would be conducted in the facility biannually.
- Installing sub-meters in the facility premises would be useful in understanding how much energy is used across the healthcare facility

b. Replacing the existing non-LED lights with LEDs: Replacing the incandescent bulbs with LEDs leads to 75% less energy consumption. Each LED light saves approximately INR 700-1400 over the course of a year.

The guiding principle in this respect would be:

- Healthcare facilities would have a policy on purchasing and using energy- efficient equipment and devices. The facilities would gradually phase out the incandescent bulbs with LEDs.

c. Installation of Solar panels: Healthcare facilities both in urban and rural areas consume a lot of energy throughout the day as the electrical equipment used directly or indirectly to treat patients requires uninterrupted power.

The guiding principle in this area would be:

- The state would, in a phased manner, install PV solar panels in unused spaces like the roof of the facility. This would reduce grid-based electricity consumption and decrease the peak demand of a facility, which means the organization has lower operating costs, and hence these saved costs can be utilized for better patient care.

d. **Water conservation**: In an HCF, sanitary fixtures consume 42 per cent of water while heating ventilation and air conditioning (HVAC) consumes 23 per cent of water, thus, major water-consuming area needs to be focused on reducing water consumption.

Rainwater harvesting for healthcare facilities has the potential to save thousands of litres of water every year. This in turn can result in substantial cost savings in addition to adopting climate-smart practices.

The guiding principles for water conservation in a HCF would be as follows:

- The healthcare facility would develop a strategy for the optimum usage of water.
- The HCFs would develop a plan for the conservation of water. e.g., water- efficient fixtures, dual flush mechanism, sensor-operated urinals, waterless urinals, rainwater harvesting
- The HCFs would have a plan for wastewater treatment. e.g., sewage treatment plant and effluent treatment plant at sites of generation of contaminated grey water, like pathology.
- The HCFs would develop a programme/plan for the conservation of water
- The HCFs would have a water management programme for the conservation of water by establishing a team, setting goals with timelines, conducting water audits, determining the cost of water, and preparing an action plan
- The HCFs would have an ongoing educational programme for the efficient usage and conservation of water for all the stakeholders (staff, patients and visitors)
- The HCFs would have a plan to train the staff on water savings techniques
- The HCFs would develop a wide variety of methods to communicate through IEC materials, new and/or revised operating guides and manuals

2. Climate Resilient Infrastructure at Health Care Facilities including Retro Fitting of Existing Health Care Facilities

It is essential that HCF planning and designing should be responsive to local climate and hazard profile of the district. Strong focus should be given to designing all aspects of infrastructure and services as per relevant IS standards, building codes and local byelaws, and history of emergencies in the district to ensure patient safety and continuity of health service during emergencies. Few key interventions that would be undertaken to make the HCFs into green buildings would include:

New Buildings

- Climate risk assessment at the time of planning and designing the building.
- Use of high-performance glass on windows, doors, and roofs to prevent the heat inside and allows sunlight and fresh air to enter the room.
- Use double glazing glass on windows; it provides thermal and optical properties to the building and reduce the noise level.
- Insulation of building from inside and outside in colder regions of the country.
- Ensure the plinth level is above the high flood level as known locally or storm surge level (in costal districts) and make the building accessible with ramps and railing to create a barrier free environment.
- Installation of Rainwater Harvesting System
- Installation of alternative energy systems
- Installation of STP & ETP

Existing Infrastructure

- Introduction of electronic patient records in the facility to reduce the use of paper.
- Availability of 10-30 per cent area for the herbal garden in the facility.
- Floor and wall finishes are conducive for infection prevention control practices.
- Modifications in the critical care rooms to make them functional during disasters.
- Installation of Rainwater Harvesting System
- Installation of alternative energy systems
- Installation of STP & ETP

Initiative for Climate Resilient infrastructure and Green Measures in Healthcare Facilities in Uttarakhand

Increasing global warming, heatwaves and rainfall related extreme weather events are the big challenges in the Uttarakhand state. HCFs need to take effective measures to withstand the impacts of increasing extreme weather events and other climate-related hazards such as higher temperatures, increasing precipitation over longer periods of time (causing increased flooding), intense but short-lived rainfall (causing flash flooding), decreasing precipitation (affecting places where rainwater harvesting contributes to the water supply systems of HCF), and higher winds and storms. Climate change can also create new or exacerbate existing environmental problems, such as increasing contamination of groundwater during droughts, or increasing air pollution. It is also increasing the risk of new and emerging infectious diseases and climate migration putting additional demand on HCF. Many of these hazards can have severe, acute, and long-term impacts on mental health (including that of health workers) putting greater pressure on health systems.

Considering the impacts of Climate change, the **State Climate Change & Human Health Cell has identified and targeted some health facilities for sustainable Climate Resilient infrastructure and** Green Measures in Healthcare Facilities in next two years (2022-2024)**.** Under the umbrella of National Health Mission, **the budget for the same has been calculated and approved by NPCCHH, NCDC Delhi, GoI.** In continuation, all the districts will be covered under this activity in next five years (till 2027).

Activity plan:

Under Climate Resilient infrastructure and Green Measures in Healthcare Facilities **following key activities are planned at identified facilities for next five years:**

Activities	Year 2022-23	Year 2023-24	Year 2024-2027
a. Energy auditing in Healthcare Facilities	**Rs. 32.40 Lakh**	**Rs. 64.80 Lakh**	**Budget will be calculated as per no. of health facilities/districts targeted.**
b. Replace existing lighting (Non-LED) with LED			

c. Installation of Solar Panels	1 PHC, 1 CHC, 1 DH of District Rudraprayag will be strengthened	1 PHC, 1 CHC, 1 DH of District Chamoli and Udham Singh Nagar will be strengthened	**All districts will be targeted till 2027 for Climate resilient health infrastructure.**
d. Install Rainwater Harvesting System			
e. Retrofitting Healthcare Facility Infrastructure (Climate/ Disaster resilient) in Districts as per IPHS guidelines.			

Objective	Activities	Priority districts	Identified Health facilities for 5 years for each	Target for 5 years 22 - 27				
				22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
Strengthening Healthcare System	Energy Audit	Rudraprayag, Chamoli and Udham Singh Nagar	1PHC, 1CHC, 1DH	20%	35%	50%	75%	100%
				10%	20%	50%	80%	100%
	Led installation-		1PHC, 1CHC, 1DH	10%	20%	50%	80%	100%
	Solar Panels installation		1PHC, 1CHC, 1DH	5%	10%	40%	70%	100%
	Rainwater Harvesting		1PHC, 1CHC, 1DH	5%	10%	20%	50%	100%
	Retrofitting of Health care facilities		1PHC, 1CHC, 1DH	10%	20%	50%	80%	100%

Roles and responsibilities:

State level Climate Change and Human Health Cell

- Assessment and approval for identified health facilities (shared by districts) for climate resilient infrastructure and Green measures based on disaster and vulnerability assessment.
- The State level Climate Change and Human Health Cell will identify and coordinate with all relevant departments/sectors at state level in developing the capacity for climate resilient health system.
- Overall monitoring and supervision of Climate Resilient infrastructure and Green Measures in healthcare facilities.
- Estimation and provision of budget for all activities.
- Regular capacity building and hand holding of District level Climate Change and Human Health cell.
- Provide National guidelines to District level Climate change and Human health cell.

District level Climate Change and Human Health Cell

- Identify health facilities for climate resilient infrastructure and Green measures based on disaster and vulnerability assessment.
- Prepare proposal and estimation of budget for the identified health facilities for all activities and share with the state.
- The District level Climate Change and Human Health Cell will identify and coordinate with all the relevant departments/sectors at the district level in developing capacity for climate resilient health system.
- Coordinate for energy auditing, ***energy conservation, solarization, rain water harvesting,*** retrofitting healthcare facility infrastructure (climate/ disaster resilient) etc.
- Regular capacity building and hand holding of District and Block level stakeholders.
- Monitoring and supervision of Climate Resilient infrastructure and Green Measures in healthcare facilities.
- Provide National guidelines to the block level and the health facility level.

Block level / Health facility level

- Identify health facilities for climate resilient infrastructure and Green measures based on disaster and vulnerability assessment.
- Prepare proposal and estimation of budget for the identified health facilities for all activities and share with the district level.
- Coordinate with all relevant departments/sectors in developing capacity for climate resilient health system.
- Conduct activities for energy auditing, ***energy conservation, solarization, rain water harvesting,*** retrofitting healthcare facility infrastructure (climate/ disaster resilient) etc.
- Provide Utilization certificate for the budget provided for climate resilient infrastructure and Green measures.

Medical officer

  - Conduct health facility assessment :Energy audit, Water audit
  - Lead water committee, sustainable procurement committee, and operational measures to make health facility functioning during disasters or power cut
- Support community level IEC activities
- Identify local funding opportunities: e.g. CSR initiative, NGO funding

Panchayati Raj Institution

- Support retrofitting and new health facilities with local funding source and community involvement

Chapter 7 - Health Adaptation Plan for Acute Respiratory Illnesses attributed to Air Pollution

Air Pollution is recognised as the greatest environmental risk to human health and is a preventable risk factor. It can affect every part of the body, particularly skin, respiratory tracts, cardiovascular, and cerebrovascular functions, etc. It may be associated with health problems like asthma, chronic respiratory problems like Chronic Obstructive Pulmonary Disease (COPD), cardiovascular problems like ischaemic coronary heart diseases, cerebrovascular events like strokes, cancers, diabetes, hypertension, etc. According to the report of Steering Committee on air pollution from the MoHFW (2015) and WHO reports on air pollution and health, particularly short term and long- term health effects due to air pollution are given below:

Health effects attributed to short-term exposure to air pollution	Health effects attributed to long-term exposure to air pollution
1. Respiratory & cardiovascular emergency department visits	1. Acute symptoms (Wheezing, coughing, phlegm production, respiratory infections)
2. Respiratory & cardiovascular primary care visits	2. Chronic respiratory diseases incidence & prevalence (asthma, COPD, chronic pathological changes)
3. Use of respiratory & cardiovascular medications	3. Physiological changes (e.g. lung function)
4. Respiratory & cardiovascular hospital admissions	4. Chronic changes in physiologic functions
5. Days of restricted activity	5. Chronic cardiovascular diseases
6. Work absenteeism	6. Intrauterine growth restrictions (low birth weight at term, intrauterine growth retardation, small for gestational age)
7. School absenteeism	7. Mortality due to cardiovascular & respiratory diseases
8. Daily mortality/deaths	8. Lung cancers

Prominent causes of Ambient Air Pollution in the state:

1. Pollution by Automobiles
2. Industrial Emission
3. Open Waste Burning
4. Construction and Demolition Activities
5. Use of Wood as a fuel (main domestic Source)

Prominent causes of Household Air Pollution in the state:

1. Use of biomass, kerosene as fuel for cooking
2. Burning of waste, cow dung, coal
3. Paint/varnishes made on walls and furniture

4. Aerosols/ propellent in the form of spray of insecticides

Other factor contributing to increase/ decrease of air pollution in the polluted cities in the state: Re-suspension of road dust due to traffic burden and poor maintenance in almost all the cities.

