Ministry of Health and Family Welfare
Government of India

State Action Plan on Climate Change and Human Health

Uttarakhand

Version 2

National Centre
for Disease Control
Government of India

National Programme
on Climate Change
and Human Health

CONTENTS

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

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".

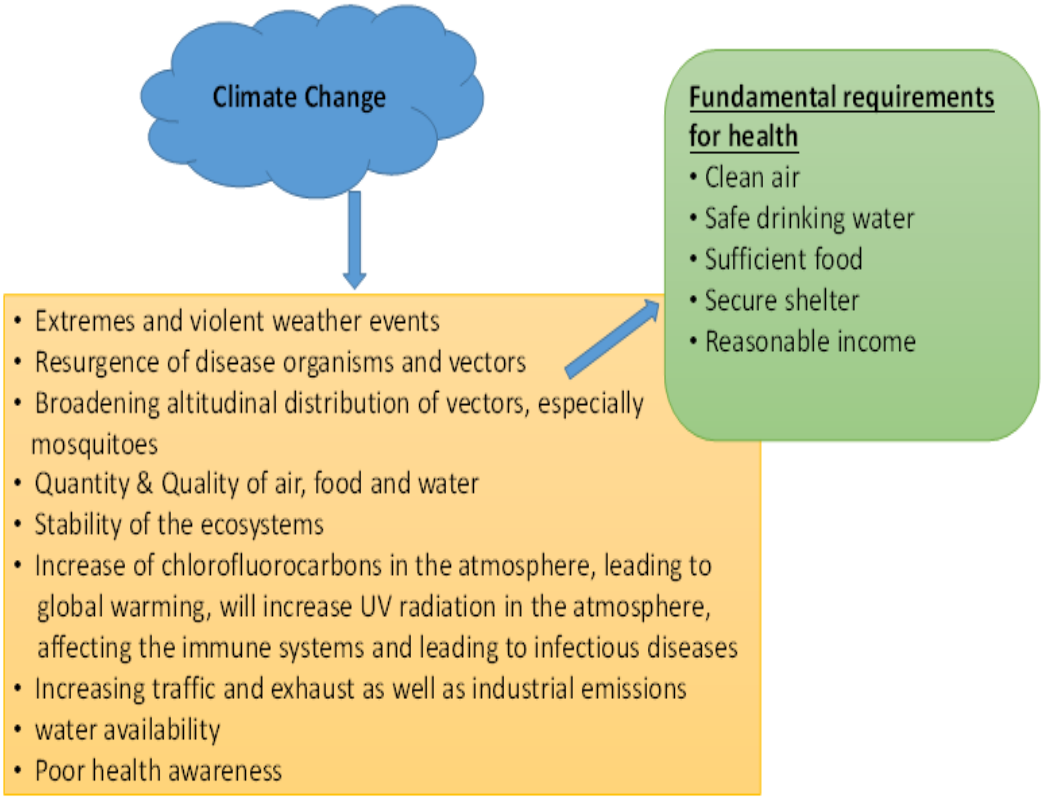
India is a signatory to the "*Male' Declaration"* which calls for the strengthening of the health sector and achieving climate resilience. According to the "Male' Declaration", it is desired that the health-care facilities should be prepared to address the human needs in face of climate change-induced 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

National Centre for Diseases Control (NCDC), MoHFW 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) 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 301km 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

*Data as per Census 2011

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

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.

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.

Table 1: District wise profile of government health institutions in Uttarakhand

S. No	*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 (1Gov/2 Pvt)	6	5	47	175
6	Haridwar		4	8	29	160
7	Nainital	1 (Gov)	4	10	45	141
8	Pauri Garhwal	1 (Gov)	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**

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.

Uttarakhand forms a part of the Indian Himalyan Regpion (IHR). The Himalaya have become highly vulnerable due to geological reasons, additional stress caused by exploitation of natural resources, increased population pressures and other related challenges. These effects are likely to be exacerbated due to the impact of climate change, which may adversely impact the Himalayan ecosystem through increased temperature, altered precipitation patterns, more recurrent episodes of drought and negative biotic influences. If average temperatures increase as predicted (increases in

average temperatures and variations in rainfall patterns have already been observed in the region), all aspects of human and natural life will be affected. Locally, the ability of people to cope with will be challenged; further away, changes in the Himalaya, extreme rainfall events and glacier melt could affect the lives and livelihoods of around millions of people living in the river basins downstream.

Uttarakhand is most vulnerable to climate-mediated risks. Mountainous regions are particularly vulnerable to climate change and have shown 'above average warming' in the 20th Century. According to the Intergovernmental Panel on Climate Change (IPCC), impacts are expected to range from reduced genetic diversity of species to glacial melt in the Himalaya, leading to increased flooding, which will affect water resources within the next few decades.

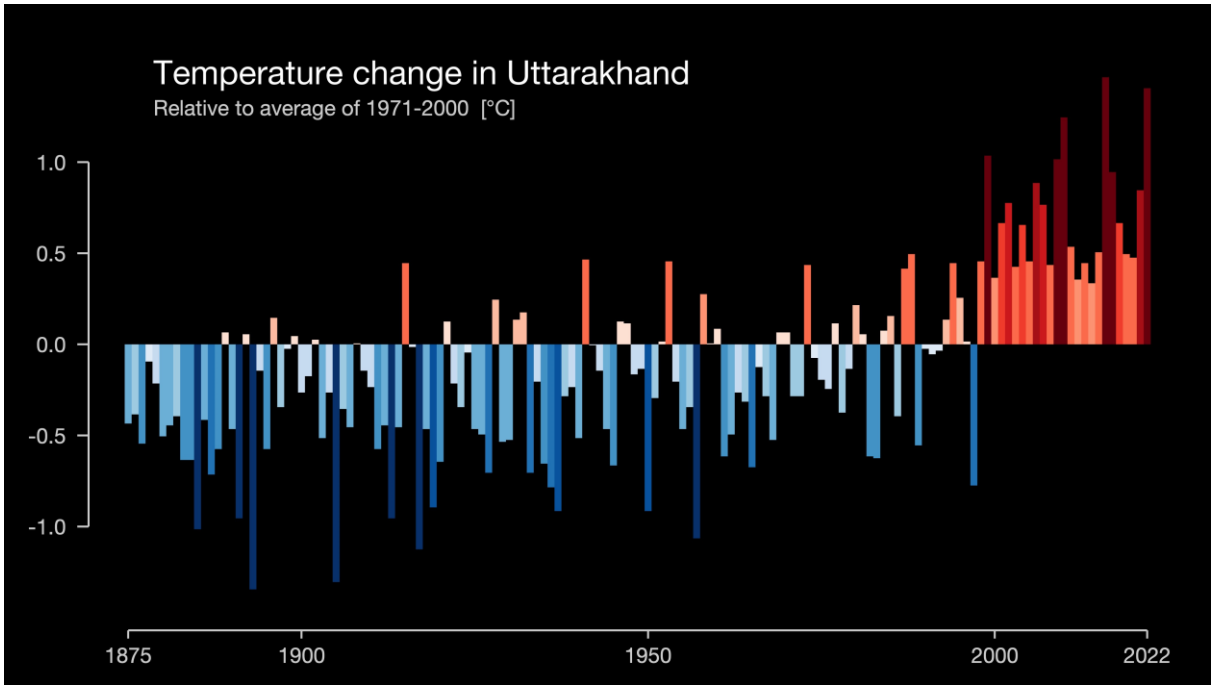
Some of the reported climate-change-induced changes in the Uttarakhand Himalaya include receding glaciers and an upwardly moving snowline, depleting natural resources, erratic rainfall, irregular winter rains, advancing cropping seasons, fluctuations in the flowering behaviour of plants, shifting of cultivation zones of apple and other crops, reduction in snow in winter, a rise in temperature, an increasing intensity and frequency of flash floods and drying up of perennial streams.

Broadly, the region constitutes of 13 districts falling in two major administrative units, viz., Garhwal (north-west portion) and Kumaon (south-east portion). Garhwal Division consists of seven districts, i.e. Dehradun, Haridwar, Uttarkashi, Tehri, Pauri, Rudraprayag, and Chamoli, while the remaining six districts, viz., Pithoragarh, Bageshwar, Almora, Nainital, Champawat, and Udham Singh Nagar, fall in Kumaon Division. The elevation ranges from 210 to 7817 m. The state has two distinct climatic regions: the predominant hilly terrain and the small plain region.

Temperatures: The state has observed increasing trend in average annual temperatures. However, the pattern of temperature change varies based on altitude. 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.

The climatic conditions of Uttarakhand vary greatly due to variations in altitude and proximity towards Himalayan ranges. The climatic conditions of the plains are very similar to those in the Gangetic plain, i.e. tropical conditions. Summers are relatively hot and winters are chilly, with temperatures going below 0°C. The lowest temperature recorded is –3.0°C at Mukteshwar and the highest is 43.2°C at Pantnagar. The extremes can further intensify, depending upon the coverage of meteorological observatories.

Figure 1: Annual Average Temperature Chang, Uttarakhand



Source: University of Reading

According to a recent assessment report, Uttarakhand experiences higher rates of warming compared to the global average. Analysis of climate models in Dehradun reveals that almost every year since 2004 has been hotter than the average temperature from 1981 to 2010. The warmest years, 2010 and 2016, were both 1 degree warmer than the reference period. It is likely that the region has already surpassed a 1.5-degree increase above temperatures from the late pre-industrial era (1891-1900), resulting in various impacts such as a rise in tropical conditions and accelerated melting of snow and ice. Precipitation trends are not clearly discernible, and the historical data exhibits significant year-to-year variability, including extremely high precipitation in 2010 and several years with either very low or high precipitation (-/+40%).

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.

The average rainfall in the state varies from 92 cm, in Srinagar, to 250 cm in Nainital. However, spatial distribution of the rainfall varies, depending upon the geographical location and slope and aspect of the place. The amount of rainfall is generally high in low mountainous regions such as Nainital and Dehradun and it gradually decreases with increasing height. About three-fourths of the total rainfall is confined to the monsoon season and remaining one-fourth occurs in other seasons due to the western disturbances and local orographic effects. The monsoonal activities generally start in the later part of June and pick up in July/August. The temperature and precipitation

distributions and overall climatic conditions of the various districts of Uttarakhand are shown below.

Figure 2: Temperature variability in Uttarakhand (Source- SAPCC, Uttarakhand)

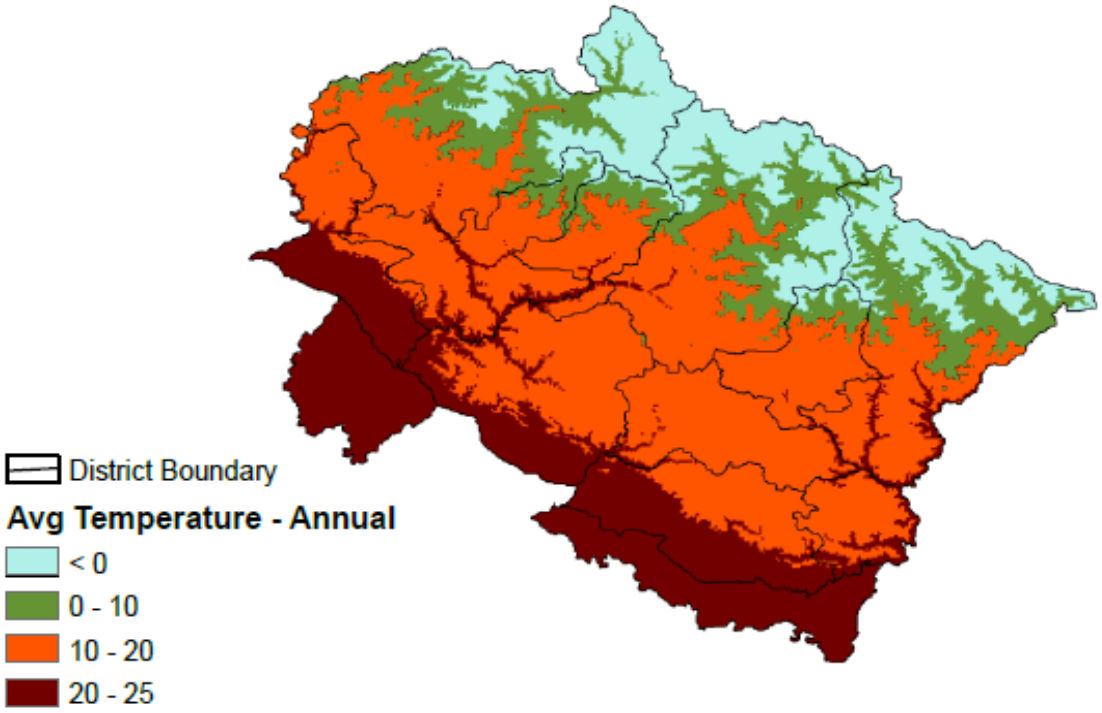
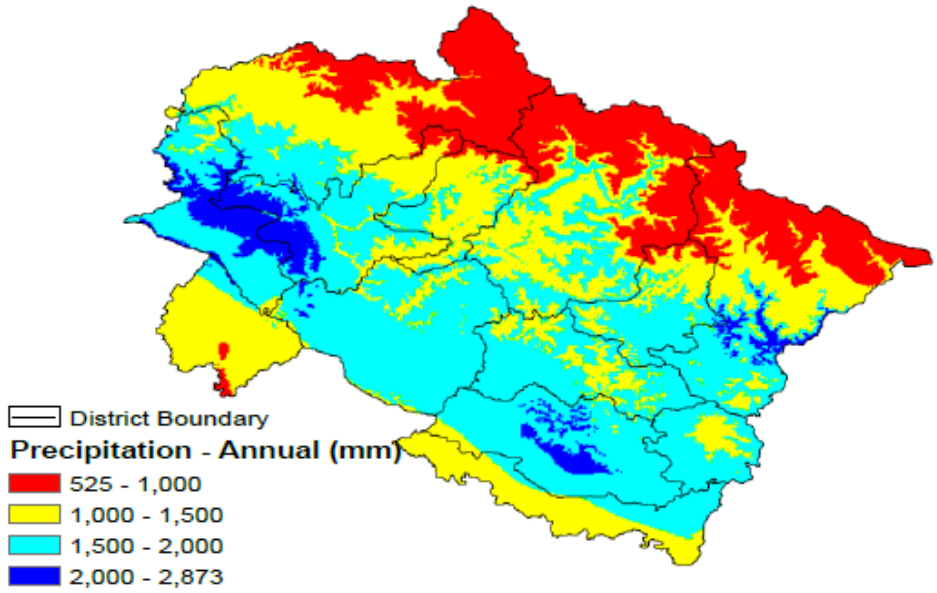