Air Quality Index: Air Quality Index is a tool for effective communication of air quality status to people in terms, which are easy to understand. It transforms complex air quality data of various pollutants into a single number (index value), nomenclature and colour.

Air Quality Index (AQI) Category	
Good	0-50
Satisfactory	51-100
Moderately Poor	101-200
Poor	200-300
Very Poor	300- 400
Severe	401-500

Number of AQI monitoring stations within state:

1. By Central Pollution Control Board (CPCB) –2
2. BY State Pollution Control Board (SPCB)- 3

Action points in accordance with Air Quality Index (Annexure)

Ambient Air Quality Data for year 2021 (Garhwal and Kumaon Region) (Annexure)

HEALTH ADAPTATION PLAN

The Vision, Goal and Objectives of the Health Adaptation Plan on Air Pollution and Health under the NPCCHH programme are mentioned below:

Vision: A resilient health system that promotes health and protects against health impacts due to air pollution for all Indian citizens, especially the vulnerable, which include children, women, elderly and marginalised populations, etc.

Goal: To reduce morbidity, mortality, health vulnerability due to air pollution

Objective: To develop a comprehensive response of the health system for prevention and control of health impacts due to air pollution

Specific Objectives:

1. To create awareness on health impacts due to air pollution among the general population, vulnerable communities, health-care providers, and policymakers
2. To strengthen the capacity of the health system (infrastructure, training, guidelines, SOP etc.) to respond to health crisis/ emergencies due to air pollution
3. To provide situational analysis to strengthen preparedness and response at national / state/ district/ below district levels to cope with adverse health impacts due to air pollution
4. To assist states to assess health vulnerabilities due to air pollution and accordingly, build capacities to adapt and mitigate the risk and vulnerabilities
5. To develop partnerships with other related stakeholders in the government and non-government sectors, including civil society, and creating synergy to ensure that health-related issues are adequately represented in policies in the country
6. To strengthen supervision, monitoring, surveillance mechanism of the programme related activities
7. To develop research capacity at the state level to understand linkages of air pollution and health outcomes and develop a mechanism to fill the gap in the evidence-based health policy

Health Sector Adaptation plan for Air Pollution Control

Key components of Health adaptation plan of ARI:

a. **IEC and awareness generation**
b. **Capacity building**
c. **Surveillance**
d. **Inter-departmental coordination**

1.AWARENESS GENERATION

Public Health Advisories on Air pollution related health impacts and issues

Public health advisories issued by Central Govt. are being circulated to all the districts through the state for public dissemination and to alert the population of the potentially harmful impact of air pollution. Districts are ensuring timely dissemination of health advisories to the block and health facility level.

National Guidelines are available on NCDC website:

1. **Public Health Advisory on Air Pollution and Health (2021 Revised) : https://ncdc.gov.in/showfile.php?lid=632**
2. **Health Adaptation Plan For Diseases Due To Air Pollution - https://ncdc.gov.in/WriteReadData/linkimages/HealthAdaptationPlanforDiseaseDuetoAirPollutions.pdf**
3. **Health Sector Preparedness for Air Pollution** https://ncdc.gov.in/WriteReadData/linkimages/HealthSectorPreparednessforAirPollution.pdf
4. **Handbook for Health Professionals on Air Pollutions & Its Impact on Health**

https://ncdc.gov.in/WriteReadData/linkimages/HandbookforHealthProfessionalsonAirPollutions&ItsImpactonHealth.pdf

IEC Campaign

IEC is a very effective tool of raising awareness among community and vulnerable populations. The following activities can be undertaken for raising awareness in community and vulnerable populations-

- Mass campaign using print IEC and electronic messages (audio/ audio-visual).
- Advocacy and public awareness through street plays, folk methods, wall paintings, hoardings etc.
- Social mobilisation (women's self-help groups, community leaders, NGOs, school children) for adaptive measures for health impacts due to air pollution.

Considerations for IEC tool development on air pollution and health

Air pollution is recognised as greatest environmental and avoidable risk factor for human health and found to be associated with health problems, deaths, disabilities and reduced life expectancy. Hence, following considerations for IEC tool development on air pollution and health are recommended:

- More vulnerable populations (children, women, elderly, underlying medical conditions etc.)
- More vulnerable cities or areas of exposures, months, diurnal variations of air pollutions
- Air quality, AQI and its alerts and associated health advisories
- Promotion of activities related to reduction of air pollution – Use of public transport, avoiding biomass burning, use of cleaner fuel for cooking, avoid firecrackers, crop and waste burning etc
- Prevention of risk factor for illnesses like cardio-pulmonary diseases – promotion of healthy diet, physical activity, no use of tobacco and alcohol
- Other health adaptive measures to air pollution
- Do's and Don'ts as shared in the IEC developed under the NPCCHH

Various IEC materials i.e. Posters, Pamphlets, Audio & Video messages are available at NCDC website: https://ncdc.gov.in/index1.php?lang=1&level=2&sublinkid=887&lid=430

IEC DISSEMINATION PLAN

SL. no	*IEC Content*	*Activity*	*Dissemination Plan for 5 years*	*Timeline*	*Budget (in lakhs) for 5 years*				
					22 to 23	*23 to 24*	*24 to 25*	*25 to 26*	*26 to 27*
1.	Pamphlet, poster, banner, Newspaper ad, Folk activities, School quiz/essay competition, Voice message/OB	a. Development of IEC tools and printing b. Hiring of agency for folk activities	*2 Posters for Healthcare facilities in all districts*	***August** to September*	*40.0*	*40.0*	*40.0*	*40.0*	*40.0*
2.			*Social Media (Facebook, Instagram, Twitter etc.)*						
3.									
4.		a. Dissemination of IEC materials b. Folk activities (Nukkad Nataks)		*October To February*					
5.			*1 in all the Healthcare facilities*						

	D calls etc.								

Observation of Special Days

International Day on Clean Air for Blue Sikes will be observed pan state on the particular theme for the year.

Special Day	Date	Key planned activities
International Day on Clean Air for Blue Sikes	7th of September	District and sub-districts levels are recommended to arrange community engagement activities as: • Health facility based: plantation, awareness sessions • Community setting based: mass meetings, rallies, local/community radio programmes, street plays. • Sports events: athletics, cycling • Competition and quiz

2.Capacity Building

Capacity building efforts include developing the technical skills and institutional capability in developing countries and economies in transition to enable them to participate in all aspects of adaptation to, mitigation of, and research on climate change. Trainings, workshops, and meetings are very important to sensitise and update target groups on air pollution and its health impacts and various health adaptation mechanisms.
Some of the priority groups/human resource working in health sector and other departments are targeted to be trained on the health problems of air pollution, such as:

- District nodal officers-CC
- Designated nodal officers related to surveillance in the context of air pollution
- Medical Officers
- Other health professionals like nursing officers, pharmacists, and community health care workers such as ANMs, ASHAs, MPWs, etc.
- Human resource from other departments like Panchayati Raj Institution

Air Pollution Training Modules are available on NCDC, GoI website:

Module	Web link
Training Module for Health Professionals	https://ncdc.gov.in/WriteReadData/linkimages/HandbookforHealthProfessionalsonAirPollutions&ItsImpactonHealth.pdf
Women Training Manual (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/WomenTrainingManualHindi.pdf
Women Training Manual (English)	https://ncdc.gov.in/WriteReadData/linkimages/WomenTrainingManualEnglish.pdf
Women Flipchart	https://ncdc.gov.in/WriteReadData/linkimages/WomenFlipchartHindi.pdf

(Hindi)	
Women Flipchart (English)	https://ncdc.gov.in/WriteReadData/linkimages/WomenFlipchartEnglish.pdf
Children Training Manual (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenTrainingManualHindi.pdf
Children Training Manual (English)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenTrainingManualEnglish.pdf
Children Flipchart (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenFlipchartHindi.pdf
Children Flipchart (English)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenFlipchartEnglish.pdf
Traffic Police Training Manual Hindi	https://ncdc.gov.in/WriteReadData/linkimages/IEC/TrafficPoliceTrainingManualHindi.pdf
Traffic Police Training Manual English	https://ncdc.gov.in/WriteReadData/linkimages/IEC/TrafficPoliceTrainingManualEnglish.pdf
Municipal Worker Training Manual Hindi	https://ncdc.gov.in/WriteReadData/linkimages/IEC/MunicipalWorkerTrainingManualHindi.pdf
Municipal Worker Training Manual English	https://ncdc.gov.in/WriteReadData/linkimages/IEC/MunicipalWorkerTrainingManualEnglish.pdf

Training / Sensitization Workshop Plan For 5 Years (2022-27)

Sensitization Workshop

S. No.	Sensitization Workshop	No. of Workshops	Timeline	Budget (in lakhs) for 5 years				
				2022-23	2023-24	2024-25	2025-26	2026-27
01	District Nodal Officers-CC	1 (State level)	September	2.00	2.00	Budget will be calculated as per requirement (with 15% increase at least)		
02	Nodal Officer-ARI Surveillance							

Trainings

S. No	Training	No. of Batches	Timeline	Budget (in lakhs) for 5 years

				2022 – 23	2023 – 24	2024 – 25	2025 – 26	2026 – 27
01	Doctors and Medical Officers	13 (1 batch per district)	October-November	5.85	5.85	Budget will be calculated as per no. of batches (with 15% increase at least)		
02	Health care workers	26 (2 batches per district)	October-December	10.49	10.49	Budget will be calculated as per no. of batches (with 15% increase at least)		
03	Human resource from PRI	13 (1 batch per district)	October-December	3.43	3.43	Budget will be calculated as per no. of batches (with 15% increase at least)		

3.Surveillance on Acute Respiratory Illness (ARI) in context of Air Pollution

The objective of ARI surveillance is to identify the trend of air pollution related illness in context of the outdoor air quality at an area and its report is shared to all relevant authorities including public health authorities to minimize the impact of the air pollution through timely appropriate intervention measures.

Based on the National guidelines, following 6 sentinel hospitals have been identified in Uttarakhand state for ARI surveillance in context to air pollution:

City wise List of Sentinel hospitals identified for ARI surveillance activity

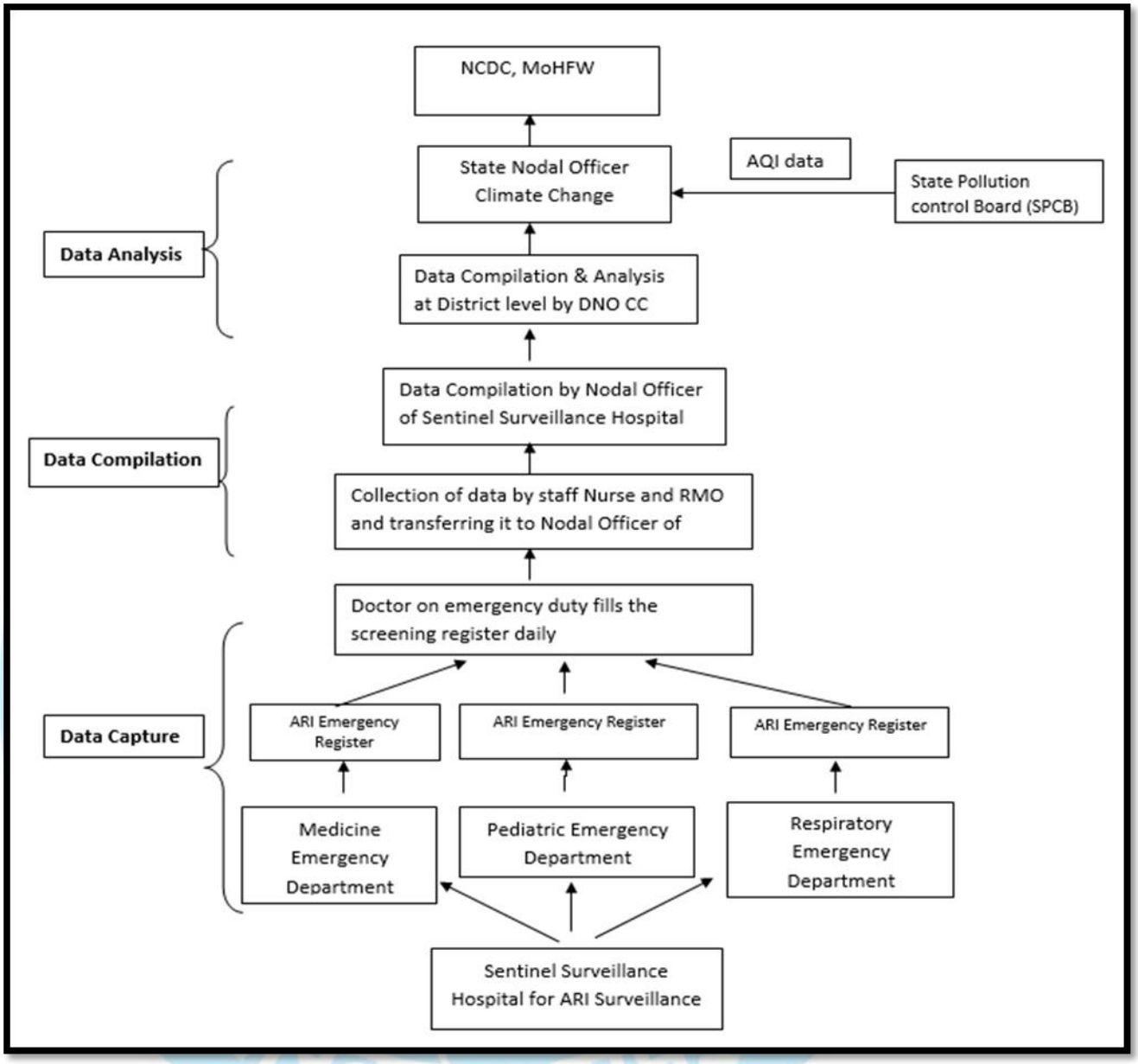
Name of District	Name of City	Name of Hospital	Public or Private
Dehradun	Dehradun	Govt. Doon Medical College	Public
	Rishikesh	Sub District Hospital Rishikesh	Public
Haridwar	Haridwar	District Hospital	Public
Udham Singh Nagar	Rudrapur	District Hospital	Public
	Kashipur	Sub District Hospital Kashipur	Public
Nainital	Haldwani	Govt. Medical College Haldwani	Public

Reporting Mechanism:

- Sentinel hospital to collect daily data of respiratory emergencies for 24 hours and report against total attendance of patients in the emergency department for the corresponding day.
- Nodal officer of sentinel hospital to send the report to the nodal officer at district level.

- District nodal officer – climate change to collect and collate data of sentinel hospitals. DNO-CC must take the AQI level for the corresponding day.
- Similarly, data must be collated and analysed at the state level against the AQI levels.
- A monthly report and the collected data to be sent to the NCDC before the specified date

ARI Surveillance at State - Data Flowchart



Timely issuance of alerts/ warnings on health risk factors related to the air quality level (AQI) and weather conditions like temperature, humidity etc. obtained from IMD/ Pollution Control Boards to the health professionals and the people

To coordinate with other sectors like India Meteorological Department, SAFAR, Pollution Control Boards in an area for information on the air quality level and weather conditions like AQI level, temperature, humidity, wind speed and direction in an area which are likely to increase the health issues among the more vulnerable groups
of people. The health risk factors information may be conveyed in advance as an alert or early warning information as forecasted by the concerned departments.

4.Inter-departmental coordination

The inter-departmental coordination at the state and district level is very crucial to develop state or district level health adaptation plans. The multisectoral task force may be engaged for developing HAP related to air pollution and health:

a. **Forest Department/State Climate Change Centre:** For mitigation action information, including revised plans and actions related to air pollution

b. **Pollution Control Board:** CPCB/ SPCB/ District PCB for the air quality information or AQI in the city/ area and its forecast.

c. **IMD:** Information from India Meteorological Department/ SAFAR related to AQI forecasting or timely warning of weather, temperature, humidity, wind direction, and speed, etc.

d. **Agriculture:** Actions and measures to reduce stubble burning, which is considered to aggravate air pollution during certain seasons; alteration in cropping pattern to reduce pollutant count in an area etc.

e. **Other National Health Programmes -** like NPCDCS etc. which also address health issues related to air pollution

g. **Women and Child Development Department:** Advocate through Self-help groups (SHGs) and Mahila Mandals to protect the health of the women and children from significant exposure to smoke from biomass while inside the house. Awareness-raising can be done to improve household ventilation to reduce smoke inhalation from lighting (ex. kerosene) or to cook fuels.

h. **Transport department-** ensure effective implementation of the New Motor Vehicles Act (once approved) and to ensure proper engine checks for vehicles to assess pollution levels

i. **Panchayati Raj-** to involve creating enabling conditions to facilitate community participation like those SHGs

j. **Academic Institutes/Medical Colleges** capacity building, operational and community- based research related to air pollution and related health intervention areas.

Roles and responsibilities:

State Climate Change & Human Health Cell:

1. To coordinate with the state level task force meetings to develop a HAP on air pollution and health as part of the State Action Plan on Climate Change and Human Health (SAPCCHH)
2. To undertake situational analysis of health impacts in the context of air pollution in the State
3. Identification and capacity building of human resources like DNO-CC, Nodal officer-ARI surveillance and others
4. IEC development, translation, and dissemination planning
5. Development and dissemination of health advisories
6. Surveillance establishment in the context of air pollution
7. Hospital preparedness related to air pollution diseases
8. Timely issue of warnings to hotspot areas, health professionals, and vulnerable and general population
9. Overall periodic reviews, supervision, Monitoring and evaluation of the identified activities being carried out at all levels – State, Districts, Blocks, and Villages/wards

District Climate Change & Human Health Cell:

1. To coordinate with the district level task force meetings to develop a HAP on air pollution and health as part of the District Action Plan on Climate Change and Human Health (SAPCCHH)
2. To undertake situational analysis of health impacts in the context of air pollution in the district
3. Identification and capacity building of human resources like Nodal officer-ARI surveillance, Medical Officers, Communities health officers, health care workers, and other departments like PRI, WCD etc.
4. IEC development, translation, and dissemination planning
5. Development and dissemination of health advisories
6. Surveillance and reporting in the context of air pollution to the state level
7. Hospital preparedness related to air pollution diseases
8. Timely issue of warnings to hotspot areas, health professionals and vulnerable and general population
9. Overall periodic reviews, supervision, Monitoring and evaluation of the identified activities being carried out at all levels districts, blocks, and villages/wards.

Block level CHC/PHC:

1. Implementation of the identified activities on air pollution and health as per DAPCCHH
2. Capacity Building of Medical officers, Nursing officers, Pharmacists, Communities health officers, health care workers and other departments like PRI, WCD, etc.
3. Integrate and coordinate to get support from Rashtriya Bal Swasthya Karyakram, and Rashtriya Kishore Swasthya Karyakram
4. IEC Dissemination for increasing awareness generation to public and officials
5. Health advisories dissemination and implementation
6. Hospital preparedness for public health emergencies related to air pollution
7. Supervision and monitoring of Surveillance activities if any sentinel hospitals are involved in the block area

Medical officer at the Primary Health Centre/ Urban Healthcare Centre level:

The medical officer is responsible for implementing Comprehensive Primary Healthcare Services through a network of Health and Wellness Centres that are envisaged in the Ayushman Bharat to provide promotive, preventive, and curative services etc. near the community through active participation of the whole team through the following actions:

1. Creating awareness at the healthcare facilities and at the community level
2. Capacity building, developing village level health adaptation plan related to air pollution
3. Management of outdoor cases of health problems, emergency services, and their referrals for cases in the context of air pollution

Community Health workers at the Village Level/ Ward Level-

- Village Health Sanitation Nutrition Committee in Rural areas
- MAS (Mahila Arogya Samiti) in Urban wards
- Community level public awareness generation on health effects of air pollution, and ways to protect and prevent health problems

1. **ASHAs** are community-level health workers acting as important link between the community and the healthcare system. With their community outreach activities, the following may be done-
   a. Awareness generation at the community level on the sources of air pollution, health problems and ways to protect and prevent air pollution
   b. Organise campaigns particularly on health problems of women and children related to air pollution
2. **AWWs** – (Through CDPO): At the Anganwadi centres during immunisation sessions, information may be given on the sources of air pollution in the household and outside, its health problems, particularly on women and children and ways to address them.

Chapter 8 - Health Adaptation Plan for Heat-related illness

Heat-related illnesses (HRI) encompass a spectrum of disorders from heat syncope, muscle cramps, and heat exhaustion to a life-threatening emergency such as heat stroke. These illnesses arise when there is a disruption in the regulation of the body's temperature because heat input from the environment and body metabolism is increased compared without put from the skin via radiation, evaporation, and convection.

In India, a heat wave is considered if the maximum temperature of a station reaches at least 40°C or more for plains, 37°C or more for coastal stations and at least 30°C or more for hilly regions. Following criteria are used to declare a heat wave:

a) Based on Departure from Normal

o *Heat Wave:* Departure from the normal is 4.5°C to 6.4°C

o *Severe Heat Wave:* Departure from the normal is >6.4°C

b) Based on the Actual Maximum Temperature (for plains only)

o *Heat Wave:* When the actual maximum temperature ≥ 45°C

o *Severe Heat Wave:* When the actual maximum temperature ≥47°C

To declare a heat wave, the above criteria should be met in at least at two stations in a Meteorological sub-division for at least two consecutive days. A heat wave will be declared on the second day.