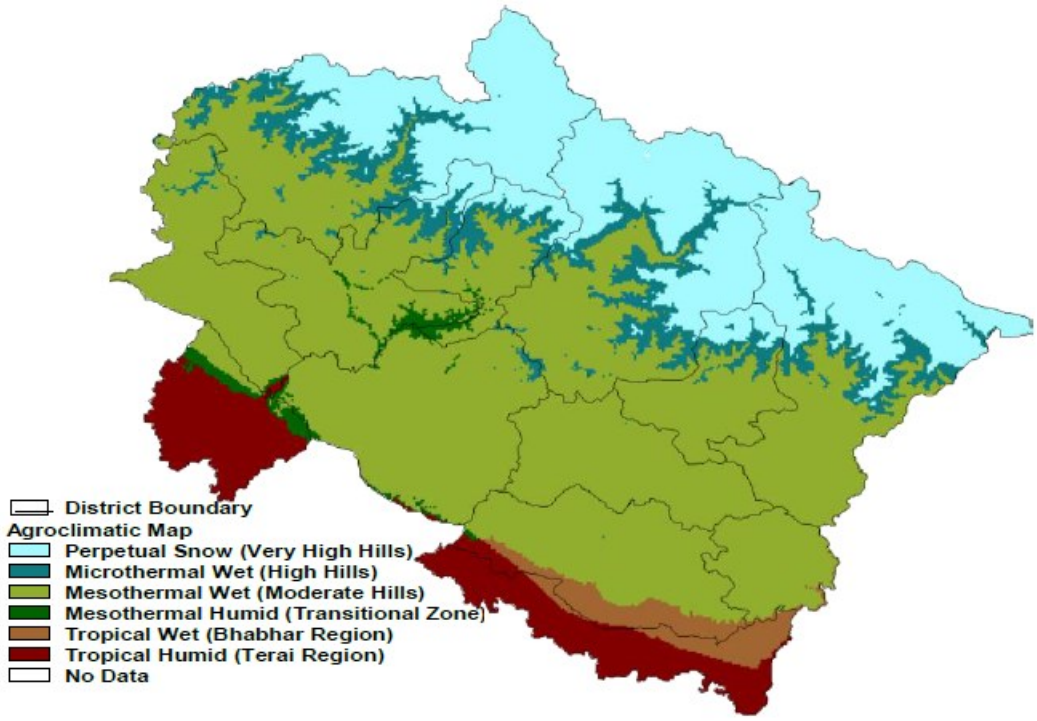
Figure 3: Precipitation variation in Uttarakhand (Source- SAPCC, Uttarakhand)



The rainfall at Pantnagar is increasing at a rate of about 10 mm/year. This is largely due to the few high-rainfall events in the recent past. Otherwise, the amount of rainfall over the years is almost constant, with large inter-annual variability. A very alarming trend can be observed in the bright sunshine hours, which are decreasing at a rate of about 2 h/100 years.

The bright sunshine hours are decreasing due to the increasing cloud cover. Increasing cloud cover is also responsible for the night warming and day cooling as it reflects the solar radiation back to space during the day and retards the long-wave radiation from the earth, which does not allow night cooling. The weather and climate are highly influenced by the local land use pattern and different physiographic processes and therefore may vary strongly from one place to another. The trends in the climate parameters can also vary spatially. Therefore, the climatic pattern of all stations should be precisely analysed in order to place a location-specific action plan.

Figure 4: Climatic conditions in Uttarakhand



Data indicates that the average temperature of Almora, i.e., 17.55°C (1955–2007).

The rainfall records (2000–02) suggest that the peak of the annual hyetograph has been shifted from July to August and since the last two decades there are incidences when the peak
of the annual hyetograph is being formed in the month of September. **This indicates that in future the peak of the annual hyetograph may be shifted from August to September.**

The shifting of rainfall peak in the annual hyetograph reveals that the rainfall rhythm is gradually changing in Uttarakhand due to climate change. The state witnessed very heavy rainfall in 2013 which was in the range of 124.5 – 244.4mm. On 15-17 June, 2013,

there was a heavy downpour resulting in natural calamities in different part of the state and especially in the Kedarnath valley.

There also has been an increasing trend of occurrence of drought incidences in the recent past. Rainfall records from Hawalbagh, Almora reveal that between 1964 and 2000 the total incidences of draught were 16, out of which 5 were severe but between 2001 and 2009, 7 draughts occurred out of which 3 were severe.

Decline in snow cover, results of the spot studies from Uttarakhand reveal that the glaciers of Uttarakhand are retreating at different rates in different time periods.

The state of Uttarakhand is prone to variable temperature and precipitation concerns in the near future as well as in the long term climate scenarios as indicated by the RCP 4.5 projections indicated below. Further, the state is also prone to multiple extreme weather events, including earthquakes and landslides due to decrease in forest cover and increase in population density. This is further exacerbated by the presence of high floating population i.e. tourists and the burden of associated infrastructure demand. The details of state's vulnerability to extreme weather events is indicated in the maps presented below-

Figure 5: Projected changes in annual maximum temperature for mid and end of century, Uttarakhand

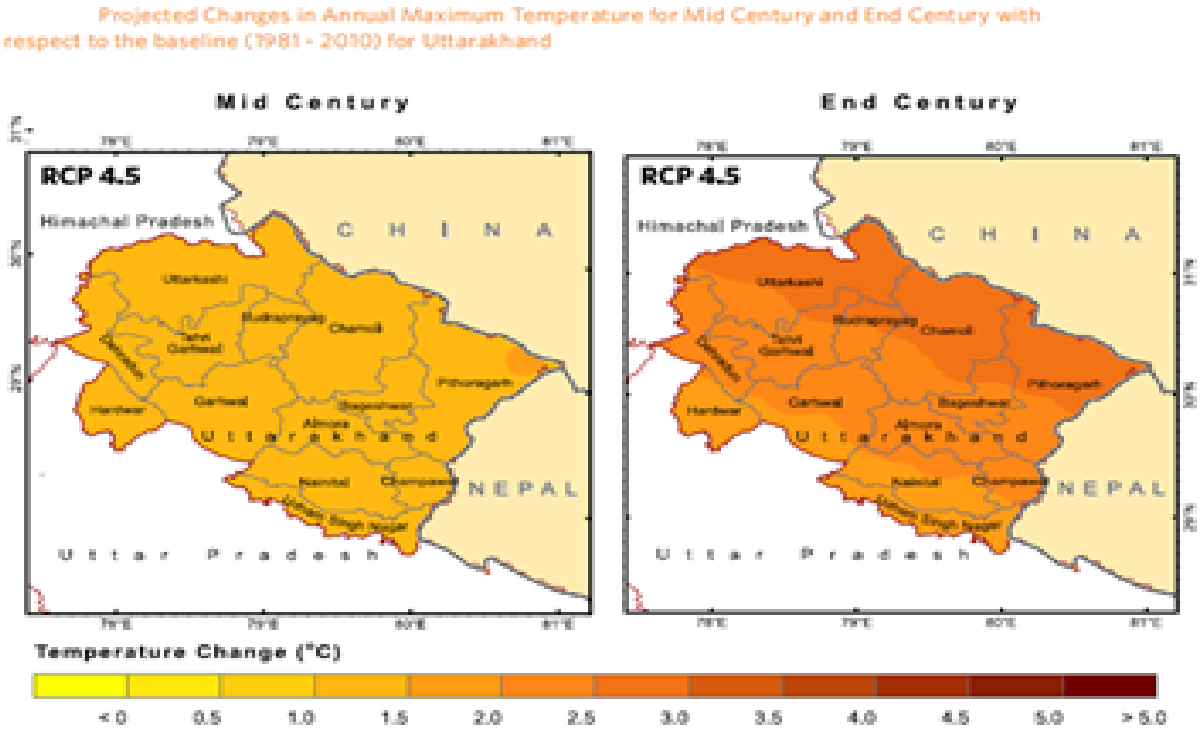


Figure 6: Landslide prone zones, Uttarakhand

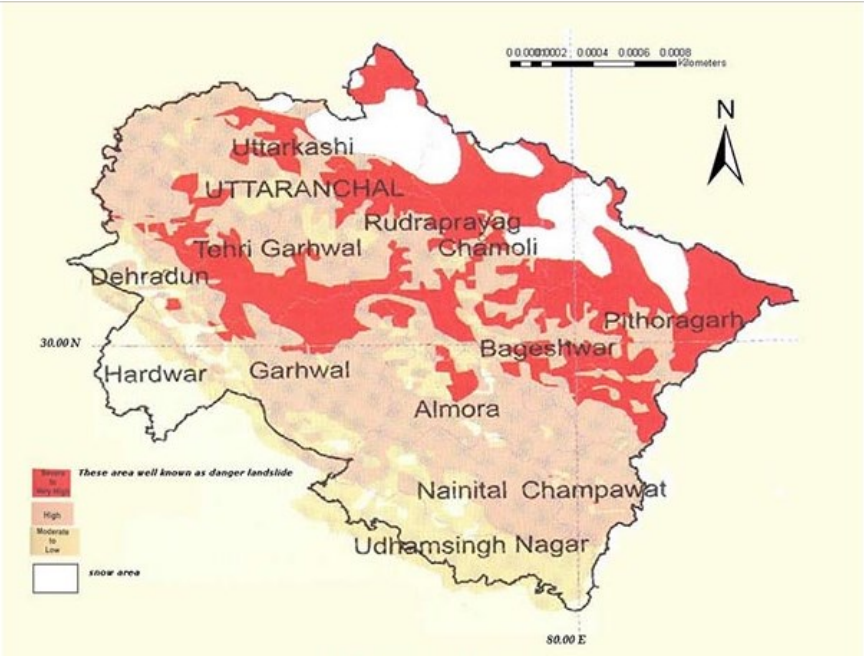
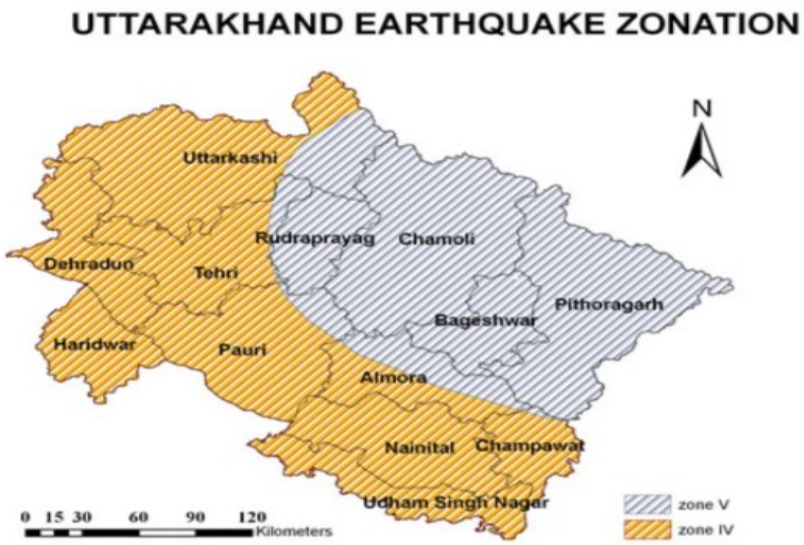
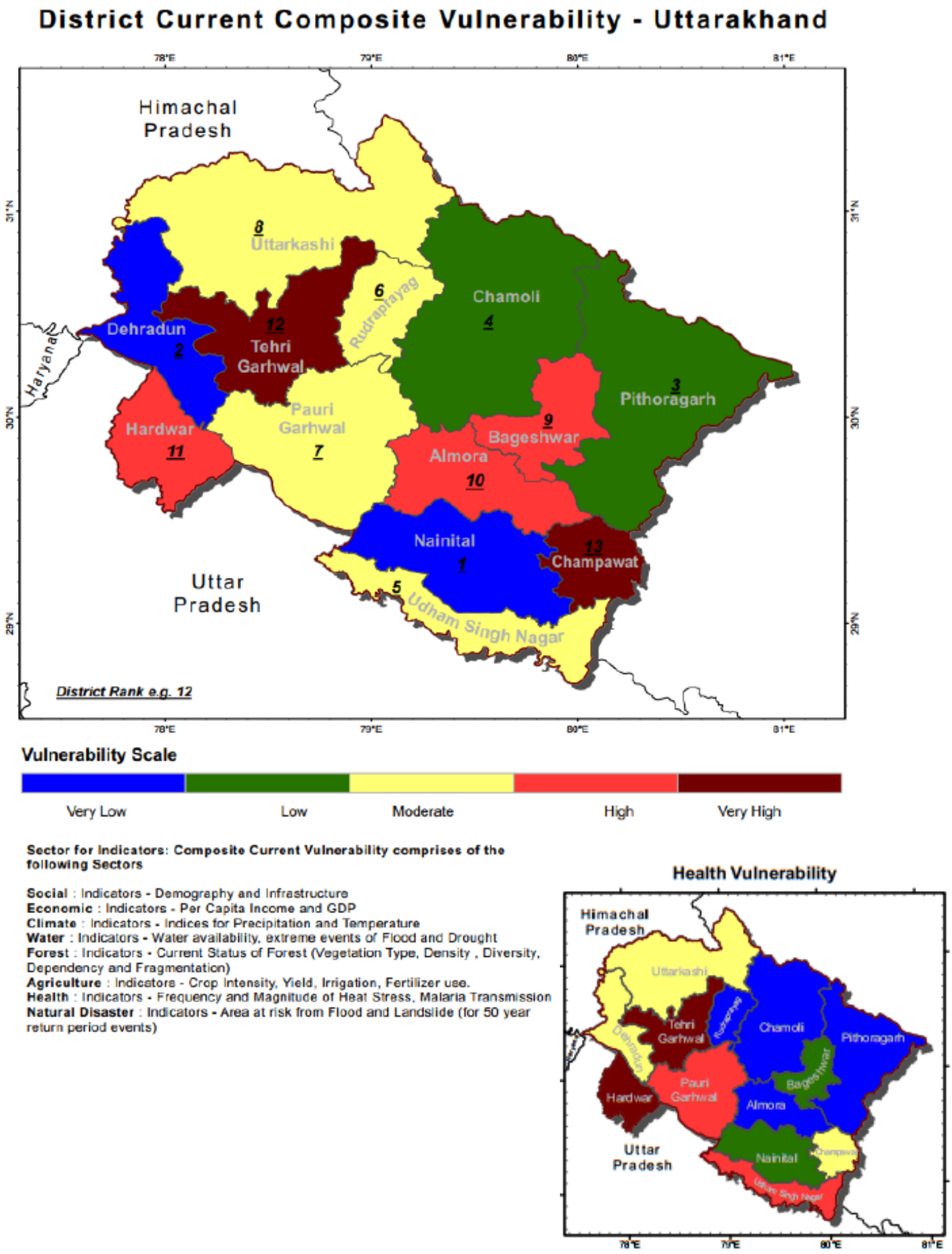