Different types of heat-related illness includes:

1. Minor heat related Illnesses: Heat rash, heat cramps, heat syncope

2. Major heat related Illnesses: Heat Exhaustion and heat Stroke

Types of heat-related illnesses

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal / Important Signs	Pertinent Negative findings
Heat rash/ prickly heat/ Miliaria	All, but frequently children	Hot environment; +/- insulating clothing or swaddling (wrap in tight clothes)	**ITCHY RASH** with **SMALL RED BUMPS** at pores in the skin. Seen in setting of heat exposure; bumps can sometimes be filled with clear or white fluid	**DIFFUSED RED COLOUR SKIN OR VESICULAR RASH**, itching of the skin without visible eruption	**NOT FOCALLY DISTRIBUTED** like a contact dermatitis
Heat cramps	All	Hot environment, **TYPICALLY WITH EXERTION**, +/- insulating clothing	**PAINFUL SPASMS** of large and frequently used muscle groups	Uncomfortable appearance, may have **DIFFICULTY FULLY EXTENDING AFFECTED LIMBS/JOINTS**	No contaminated wounds/tetanus exposure; no seizure activity
Heat exhaustion	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling overheated, light headedness, **EXHAUSTED AND WEAK**, unsteady, feeling of **VOMITING, SWEATY AND THIRSTY**, inability to continue activities	**SWEATY**/diaphoretic; flushed skin; hot skin; **NORMAL CORE TEMPERATURE**; +/- dazed, +/- generalized weakness, slight disorientation	No coincidental signs and symptoms of infection; no focal weakness; no difficulty in swallowing food or speech; no overdose history
Heat syncope	Typically adults	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling hot and weak; light headedness followed by a **BRIEF LOSS OF CONSCIOUSNESS**	Brief, generalized loss of consciousness in hot setting, short period of disorientation, if any	**NO SEIZURE ACTIVITY**, no loss of bowel or bladder continence, no focal weakness, no difficulties in food swallowing or speech
Heat stroke	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Severe overheating; profound weakness; **DISORIENTATION, NOT FULLY ALERT, CONVULSION, OR OTHER ALTERED MENTAL STATUS**	Flushed, **DRY SKIN** (not always), **CORE TEMP ≥40°C OR 104°F**; altered mental status with disorientation, incoherent behaviour, **COMA, CONVULSION**; tachycardia; +/- hypotension	No coincidental signs and symptoms of infection; no focal weakness; no difficulties in swallowing food or speech, no overdose history

The adverse health effects of hot weather and heat-waves are largely preventable. Prevention requires a portfolio of actions at different levels, these actions can be integrated in a defined heat–health action plan.

National Action Plan on Heat related illnesses is available at NCDC website -
https://ncdc.gov.in/WriteReadData/linkimages/NationActionplanonHeatRelatedIllnesses.pdf

Public Health Advisory: Extreme Heat/Heatwave is available at NCDC website -

https://ncdc.gov.in/showfile.php?lid=847

Roles and responsibilities during heat wave of health department, medical colleges & hospitals, health centres, and link workers and other department's is annexed

Key components of health adaptation plan for Heat related illnesses:

1. Awareness generation
2. Capacity building
3. Surveillance of HRI and SOPs
4. Inter-departmental coordination

Awareness Generation

Under the programme, awareness generation among all the relevant stakeholders including the common population, vulnerable communities, healthcare providers, and policymakers around the impacts of heat related illnesses along with the ways to address the same is imperative. Thereby, under the programme, Uttarakhand state will conduct the following key activities

a. IEC Campaign

The districts are aimed to create awareness by Information Education and Communication Activities (IEC) through the development of locally and culturally more acceptable messages in posters, audio, video, organising public health events, and issuing advisories related to increasing heat.

The content for the IEC for the heat related issues will be provided by the National and State NPCCHH division. The districts is to utilize these materials and disseminate at all levels.

Various IEC materials are available at NCDC website:

1. https://ncdc.gov.in/index1.php?lang=1&level=3&sublinkid=1089&lid=848
2. https://ncdc.gov.in/index1.php?lang=1&level=3&sublinkid=1091&lid=556
3. https://ncdc.gov.in/showfile.php?lid=353

IEC DISSEMINATION PLAN

SL. NO	*IEC CONTENT*	*ACTIVITY*	*DISSEMINATION PLAN FOR 5 YEARS*	*TIMELINE*	*BUDGET (IN LAKHS) FOR 5 YEARS*				
					22 to 23	*23 to 24*	*24 to 25*	*25 to 26*	*26 to 27*
1.	Pamphlet, poster, banner, Newspaper	a. Development of IEC tools and printing b. Hiring of agency	*2 Posters for Healthcare facilities in all districts*	***February to March***					

2.	ad, Folk activities, School quiz/essay competition, Voice message/OBD calls etc.	for folk activities	*Social Media (Facebook, Instagram, Twitter etc.)*		*40.0*	*40.0*	*40.0*	*40.0*	*40.0*
3.									
4.		a. Dissemination of IEC materials b.Folk activities (Nukkad Nataks)		***April to July***					
5.			*1 in all the Healthcare facilities*						

b. Public Health Advisories

Health advisories are issued to alert population of potential harmful impact of increasing heat. Advisories are issued at central level and forwarded to the districts through the state for public dissemination. District should ensure timely dissemination of health advisories.

2.Capacity Building:

Capacity building of Doctors, Paramedical staff, health care workers and other human resources is very essential for prevention and management of Heat related illnesses. Some of priority human resource working in health sector and other departments are targeted to be trained on the HRI, such as:

- District Nodal Officers-CC
- Doctors and Medical Officers
- Other health professionals like nursing officers, pharmacists, and community health care workers such as ANMs, ASHAs, MPWs etc.
- Human resource from other departments like Panchayati Raj Institution, WECD etc.

Training Plan at District level

Training	Trainer	Participants	Training Content
Medical Officers	DNO-CC	MO (DH,CHC,PHC)	Prevention and control of Heat related illness
Health Care Workers	MO	Community Health Workers (ANM, MPHW, CHO, ASHA)	
Panchayati Raj Institutions	MO, CHO	Panchayati Raj Institutions, communities	

Training / Sensitization Workshops and budget are merged with as per training plan given in chapter 7. The trainings will be provided on all climate sensitive issues like Air pollution related health impacts, Heat related illnesses, Vector borne diseases and other state specific issues. No separate budget identified specifically for Heat related trainings.

Sensitization/knowledge building workshops will be planned for seeking updates on various heat related health issues between district officials, medical officers and academic institutions working on climate change impact.

2 batches of Virtual trainings for re-orientation and sensitization of DNO-CC and MOs will be organized by state level in February.

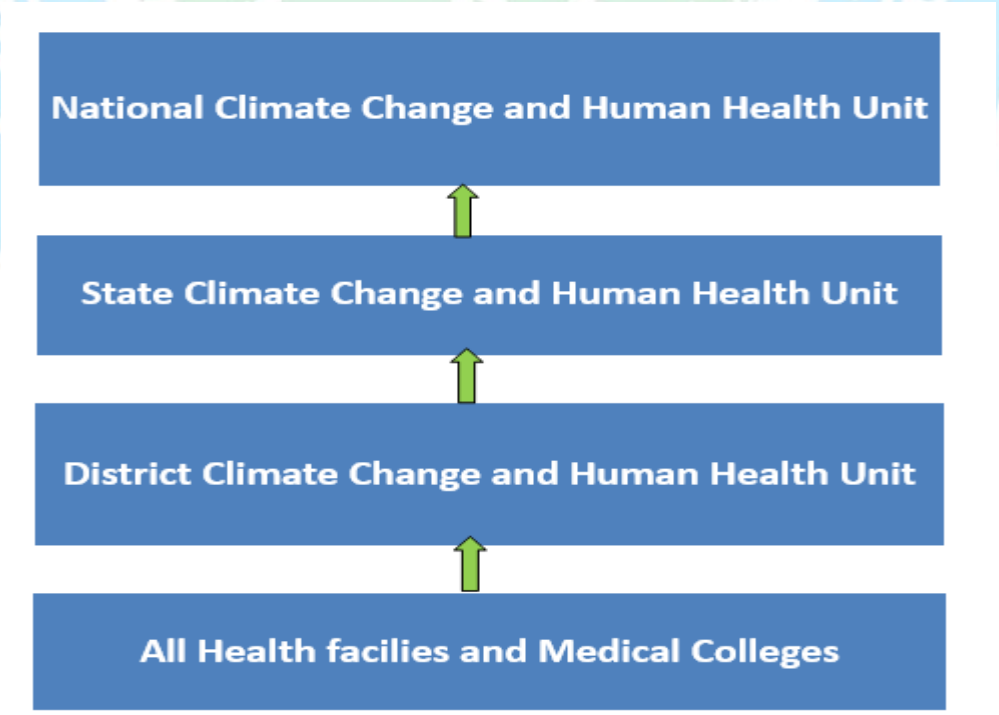
3.Surveillance:

The Heat Related Illnesses (HRI) surveillance was started in year 2015. The Integrated Disease Surveillance Programme (IDSP) was conducting the surveillance at central, state and district level. Since year 2020 the National Programme on Climate Change and Human Health (NPCCHH) has started the HRI surveillance. The HRI surveillance is being continuously done in the state of Uttarakhand. All districts are consistently reporting on the standard formats provided by GoI.

The NPCCHH division has developed standard formats (annexed) for surveillance and reporting from different levels i.e. health facility level, district level, and state level:

1. Format 1 (A): Health Facility format
2. Format 1 (B): Health Facility Format
3. Format 2: Health Facility Format For Sending To District
4. Format 3 (A): District Format For Daily Compilation
5. Format 3 (B): District Format For Sending To State
6. Format 4 (A): State Format For Daily Compilation (District Wise)
7. Format 4 (B): State Format For Daily Compilation (Day Wise)
8. Format for Investigation of Suspected Heat Related Illness Death

Reporting Flow and mechanism



4. Inter-departmental coordination

The Inter-departmental coordination at the state and district level is very crucial to develop state or district level health adaptation plans. The multisectoral task force and following departments may be engaged for developing HAP for Heat related illnesses:

a) Forest Department/State Climate Change Centre
b) IMD
c) Women and Child Development Department
d) Panchayati Raj
e) Academic Institutes/Medical Colleges

Roles and responsibilities

State Climate Change & Human Health Cell

1. Prepare advisory and disseminate to district level
2. Coordinate with multisectoral task force members in developing State Action plan for Heat-related illnesses
3. Capacity building of DNO-CC and MOs
4. HRI Surveillance establishment
5. IEC and awareness generation & dissemination planning
6. Monitoring and supervision of activities planned at district & block level
7. Support in hospital level preparedness

District Climate Change & Human Health Cell

1. Disseminate advisory received from state level to block and health facility level
2. Coordinate with multisectoral task force members in developing District Action plan for Heat-related illnesses.
3. Capacity building of MOs, paramedical staff, health care workers, CHOs, and other departments
4. HRI Surveillance establishment and daily reporting
5. IEC and awareness generation & dissemination planning
6. Monitoring and supervision of activities planned at district, block & health facility level
7. Support in hospital level preparedness

Block level

1. Disseminate advisory received from district level to health facility level
2. Capacity building of MOs, paramedical staff, Health care workers, CHOs and other departments
3. HRI daily reporting
4. IEC and awareness generation & dissemination
5. Hospital level preparedness

Health Facility level

1. HRI daily reporting

2. IEC and awareness generation & dissemination
3. Hospital level preparedness

Frontline Health Care Worker

1. HRI surveillance
2. Generate awareness among community
3. Timely referral of suspected cases to nearest health facility

Chapter 9 - Health Adaptation Plan for Vector-Borne diseases

Effect of variation in climate has been well established for illnesses which are spread through vectors or which are transmitted from animals to humans. The National Vector Borne Disease Control Programme (NVBDCP) is looking after the prevention and control of vector-borne diseases in the state. In Uttarakhand, dengue, malaria and Japanese Encephalitis are major public health challenges. Weather variations like changes in temperature, rainfall, humidity, floods, etc., change in demography, population movement, migration etc. and water storage practices, agricultural practices, etc. are major concerns for transmission of VBDs. The plain districts i.e. Dehradun, Haridwar, Nainital, and U.S.Nagar are more vulnerable to the VBDs in comparison to other hilly districts.