Figure 7: Landslide prone zones, Uttarakhand



A composite and sectoral vulnerability index has been assessed at district level. It is constructed using 78 indicators like social, economic, climate, water resources, forest, agriculture, health and natural disaster sector. This will be used to focus relevant action and prioritize resource allocation under NPCCHH.

Figure 8: District-level Composite Vulnerability Index, Uttarakhand



Sector for Indicators: Composite Current Vulnerability comprises of the following Sectors

Social : Indicators - Demography and Infrastructure
Economic : Indicators - Per Capita Income and GDP
Climate : Indicators - Indices for Precipitation and Temperature
Water : Indicators - Water availability, extreme events of Flood and Drought
Forest : Indicators - Current Status of Forest (Vegetation Type, Density , Diversity, Dependency and Fragmentation)
Agriculture : Indicators - Crop Intensity, Yield, Irrigation, Fertilizer use.
Health : Indicators - Frequency and Magnitude of Heat Stress, Malaria Transmission
Natural Disaster : Indicators - Area at risk from Flood and Landslide (for 50 year return period events)

Issues, Challenges for Health Sector in Context of Climate Change

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.

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.

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.

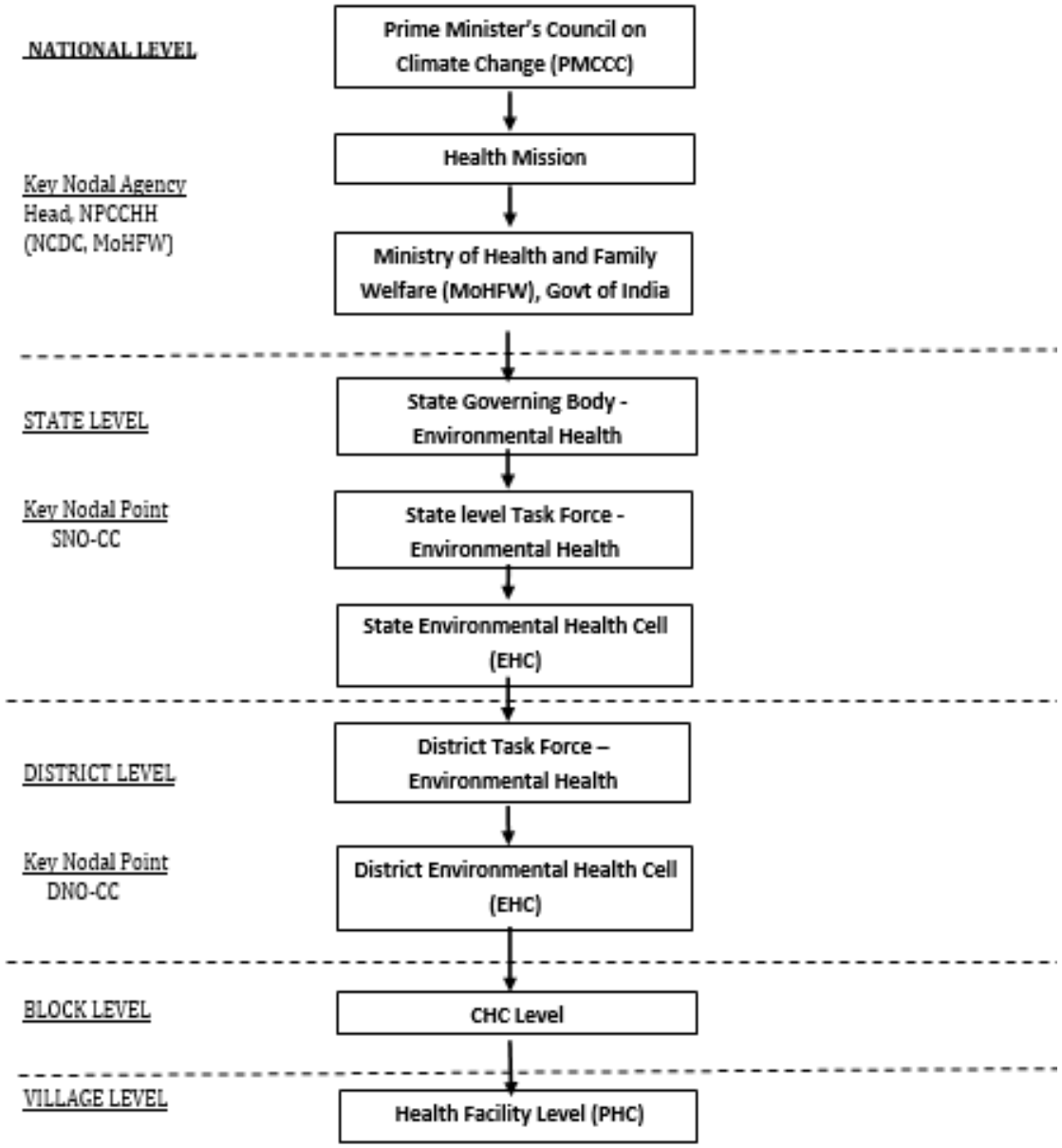
Objective 4:

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.

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. **(Annexure 4)**

DHS will create a ***State 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.

Dr. Pankaj Kumar Singh

State Nodal Officer- Climate Change and Human Health (SNO-NPCCHH).
(Annexure 3)

Ph: 8587863243

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

A list of district nodal officers of Uttarakhand is attached. (Annexure 5)

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:

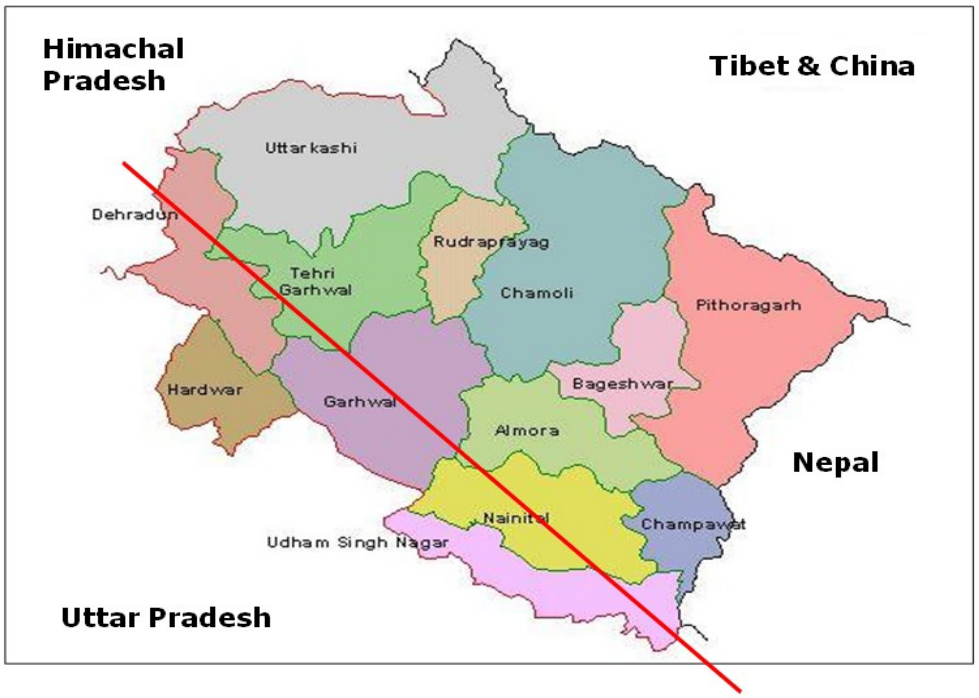
- Medical Superintendent (CHC Hospital): Chairman
- Taluka Health Officer/ Talukas Health Officer: Member Secretary
- Health Education Officer/ Similar Post: Member
- Block Development Officer: Member
- Health Supervisor: Member

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.

Climate Sensitive Diseases/Health Issues Prevalent in Uttarakhand

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. 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.



Climate Sensitive-Illnesses in the State: In accordance to the climate variability and the vulnerability mapping of the state, following issues have been mapped to be prominent climate-sensitive issues in Uttarakhand affecting the human population-

Direct impacts

- Natural Disasters/Extreme weather events: Extreme heat and cold, Flood, Landslides