Status of Vector-Borne diseases in the state:

Year	Malaria		Dengue		JE		Kala-Azar		Chikungunya		Filaria	
	Cases	Death	Cases	Death	Cases	Death	Cases	Death	Cases	Death	Cases	Death
2017	508	0	849	0	0	0	2	0	0	0	0	0
2018	409	0	591	2	22	1	0	0	11	0	0	0
2019	296	0	10622	8	9	0	0	0	1	0	0	0
2020	15	0	76	1	4	2	0	0	0	0	0	0
2021	13	0	738	2	1	0	0	0	1	0	0	0

Key activities under taken for the prevention and control of VBDs in the state:

- Dengue and malaria are notifiable disease in Uttarakhand state.
- Strengthening diagnostic capacities.
- Capacity building of health care workers.
- Case based surveillance through trained RRTs.
- Mass awareness generation.
- Robust inter-sectoral collaboration and activities.

Mechanism of Generation of Alert system for the outbreak of Vector Borne diseases.

- Integration and coordination with IDSP and NVBDCP
- Disease Surveillance
- Monitoring and supervision
- Media alert and verification

I. AWARENESS GENERATION

- To increase the general awareness amongst all the relevant stakeholders including people especially vulnerable communities, healthcare providers and policy makers regarding the impacts of vector borne disease and ways to address them.
- The districts are aimed to create awareness through Information Education and Communication Activities (IEC) through the development of locally and culturally more acceptable messages in posters, audio, video, organising public health events, and issuing advisories related to vector-borne diseases.
- The content for the IEC for vector borne disease will be provided by the state NPCCHH division. The state will translate the content into the regional language, if required and the role of the districts is to utilize these materials and disseminate at all levels.
- Advertisement and promotion through IEC: Street plays , Hoards, billboards, as and other advertisement modes

Observance of important environment-health days

Observance of following days may be recommended for awareness on climate change and vector-borne diseases.

Day	Activities on VBD in context of climate change
• World Malaria Day (April 25) • World Mosquito Day (August 20) • World Environmental Health Day (September 26)	IEC Campaigns • Audio-video spots broadcasting • Targeted awareness sessions: urban slums, schools, women, children • Street plays and local cultural activities, Rallies • Sports events • Competition: poster, poem/essay, quiz Collaborate with NVBDCP

II. CAPACITY BUILDING

To strengthen the capacity of healthcare system to adapt/address illnesses/ diseases due to vector-borne diseases.

Training Plan at District level

Training	Trainer	Participants	Training Content
Medical Officers	DNO-CC	MO (DH,CHC,PHC)	Prevention and control of Vector borne diseases
Health Care Workers	MO	Community Health Workers (ANM, MPHW, CHO, ASHA)	
Panchayati Raj Institutions	MO, CHO	Panchayati Raj Institutions, communities	

Training / Sensitization Workshops and budget are merged with as per training plan given in chapter 7. The trainings will be provided on all climate sensitive issues like Air pollution related health impacts, Heat related illnesses, Vector borne diseases and other state specific issues. No separate budget identified specifically for Vector borne diseases.

Annual training plan for vector-borne diseases in context of climate change under NPCCHH, Uttarakhand

Training Programme for	Trainer	Topics
District level (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	- Role of climate change impact in VBD burden, prevention measures - Tracking of VBD and Integrating rainfall, humidity and temperature parameters with VBD surveillance - Post-disaster VBD surveillance, prevention, management
Health facility level (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	- Role of climate change impact in VBD burden, prevention measures - Strengthen surveillance reporting - Post-disaster VBD surveillance, prevention, management in community and at relief camps
Community Health care workers (MPH, ASHA, ANM etc)	District Level Trainers, MO	- Role of climate change impact in VBD burden, prevention measures - Post-disaster VBD surveillance, prevention, management in community and at relief camps
Panchayati Raj Institutions	District level trainers, MO,	- Role of climate change impact in VBD burden, prevention measures

	Health care workers	

Roles and responsibilities

State Climate Change & Human Health Cell

1. Prepare advisory and disseminate to district level.
2. Coordinate with other National health programmes like IDSP & NVBDCP for surveillance activities.
3. Coordinate with multisectoral task force members in developing State Action plan for Vector borne diseases.
4. Capacity building of DNO-CC and MOs in coordination with IDSP & NVBDCP.
5. IEC and awareness generation & dissemination planning in coordination with IDSP & NVBDCP.

District Climate Change & Human Health Cell

1. Disseminate advisory received from state level to block and health facility level
2. Coordinate with other National health programmes at district level like IDSP & NVBDCP for surveillance activities.
3. Coordinate with multisectoral task force members in developing State Action plan for Vector borne diseases.
4. Capacity building of MOs, LTs and other staff in coordination with IDSP & NVBDCP.
5. IEC and awareness generation & dissemination planning in coordination with IDSP & NVBDCP.

Block level

1. Disseminate advisory received from district level to health facility level
2. Capacity building of MOs, paramedical staff, Health care workers, CHOs and other departments.
3. Surveillance and Reporting.
4. IEC and awareness generation.

Health Facility level

1. Reporting of VBDs.
2. IEC and awareness generation.

3. Capacity building of frontline health care workers.
4. Hospital level preparedness.

Frontline Health Care Worker

1. Generate awareness among community.
2. Reporting and timely referral of suspected cases to nearest health facility.

Chapter 10 - Health Adaptation Plan for Disaster and Extreme Weather Events

Raised morbidity and mortality may be reported due to the effect of extreme weather conditions viz frequent and severe episodes of heat waves, floods, droughts, and fires as a direct impact of climate variability and affecting population at large.

Climate change can result in more hot days, resulting in more periods of 'drought', 'dust storms', or 'heavy rains (precipitation)', and even 'flooding'. The health gets directly affected due to injuries, hypothermia, hyperthermia, drowning, and indirectly through population dislocation, crowding, poor living conditions, faeco-oral transmission of gastro-intestinal pathogens causing water and food borne illnesses, respiratory illness and other infectious diseases (e.g., leptospirosis, vector-borne disease, cholera and also mental illnesses). The reason primarily is due to contamination of water and sewage disposal.

Uttarakhand is prone to severe earthquakes and landslides. In addition, the state is also affected by disaster like floods, epidemics, fire, hailstorm, lightening, road accidents, etc. It is highly vulnerable to multihazards viz. earthquake, landslides, flash-floods, avalanches, dam bursts, and droughts, but particularly earthquakes, Uttarakhand lies in the highest seismic risk zones of the country i.e. Zone V and IV.

In the disaster risk map of the country, Uttarakhand has attained its position among first five states in respect of natural hazards, i.e., earthquakes, flash floods triggered by cloud burst, landslides, avalanches, and forest fires and frequent droughts in summers. These disasters have caused immense loss of property, natural wealth, and human lives. With the growth of population and infrastructure, state's seismic vulnerability has increased and previous earthquakes have provided a glimpse of the devastating potential of seismic tremors. On the basis of damage caused due to disasters and their widespread nature, this state can be called one of the most disaster prone states of the country.

Health facilities and services are often affected in the event of disasters. In such a situation, protective measures such as activities related to pre, during and post disaster are must to be updated. This can reduce the effects/losses caused by the disaster and can help in taking quick actions during the incident.

Impact of Disaster in Uttarakhand 2013

- The disaster caused heavy loss of precious lives and extensive damage to private properties and public infrastructure
- More than nine million people were affected by the flash floods
- The five districts namely, Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi were the worst affected
- The highest number of people reported missing were largely from Uttar Pradesh followed by Uttarakhand and Madhya Pradesh, accounting for more than half of the total number of people reported missing*

*http://nidm.gov.in/PDF/pubs/India%20Disaster%20Report%202013.pdf

The Health department is closely working with the State Disaster Management Authority for preparedness, mitigation, response and recovery from disaster. The Standard Operating Procedures (SOP) of the Health department is made and inbuilt under State Disaster Management Plan.

Link for Health Department SOP for Disaster Management-
https://usdma.uk.gov.in/health-department-1147.aspx

Link for Uttarakhand state disaster management plan-

https://usdma.uk.gov.in/uttarakhand-state-disaster-management-plan-2020-21-1332.aspx

AWARENESS GENERATION

To increase general awareness amongst all the relevant stakeholders including people especially vulnerable communities, healthcare providers, and policy makers regarding the impacts of extreme weather events and disasters and ways to address them. The districts are aimed to create awareness by Information Education and Communication Activities (IEC) through the development of locally and culturally acceptable messages in posters, audio, video, organising public health events, and issuing advisories related to health impacts of extreme weather events.

Observance of important environment-health days

Day	Activities on Heat-Health
• International Day for Disaster Risk	IEC Campaigns • Audio-video spots broadcasting

Reduction	• Targeted awareness sessions for women, children, occupational groups, etc. • Mock drill, disaster response exercise • Sports events • Competition: poster, poem/essay, quiz Health facility level activities • Health facility-based patient awareness sessions • Conduct assessment of disaster vulnerability/energy/water conservation measures • Review of implementation of climate-resilient measures

CAPACITY BUILDING

To strengthen the capacity of healthcare system to adapt/address illnesses/ diseases due to extreme weather events or disasters.

Training Plan at District level

Training	Trainer	Participants	Training Content
Medical Officers	DNO-CC	MO (DH,CHC,PHC)	Extreme weather events and Disaster Management
Health Care Workers	MO	Community Health Workers (ANM, MPHW, CHO, ASHA)	
Panchayati Raj Institutions	MO, CHO	Panchayati Raj Institutions, communities	

Training / Sensitization Workshops and budget are merged with as per training plan given in chapter 7. The trainings will be provided on all climate sensitive issues. No separate budget identified specifically for extreme weather events. The topics of disaster that will consider for training are mentioned in the table below.

Annual training plan for Extreme Weather Events and Health under NPCCHH, Uttarakhand

Training Programme for	Trainer	Topics
District level **(DNO-CC, trainers)**	State Level Trainers SNO-CC, Consultant	- Climate change and impact of extreme weather events in India - Formation of disaster management committees and plans - Health facility vulnerability, resilient measures and disaster preparedness - Disaster response in coordination with state/district disaster management authority - Post-disaster health impact assessment and response
Health facility level **(MO of DH/CHC/PHC)**	District Level Trainers DNO-CC	- Health facility disaster vulnerability assessment - Disaster management committee and plan - Climate resiliency measures (structural/functional) - Health facility preparedness for EWE/disaster

		response - Post-disaster surveillance and damage assessment
Community Health care workers**(MPH, ASHA, ANM etc)**	District Level Trainers, MO	- Climate change and health impact of extreme weather events - Disaster planning and response
Panchayati Raj Institutions	District level trainers, MO, Health care workers	- Climate change and health impact of extreme weather events - Disaster planning and response with community participation

Strengthening Health Sector Preparedness

i. **Early warning:** Dissemination of early warnings for Heat wave, Cold wave, Floods etc. to health facility **level** and community level.

ii. **Surveillance:**

- Post-disaster health impact assessment:
- Support post-disaster surveillance of communicable disease, health facility affected conducted by SDMA, IDSP or other agencies

iii. **Health Facility Preparedness:**

- Vulnerability assessment of health facility in context of climate change-extreme weather events.
- Identify structural changes/retrofitting measures at the facility level to equip the healthcare facility.
- Formalize health related disaster management plan and committee.
- Emergency procurement arrangements & functioning of essential health services (safe water, immunization, maternal-child care, etc.).
- Post-disaster damage assessment and referral plan in case of health facility damage.
- Ensure routine monitoring and maintenance of support functions (water quality, waste management).

Roles and responsibilities

State Climate Change & Human Health Cell

- Disseminate early warnings to district level
- Finalization of IEC material and dissemination plan
- Formalize intersectoral coordination for disaster planning, management, and response with SDMA/IMD and other response departments
- Organize training of district level officers
- Facilitate disaster vulnerability assessments
- Facilitate assessment and implement of climate resilient measures in health facilities

District Climate Change & Human Health Cell

- Disseminate early warnings to the block level
- Finalization of IEC material and dissemination plan
- Formalize intersectoral coordination for disaster planning, management, and response with DDMA and other response departments
- Organize training of MOs and block level officers
- Facilitate disaster vulnerability assessments
- Assessment and implement of climate resilient measures in health facilities

Block level

- Conduct community level IEC activities
- Ensure training of medical officers
- Organize PRI sensitization workshop and training for vulnerable groups
- Facilitate disaster vulnerability assessments in health facilities

Health Facility level

- Conduct health facility-based IEC activities
- Support community level IEC activities
- Preparation of Disaster Management Plans and hospital safety plan
- Assessment of health facility in context of climate change-extreme weather events
- Identifying structural changes/retrofitting measures at the facility level to equip the healthcare facility
- Ensuring routine monitoring and maintenance of support functions (Water quality, waste management)
- Health facility preparedness for seasonal events

Frontline Health Care Worker

- Generate awareness among community.
- Training of community members for preparedness and response due to disaster/extreme weather events

Chapter 11
NPCCHH: Budget

Budget Head	Activity	FY 2022-23 (Rs in Lakh)	FY 2023-24 (Rs in Lakh)	2024-25	2025-26	2026-27
Others including operating costs (OOC)	Green Measures in Healthcare Facilities: 1. Energy auditing in Healthcare Facilities 2. Replace existing lighting (Non-LED) with LED 3. Installation of Solar Panels 4. Installation of Rainwater Harvesting System	27.40	54.80	Budget will be calculated as per requirement of the State (Will be increased by 15% increase at least)		
Infrastructure - Civil works (I&C)	Climate Resilient Healthcare facilities infrastructure	5.00	10.00			
Capacity building incl. training	1. Trainings of Medical Officers 2. Training of Health Workers 3. Training of PRI	21.16*	19.77			
Surveillance, Research, Review, Evaluation (SRRE)	Surveillance/ Vulnerability assessment/ Research related to Climate Change, Air Pollution and Heat related illness	0.65	0.65			
IEC & Printing	1. IEC on Climate Sensitive Diseases at Block, District and State level – Air pollution, Heat and other relevant Climate Sensitive diseases 2. Printing activities for NPCCHH	82.40*	80.20			
Planning and M&E	1. Task force Meeting to draft health sector plan for Heat and Air Pollution 2. Sensitization workshop/ Meeting of the State Program Officers and District level Health Officers	5.04	5.04			
	Total	**141.65**	**170.46**			

*Including committed amount of FY 2021-22

Cumulative IEC Budget

IEC is a very effective tool of raising awareness among community and vulnerable populations. The following activities can be undertaken for raising awareness in community and vulnerable populations-

- Mass campaign using print IEC and electronic messages (audio/ audio-visual).
- Advocacy and public awareness through street plays, folk methods, wall paintings, hoardings etc.
- Social mobilisation (women's self-help groups, community leaders, NGOs, school children) for adaptive measures for health impacts due to air pollution.

IEC Plan

Level	FY 2022-23 (Rs in Lakh)	FY 2023-24 (Rs in Lakh)	Remarks	FY 2024-25 (Rs in Lakh)	FY 2025-26	FY 2026-27
State level IEC	38.50	38.50	• Rs. 3.00 Lakh for News paper ad for 2 times in a year @Rs 1.5 Lakh per ad • Rs. 17.50 Lakh for Bus que shelter Display for 25 identified sites for 2 months @Rs 35000 per month per site • Budget proposed Rs. 18.00 lakh for Voice Messages/OBD Call for 2 times	Budget will be calculated as per requirement of the State (Will be increased by 15% increase at least)		
District Level IEC	40.40	40.40	• Rs. 26.00 Lakh for Creating awareness through news paper, pamphlet, leaflet, hoardings etc. @Rs 2.00 Lakh per district • Budget proposed Rs. 14.40 lakh for 192 Folk activities / Nukkad Natak in District @ Rs. 7500 per folk activity/ Nukkad Natak			
Total	**78.90**	**78.90**				

Annexures

SAPCCHH: Reporting, Monitoring, & Evaluation

The Monitoring & Evaluation of the implementation of SAPCCH will be done by State Health Department, District Health Officers and the individual health facilities.

Monthly / quarterly progress monitoring for climate sensitive illnesses to be done at all levels, i.e. District to State to Central level. These Monthly / Quarterly Progress Reports should include a collation / aggregation of the data / information compiled in each health care facility.

The District Cell will have the responsibility of collation / aggregations of the data / information compiled in each health care facility and submit to the State Cell which will validate and forward the data to the National Cell.

Table 1 - Action points in accordance with Air Quality Index (Annexure)

AQI	Associated Health Impacts	Action Points
Good (0-50)	Minimal Impact	
Satisfactory (51-100)	May cause minor breathing discomfort to sensitive people.	-
Moderately polluted (101-200)	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.	Stop garbage burning Close/stringently enforce all pollution control regulations in brick kilns and industries Stringently enforce pollution control in thermal power plants through PCB monitoring periodic mechanized sweeping Strict norms vigilance and enforcement of PUC Stringently enforce rules for dust control in construction activities and close non-compliant sites Information-dissemination—Social media, mobile Apps should be used to inform people about the pollution levels,
Poor (201-300)	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease	Alert in newspapers/TV/radio to advise people with respiratory and cardiac patients to avoid polluted areas and restrict outdoor movement
Very Poor (301-400)	May cause respiratory illness to the people on prolonged exposure. The effect may be more pronounced in people with lung and heart diseases.	Stop use of diesel generator sets Stop use of biomass fuels for cooking, heating purposes
Severe (401-500)	May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.	Stop entry of heavy diesel vehicles Stop construction activities Shutting of schools Task force to shut down brick kilns, Hot Mix plants, Stone Crushers, power plants Increase frequency of mechanized cleaning of road and sprinkling of water on roads.

(Source: MoEFCC 2019)

Ambient Air Quality Characteristics (Year 2021) Garhwal Region

City	Dehradun												Rishikesh								Haridwar							
Locations	Clock Tower				Raipur Road				Himalayan Drug, ISBT				Nagar Nigam				SPS Hospital				SIDCUL				Rishikul			
Zone	Commercial				Commercial/ Residential				Commercial/ Industrial				Commercial				Commercial				Industrial				Industrial			
Month	P.M.10	PM2.5	SO2	NO2	P.M.10	PM2.5	SO2	NO2	P.M.10	PM2.5	SO2	NO2	P.M.10	PM2.5	SO2	NO2	P.M.10	PM2.5	SO2	NO2	P.M.10	PM2.5	SO2	NO2	P.M.10	P.M2.5	SO2	NO2
January	173.27	100.29	24.23	28.53	155.34	89.97	23.47	27.65	179.81	99.74	24.28	28.51	151.15	79.36	22.11	27.17	146.78	85.14	21.78	26.71	129.75	-	10.02	17.15	134.87	-	9.38	18.74
February	181.81	98.09	24.10	28.54	160.65	90.97	23.28	27.82	179.91	99.98	24.27	28.52	161.33	92.54	22.34	26.65	172.79	109.37	23.35	27.38	125.18	-	10.43	17.52	134.65	-	10.48	19.04
March	217.42	107.30	22.31	27.22	166.11	88.88	22.81	27.15	179.91	107.05	24.19	28.44	176.36	92.54	21.27	26.49	182.22	104.28	22.99	27.38	123.18	-	11.52	20	138.12	-	12.22	21.32
April	227.07	109.02	21.52	27.41	162.31	87.22	20.91	26.82	191.80	97.91	23.79	27.82	176.74	88.22	18.41	25.09	188.65	98.96	20.20	26.33	131.53	87.48	11.21	19.71	137.40	88	12.18	20.88
May	125.62	71.53	19.73	23.89	100.28	63.35	17.52	21.96	124.72	71.73	18.98	23.01	75.90	53.14	16.68	22.22	84.10	60.93	17.51	21.68	89.94	49.02	*	*	95.8	51.56	7.07	11.9
June	122.85	72.76	20.97	24.08	114.03	66.81	20.11	22.47	144.17	75.8	21.36	24.40	95.63	66.63	19.51	24.45	121.52	76.68	19.22	24.35	89.40	52.3	*	*	100.50	58.85	10.96	16.16
July	149.86	76.03	21.58	23.48	123.27	73.64	20.66	24.00	133.2	77	21.6	24.84	116.89	71.36	19.10	23.82	121.52	76.68	19.22	24.35	94.37	-	9.93	15.52	122.63	-	11.32	17.44
August	119.54	99.49	21.71	24.73	113.4	84.75	20.36	23.73	125.43	102.29	22.01	24.58	119.39	76.43	19.54	24.11	123.27	74.92	19.72	25.35	101.66	75.81	11.40	17.81	110.49	-	11.40	17.40
Sept	99.60	73.48	19.59	23.43	105.25	71.61	18.87	23.42	111.37	84.51	20.27	20.05	110.73	60.72	17.41	23.99	113.62	63.00	17.72	24.09	106.96	84.89	12.71	18.84	120.31	102.35	12.59	21.36
Oct	129.69	87.74	21.38	24.96	122.33	82.05	19.64	23.81	131.67	95.75	21.51	24.37	116.26	56.55	21.09	23.69	122.56	62.20	20.52	24.27	114.24	90.42	15.57	23.28	124.22	110.35	14.58	24.01
Nov	137.05	90.48	19.95	25.36	145.31	86.03	18.19	24.42	156.08	95.82	21.51	25.14	131.73	-	21.92	26.64	118.39	71.74	19.02	23.52	120.28	86.75	16.55	25.65	134.11	90.79	18.62	26.25
Dec	159.5	90.77	20.41	24.98	149.96	81.26	18.44	23.31	157.99	95.09	21.75	25.41	111.75	69.35	21.07	25.65	116.42	69.43	20.65	25.94	117.24	89.11	16.73	25.64	127.03	91.66	19.05	26.32
Average	**153.61**	**89.75**	**21.46**	**25.55**	**134.85**	**80.55**	**20.36**	**24.71**	**151.34**	**91.89**	**22.12**	**25.42**	**128.66**	**73.35**	**19.94**	**25.00**	**132.90**	**79.30**	**20.14**	**25.01**	**111.98**	**76.97**	**12.61**	**20.11**	**123.34**	**84.79**	**12.49**	**20.07**
Standards :																												
Annual	60		20	30	60		20	30	60		20	30	60		50	40					60				60			
24 hours	100		80	80	100		80	80	100		80	80	100		80	80					100				100			