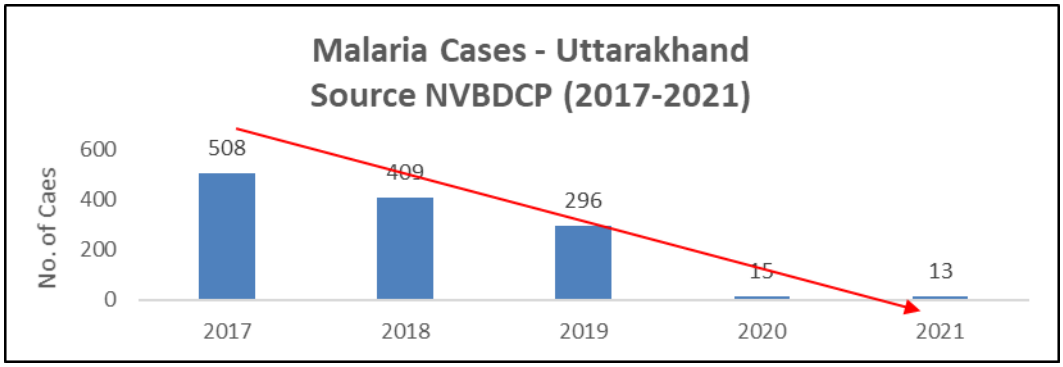
Indirect impacts

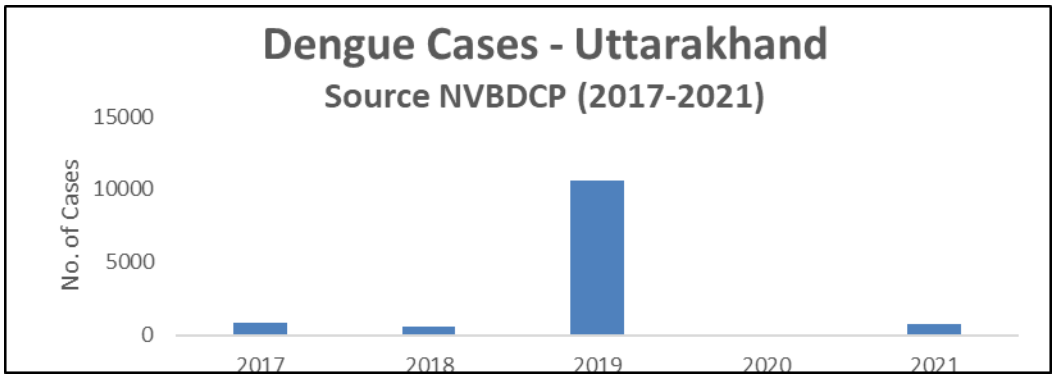
- Vector-borne disease: Dengue, Malaria, Scrub Typhus etc
- Food & waterborne diseases: Malnutrition
- Water borne diseases due to water scarcity
- Air pollution related illnesses
-

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.

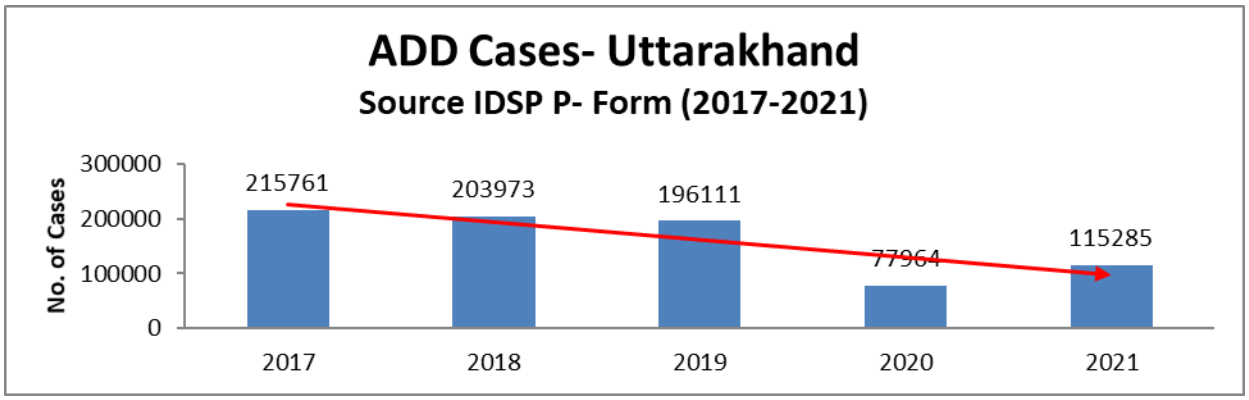
In terms of vector borne diseases, a decline in cases has been observed in Uttarakhand, in the recent years, in accordance with the IDSP surveillance, as indicated below-

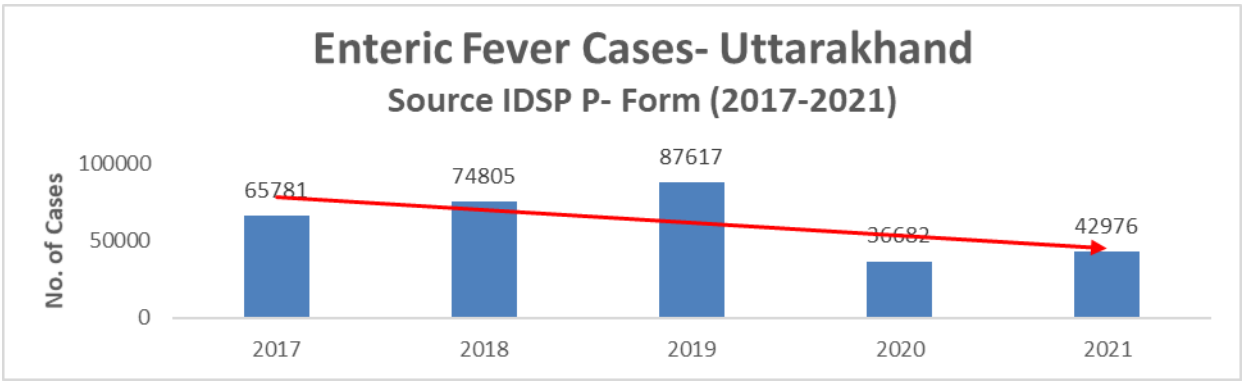




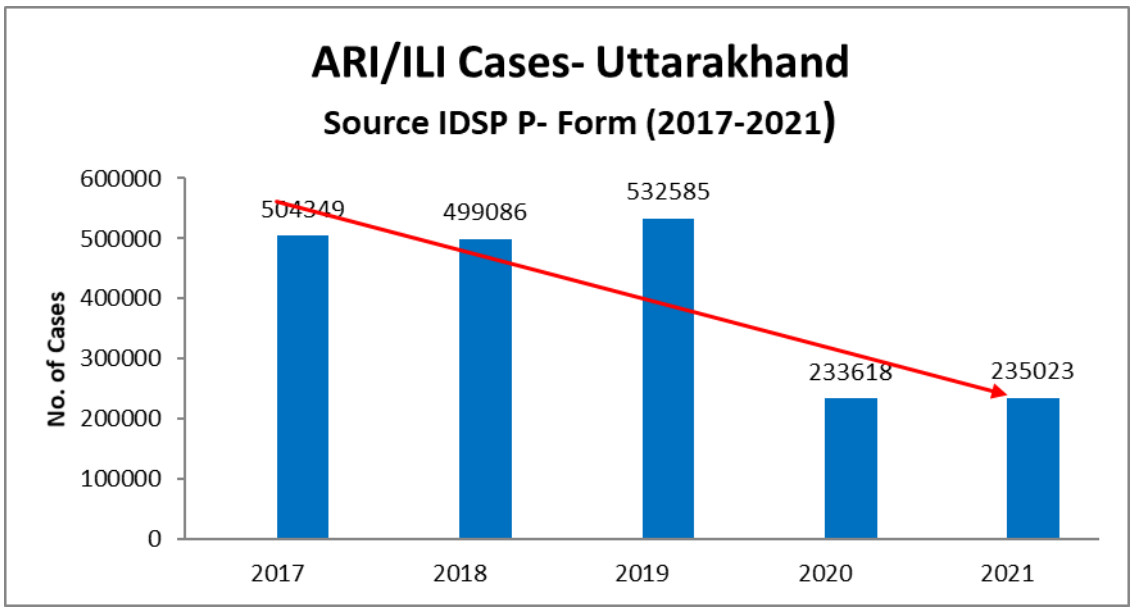
Water-Borne diseases: Most of the drinking water sources of Uttarakhand are surface water sources, which are directly exposed to point sources of pollution such as septic tanks, domestic and farming wastes, as well as to soil with high humus content. In the Kumaon region, about 97% and 88% of raw water 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. As indicated below, although the case load of water borne diseases in the state is showing a decline, the case load still remains high.