*Note:- All values are in (µg/ m3)

Ambient Air Quality Characteristics (Year 2021) Kumaun Region

City	Haldwani					Kashipur				Kashipur		Kashipur		Rudrapur			
Locations	Govt. Hospital/Jal Sansthan					Govt. Hospital				Anaj Mandi		Ganna Ayukt		Govt. Hospital			
Zone	Commercial					Sensitive								Sensitive			
Month	P.M.10	S.P.M.	SO2	NO2	P.M. 2.5	P.M.10	P.M. 2.5	SO2	NO2	P.M.10	P.M. 2.5	P.M.10	P.M. 2.5	P.M.10	S.P.M.	SO2	NO2
January	117.86	184.1	8.02	26.13		119.93	203.82	18.04	26.22					123.58	212.51	18.84	22.3
February	117.04	183.41	8.17	27.52		125.14	210.80	18.74	22.78					129.12	221.53	19.35	22.92
March	116.26	182.51	8.25	27.84		121.37	208.92	19.09	22.83					127.89	224.87	19.15	23.31
April	110.4	176.86	7.95	26.87		115.7	197.04	18.83	21.76					122.32	206.77	19.20	23.08
May	84.51	150.94	5.24	21.45	26.98	122.40	206.83	18.30	22.16					128.85	216.79	19.88	23.35
June	98.86	164.28	6.00	22.87	34.78	123.85	209.69	18.22	21.59					127.25	215.94	20.15	22.68
July	112.07	178.48	6.83	25.40	37.75	125.29	211.09	18.30	21.87					129.13	219.17	IF	IF
August	112.99	179.24	7.11	25.38	39.96	118.61	188.88	17.57	21.23	128.7	215.01	126.72	207.76	121.28	208.44	IF	IF
September	112.62	183.86	7.32	25.62	39.51	83.40	142.22	14.59	17.74	102.83	162.85	102.83	162.85	92.96	153.75	18.73	20.93
October	114.71	180.92	7.47	25.57	35.86	106.67	IF	15.13	19.15	121.69	69.46	147.99	63.32	116.24	-	18.75	21.83
November	130.15	197.60	10.88	27.64	54.3	128.79	63.53	14.95	19.19	147.91	74.25	127.13	68.23	135.03	-	17.42	20.47
December	113.99	180.32	7.80	25.05	35.27	126.43	61.92	15.30	19.28	149.62	66.87	141.61	70.51	126.92	-	17.91	20.56
Average	**110.03**	**176.94**	**7.40**	**25.09**	**38.05**	**118.13**	**173.16**	**17.26**	**21.32**	**130.15**	**117.69**	**129.26**	**114.53**	**123.38**	**208.86**	**18.94**	**22.14**
Standards :																	
Annual	60		50	40	60					60							
24 hours	100		80	80	100					100							

*Note:- All values are in (µg/ m3)

Table: 3 Roles and responsibilities of health department, medical colleges & hospitals, health centres and link workers during Heat Wave

S.No	Department	Season	Roles and responsibilities
	Health department	During **Pre-Heat** Season (Annually from January through March)	• Create list of high risk areas (heat-wise) of districts/block/cities • Update surveillance protocols and programs, including to track daily heat-related data • Develop/revise and translate IEC in local language • Make a communication plan for dissemination of heat related alerts or education materials • Check inventories of medical supplies in health centers • Identify cooling centers and barriers to access cooling centers • Capacity building of health care personnel to detect and treat heat related illnesses • Community involvement for workers and trainers' education • Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning • Reassess 'Occupational Health Standards' for various types of Occupation. • Ensure Inter-sectoral convergence and coordination for improving architecture, design, energy efficient cooling and heating facility, increase in plantation i.e. Climate Resilient Green Building Design.
		During **Heat** Season (Annually from March through July)	• Ensure real-time surveillance and monitoring system in case of extreme event. • Prepare rapid response team • Distribute "Dos and Don'ts" to community • Effectively send a "Don't Panic!" message to community • Ensure access to Medical Mobile Van in the Red Zone • Ensure additional medical vans available • Ensure strict implementation of legislative/regulatory actions as per Occupational Health Standards. • Coordination with meteorological department for analysing cases and death data with meteorological variables like maximum temperature and relative humidity
		During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Medical College	During **Pre-Heat**	• Adopt heat-focused examination materials

	and Hospitals	Season (Annually from January through March)	• Get additional hospitals and ambulances ready • Update surveillance protocols and programs, including totrack daily heat-related data • Establish more clinician education • Continue to train medical officers and paramedics
		During **Heat** Season (Annually from March through July)	• Adopt heat-illness related treatment and prevention protocols • Equip hospitals with additional materials • Deploy all medical staff to be on duty • Keep emergency ward ready • Keep stock of small reusable ice packs to apply to PULSEareas • Report heat stroke patients to DSU daily • Expedite recording of cause of death due to heat related illnesses
		During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	For health centres and link workers	During **Pre-Heat** Season (Annually from January through March)	• Distribute pamphlet and other materials to community • Sensitize link workers and community leaders • Develop and execute school health program • Dissemination of materials in slum communities • Coordinate outreach efforts with other community groups, non-profits, and higher education
		During **Heat** Season (Annually from March through July)	• Recheck management stock • Modify worker hours to avoid heat of day • Visit at-risk populations for monitoring and prevention • Communicate information on tertiary care and 108 service
		During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan

Table. Other department's roles and responsibilities during Heat Wave

S. No	Department	Season	Roles and responsibilities
	Meteorological Department	**Pre-Heat**	Issue weather forecasts on Short/Medium/Long range duration
		Heat	• Issue Heat wave alerts • Coordination with health department for analysing cases and death data with meteorological variables like maximum temperature and relative humidity
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Dept of Drinking water & Sanitation	**Pre-Heat**	Identify vulnerable places
		Heat	Provide drinking water points at identified places and worksites
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Public Health & Engineering Dept	**Pre-Heat**	To construct cool shelters/sheds at public places, bus stands etc
		Heat	To maintain shelters/sheds, bus stands
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Municipalities	**Pre-Heat**	Review the heat preparation measures.
		Heat	Ensure implementation of guidelines of heat action plan
		Post-Heat	Review the heat preparation measures and make a note of the lessons learnt for the next season
	Dept of Education	**Pre-Heat**	Train and Sensitise teachers and students towards health impact of extreme events and disseminate health ministry approved prevention and first-aid measures
		Heat	• Rescheduling school timing during summer • During extreme events keep a check on outdoor activities • Close teaching institutes in case of issue of alert from Government
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Dept of Labour & employment	**Pre-Heat**	• Reassess 'Occupational Health Standards' for various types of Occupation.

			• Utilize maps of construction sites to identify more high-risk outdoor workers • Heat illness orientation for factory medical officers and general practitioners • Communicate directly about heat season with non-factory workers
		Heat	• Encourage employers to shift outdoor workers' schedules away from peak afternoon hours (1pm-5pm) during a heat alert or consider extended afternoon break or alternate working hours for workers. • Provide water at work sites
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Dept of Power supply	**Pre-Heat**	Maintenance of electrical lines
		Heat	Ensure uninterrupted supply of electricity
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan Participate in annual evaluation of heat action plan • Review revised heat action plan
	Dept of Forest & Climate change	**Pre-Heat**	Develop/encourage projects to decrease the 'Urban Heat Island effect'
		Heat	Ensure implementation of guidelines of heat action plan
		Post-Heat	Review the heat preparation measures and make a note of the lessons learnt for the next season
	Dept of Transport	**Pre-Heat**	Review the road map for preparation for the heat season
		Heat	Ensure implementation of guidelines of heat action plan
		Post-Heat	• Participate in annual evaluation of heat action plan • Review revised heat action plan
	Media or Press officer	**Pre-Heat**	• Secure commercial airtime slots for public service announcements • Identify areas to post warnings and information during heat season • Activate telephone heat hotline • Begin placing temperature forecasts in newspapers • Increase installed LED screens with scrolling temperature
		Heat	• Issue heat warnings in heat and electronic

			media • Contact local FM radio and TV stations for announcements • Use SMS, text and WhatsApp mobile messaging and centralized mobile databases to send warnings • Contact transport department to place warnings on buses
		Post-Heat	Evaluate reach of advertising to target groups and other means of communication such as social media

Annexure: NPCCHH : Activity Matrix

S. No.	Key Actions	Activity			Indicators (First 2 years- Short Term Activity)
		Short term (First two years)	**Medium Term** (up to five years)	**Long Term** (up to fifteen years)	
1.	**To create awareness among general population (vulnerable community), health-care providers and Policy makers regarding impacts of climate change on human health**				
	Development of IEC material on health impacts of Climate variability & change in coordination with NCDC	-Identify *nodal agency* to undertake communication needs assessment for the target groups - Develop *Communication Plan*& Tools -Develop *IEC materials* in Hindi, English and other vernacular languages. - Dissemination of IEC: mass media and inter-personal communication - Training & Sensitization of Health Care Providers	-Develop integrated IEC strategy -Explore inter-sectoral / inter-ministerial / civil society / NGOs for collaboration -Integrate health impacts of climate change into school and College curricula - Periodic Impact assessment of communication activities and monitor dissemination and utilization of IEC material -Explore additional sources of funding	-Determine whether the target population is covered/ informed timely -Commissioning of impact studies -Follow up 'Evaluation' of awareness activities -Actively pursue partnerships with other agencies	- Nodal Agency identified in the state/district to undertake IEC activities in the state. List out Communication plan and tools prepared at state and district level - No of posters, banners, newspaper advt, pamphlets/handbills prepared for dissemination in Hindi, English and Vernacular language at state and district level - No of IEC material disseminated at cinema halls, Bus and Trains, Newspaper advt, Radio-TV channel, Hoardings at public places, Wall paintings at health centres/hospitals, cycle rally at school/village/PHC level, Taluka level - No of Training sessions conducted- Refresher training, new recruits/ Medical, non-Medical staff/Pvt hospitals, General Physician, Hospital doctors at state and district level
	Advocacy on health impacts of Climate variability	-Advocacy forum to conduct and support workshops and meetings. - Evidence based Information to legislators	Provide evidence/ information for decision-makers to assess existing policies, practices and systems	Expand the span of coalitions to strengthen and support favourable	- No of ToT's identified and trained at State and District level. - No of biennial Training workshops at state and district level. - No of Quarterly Review meetings of District Nodal Officers,

	& change in coordination with NCDC	and decision makers on issues of climate change and impact on health	Involve community-based organizations (CBOs) for dissemination of information.	legislatures/ policies	Task Force (State and district) and Governing Body - No of national level trainings attended by the State and district level officials. -No of "biennial workshops for Teaching cadre, General Physician bodies, IMA bodies.

S. No.	Key Actions	Activity			Indicators
		Short term (First two years)	**Medium Term** (up to five years)	**Long Term** (up to fifteen years)	
2.	**To strengthen capacity of healthcare system to reduce illnesses/ diseases due to variability in climate**				
	Strengthening of health care system in context of climate change in coordination with NCDC	-Establish 'Environment Health Cell'(EHC) at Health deptt. - Depute State Nodal Officer –Climate change (SNO-CC) as focal point - Notify Task Force with multiple stakeholders and review existing Indian Public Health Standards and appropriate suggestions - State to form climate sensitive health Programme Implementation Plan (PIP)	Implement/ adapt/ modify Monitoring, Supervision and Evaluation tool for climate sensitive diseases -Coordinate with other agencies (municipalities, PRIs) for efficient and effective implementation of proposed activities at state and below level. - Phased Implementation of the recommendations of Task Force.	-Share appropriate technology like reduction in carbon footprint at healthcare facilities -Continue Phased Implementation of recommendations of Task Force.	- Notification of - SNO, State level EHC, State level Task Force, State level Governing Body - Notification of District Nodal Officers identified, District Environmental Health Cell, District Task Force formed." - State Action Plan for Climate Change and Human Health (SAPCCHH) developed, approved by the State Governing Body and launched by the state. - District specific Heat Action plan developed by the respective District Task Force. (State specific heat action plan will be a chapter of SAPCCHH and the respective district specific plan will be consolidated within the SAPCCHH) - PIP submitted to state NHM - Consultant Recruited in the state EHC

	Capacity building for vulnerability assessment at various levels and liaison with centre in coordination with NCDC	-Identify agency/ institute/ Organizations/ Centers of Excellencefor developing guidelines, capacity building, supporting implementation, monitoring, supervision. - Enlist (customized as per states' vulnerabilities) i) Technical committees/ working groups to support the focal point, ii) skilled staff, (iii) logistics, (iv) funds	- As per priority list, State to prepareguideline/ action plan and upload the same on its website for ready reference. -Develop training modules, organize training - Conduct meeting / Workshops/ Training on CC&HH for health care personnel - Sensitize and orient private health care providers	- Extend and expand trainings to reach health care staff till village level. - Conduct workshops/ structured training in new treatment/ management technologies at regional or local level - Disseminate reports and good practices;	- Names of related institutes and NGO's identified per state specific climate sensitive illnesses in the state and district. - No of SNO's/ DNO's trained at National/State level Trainings, Workshop and ToT. - Details of funds mobilised and utilised from other sources (Govt/NGOs)

S. No.	Key Actions	Activity			Indicators
		Short term (First two years)	**Medium Term** (up to five years)	**Long Term** (up to fifteen years)	
3.	**To strengthen health preparedness and response by performing situational analysis at national/ state/ district/ below district levels.**				
	Develop/ strengthen the monitoring and	- Develop / strengthen surveillance for each CSD - Train all concerned personnel on surveillance system (data collection, collation and analysis)	- Build an interdisciplinary platform i.e. link health databases with real-time monitoring of weather, climate, geospatial, and exposure data so as to accurately	Update monitoring and surveillance system as per new evidences Evaluate inter-	-No of polluted cities identified for ARI surveillance in the state and no of Sentinel Surveillance Hospitals Identified from polluted cities - No of polluted cities where ARI

	surveillance systems for climate sensitive diseases in coordination with NCDC	- Integrate relevant non-health data in the health surveillance system - Initiate Sentinel & real-time surveillance for illnesses due to Air Pollution, Heat etc	forecast health illness/ event - Develop/ modify mechanism and indicators to monitor trend of CSDs. - Conduct Joint Review Missions / Central Internal Evaluations and feedback mechanisms.	disciplinary platform and upgrade as per evolving technologies. Identify gaps for research	surveillance has initiated as per SOP - No of hospital identified with 'Special Cold Room' (SCR) for management of heat related illnesses - Coordination with SDMA regarding death due to heat related illnesses. - Coordination with respective IMD offices for climate data for analysis of climate sensitive illnesses - Coordination with the respective State Pollution Control Board for getting AQI data. - No. of Biennial Training Workshops of concerned personnel on surveillance system (data collection, collation and analysis)
	Develop mechanisms for EWS/ alerts and responses at state, district and below district level in coordination with NCDC	Constitute multi-stakeholder working group for development of early warning system for each CSD - Design and integrate public health response plan with Meteorology Dept, NDMA, EMR	-Review monitoring and surveillance system of CSDs -Develop thresholds/ prediction models for health events or CSDs. -States to develop communication plan and dissemination systems to warn people and communities	Evaluation and modifications for the appropriateness of the plans' for -Thresholds of action -Interventions to maximize response effectiveness for the relevant community or region.	- Establishment of Working group by EHC for development of a mechanism for EWS/ alerts for climate sensitive illnesses -Steps taken by EHC to develop mechanisms to integrate public health response plan with related stakeholders (SPCB, NDMA, IMD etc.)

S. No.	Key Actions	Activity			Indicators
		Short term (First two years)	**Medium Term** (up to five years)	**Long Term** (up to fifteen years)	
4.	**To develop partnerships and create synchrony/ synergy with other missions and ensure that health is adequately represented in the climate change agenda in the country**				
	Develop joint action plan with other deptt./ organizations In view of their capabilities and complementarities in coordination with NCDC	-Identify or assess aspects/areas underserved in management of CSDs - Develop affordable and acceptable tools for risk reduction and Environmental Health Impact Assessment - Establish *Corporate Social Responsibility* / *Accountability* in terms of finances for implementing measures for prevention/reduction/treatment ofCSDs	- Broaden Stakeholders' network and partnership and reassess service areas to be served for climate related health risk reduction and Environmental Health Impact Assessment. - Evaluate Corporate Social Responsibility (CSR) under laws for Health strategies, Policies and measures for promotion of health - Meeting/ Consultation with local governing body for reassessment of roles and services and appropriate resource allocation and for limiting duplication of actions	- Reassess toolsfor risk reduction and Environmental Health Impact assessment. - Share best management practices which are affordable and acceptable in social/ traditional context locally - Evidence based support to decision makers for addressing gaps in climate resilient healthcare services	- State specific Affordable and acceptable tools developed for risk reduction and Environmental Health Impact Assessment by the State Task Force. - No of Corporate Houses involved with the state to invest in mitigation/ adaptation of climate sensitive illnesses through CSR Fundseg. Printing and dissemination of IEC, conduct training and workshops, greening of hospitals, help in research etc. - No of medical colleges (Private and Govt.) involved with the State EHC
	Integrate, adopt and implement environment	- Increase plantation in and around building to make it 'Green' - Incorporate measures in building design for making it	- Expand measures to make healthcare sector 'Green'. - Replicate the successful 'model of building design' for new	Assess and document reduction of climate risk in climate resilient building	- No of plants planted in the various health care facilities- PHC, CHC,SDH, DH annually - No of Green Hospital models

	friendly measures suggested in other missions on climate change in coordination with NCDC	climate resilient - Use technologies which reduce harmful chemicals emission & carbon foot-print - Use of energy-efficient equipments and services	healthcare facilities - Explore and support technologies, equipments and services which are energy efficient and reduce harmful chemicals emission & carbon foot-print	design for replication in other states and UTs	Initiated, Constructed and Renovated at Primary, -Secondary and Tertiary levels. - No of prototype hospital buildings prepared which are resiliant to Disasters (Floods, Cyclones, earthquake, Tsunami) - No of health facilities where solar panels installed, LEDs installed, rain water harvesting done
S. No.	**Key Actions**	**Activity**			
		Short term (First two years)	**Medium Term** (up to five years)	**Long Term** (up to fifteen years)	**Indicators**
5.	**To strengthen research capacity to fill the evidence gap on climate change impact on human health.**				
	Strengthening of healthcare services based on researches on climate variables and impact on human health in coordination with NCDC	- Create database of professionals, researchers and institutions engaged in studies of impact of weather and climate on health - Create a platform for 'data-repository' of various researches on climate and health effects -Scenario-building (initiation of study, data sources, mechanism used, apportionment of risk factor, methodology, assumptions, model used,	- Development of models mathematical or other types for early warning alerts for CSDs. -Develop / adapt techniques for modelling or use other research advances by transitioning them into operational products and decision support tools - Reassess health data esp CSDs using modelling techniques - Inform Policy-makers about 'scenario' of health-related	- Develop and validate models, enhance research on the effectiveness of CSDs management. - Evaluate and improve the effectiveness of modelling technique. - Evidence based information to Policy-makers - Conduct seminars, workshops,	- List of professionals, researchers and institutions engaged in studies of impact of weather and climate on health at the state and district level. - Creation of 'data-repository' of various researches on climate and health effects at state and district level. - List of 'best practices' in implementation of measures to combat the effect of climate change - Number of seminars in a year on CSDs and

		confidence interval) for establishing relation of climate variables and health impacts. - Identify best practices in implementation of measures to combat the effect of climate change	statistics with focus on CSDs. - Conduct seminars, workshops, conferences on best practices of measures to combat effect of climate change on human health.	conferences on best practices of measures to combat effect of climate change on human health.	related aspects including 'best practices' at state and district level.