Acute Respiratory Illness in Context of Air Pollution: According to global burden of diseases study, air pollution contributed to about 9.3% of DALY (disability adjusted life years), 2nd highest among all risk factors, in Uttarakhand in 2016. The DALY rate for lower respiratory infections was also higher in Uttarakhand with estimate 2000-2499 DALY/100,000 population.



Dehradun, Kashipur and Rishikesh are three are non-attainment cities under National Clearn Air Programme (NCAP) and requires priority action to establish Acute Respiratory Illness Surveillance in context of air pollution and health sector prepardness to manage health impact of air pollution.

Pollution level recorded by CPCB in major cities of Uttarakhand, 2011-2019

Pollutants recorded		**2010**	**2011**	**2012**	**2013**	**2014**	**2016**	**2017**	**2018**	**2019**
Dehradun	PM10						241	248	217	168
	NO2	29.5	24	28.3	27.7	29.3	29.3	29		28.7
Kashipur	PM10						126	111	105	132
	NO2								23	23
Rishikesh	PM10						119	128	133	137
	NO2		22	24	25	28	27	27		27

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.

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

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

Key components of Health adaptation plan of ARI:

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

1. IEC & AWARENESS GENERATION

National Guidelines are available on NCDC website:

- Public Health Advisory on Air Pollution and Health (2021 Revised)
- Health Adaptation Plan For Diseases Due To Air Pollution -
- Health Sector Preparedness for Air Pollution
- Handbook for Health Professionals on Air Pollutions & Its Impact on Health

IEC Campaign

IEC is a very effective tool of raising awareness among community and vulnerable populations.

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

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

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 website:

1. Training Module for Health Professionals
2. Women Training Manual (Hindi)
3. Women Training Manual (English)
4. Women Flipchart (Hindi)
5. Women Flipchart (English)

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

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, Dehradun, Kashipur and Rishikesh three cities are identified for establishing sentinel surveillance and following 6 sentinel hospitals have been identified in Uttarakhand state.

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

Refere Health Adaptation Plan for Disease Due to Air Pollution:
https://bit.ly/NPCCHHNOADS

- All health facilities in a district (PHC and above) especially in NCAP cities and cities with high air pollution levels should ensure implementation of this plan to prepare health facility to prevent and manage cases arising/aggravating from high air pollution exposure.

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.
3.

Health Adaptation Plan for Heat-related illness

Uttarakhand is one of the 23 heat-vulnerable states which requires comprehensive actions to adapt and mitigate impact of extreme heat. Special attention to be given to urban areas due to urban heat island effect and vulnerable districts listed on page __ during implementation of IEC and health facility preparedness.

1. Information, Education Communication (IEC) Activities

Target population:

- **Urban areas**
- **Vulnerable groups** (Primarily Children, women, older adults, traffic police, outdoor workers/vendors)

i. **Annual IEC dissemination plan on Heat and Health under NPCCHH, Uttarakhand**

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/OBD calls etc.	a. Development of IEC tools and printing b. Hiring of agency for folk activities	*2 Posters for Healthcare facilities in all districts*	***February to March***	*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)		***April to July***					
5.			*1 in all the Healthcare facilities*						

Observance of important environment-health days

Day	Activities on Heat-Health
• World forest Day (March 21) • World Water Day (March 22) • **World Health Day (April 7)** • Earth Day (April 22) • **World Environment Day (June**	IEC Campaigns • Audio-video spots broadcasting • Targeted awareness sessions: traffic police, schools, women, children • Street plays and local cultural activities, Rallies • Sports events • Competition: poster, poem/essay, quiz

5) • World Day to Combat Desertification and Drought (June 17)	Community level heat mitigation measures • Plantation drive • Cool-roofing drive • Energy conservation Health facility level activities • Health facility-based patient awareness sessions • Energy audit and conservation measures • Review of preparedness for heat-related illness

2. Capacity Building Activities

i. Training material

Guidelines:

- National Action Plan on Heat Related Illnesses (https://bit.ly/NAPHRI)

Training modules: (available bit.ly/NPCCHHguidelines)

- State-District level training modules
- Medical officer training
- Para medical officers & Health care workers
- Community level training: vulnerable population group such as women/ children/ elderly/ different type occupations

Other training resources: NPCCHH channel https://bit.ly/NPCCHHyt

- Clinical Aspects of Heat-Related Illnesses
- Webinars on heatwave and its health impact
- HRI surveillance training

ii. State-Level/ District-Level Supporting Training institutes:

- State Institute of Health & Family Welfare

Training on Heat-related illnesses diseases may be expanded to include other climate sensitive health issues specifically extreme weather events.

iii. Annual training plan for Heat and Health under NPCCHH, Uttarakhand

Training Programme for	Trainer	Topics	Timeline
District level (DNO-CC,	State Level Trainers	- Heat-health impact, prevention measures	February

trainers)	SNO-CC, Consultant	- Surveillance reporting and analysis with weather parameters - Health facility preparedness	
Health facility level (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	- Heat-health impact, prevention measures - Surveillance case identification and reporting - Health facility preparedness - Clinical management of HRI	February
Community Health care workers (MPH, ASHA, ANM etc)	District Level Trainers, MO	- Heat-health impact prevention - Indoor and outdoor mitigation measures	February-March
Panchayati Raj Institutions	District level trainers, MO, Health care workers	- Heat-health impact prevention - Indoor and outdoor mitigation measures	February-April

3. Strengthening Health Sector Preparedness

➢ **National Heat-Related Illness Surveillance (NHRIS), NPCCHH**

i. Surveillance guidelines and reporting formats:

Digital HRI surveillance is conducted on Integrated Health Information Planform (IHIP) since March 1, 2023. Reporting is done at https://ihip.nhp.gov.in/npcchh/.

National Action Plan on Heat Related Illnesses (https://bit.ly/NAPHRI)

- Case definitions
- HRI reporting formats: health facility to state level (forms 1 to 4)
- Death investigation form for suspected heatstroke deaths

ii. Reporting units: All health facilities in a district (PHC and above) should submit daily reports from March 1-July 31 regardless of observed temperatures and rainfall using their P-form level access to IHIP.

iii. Surveillance training: included under capacity building section

iv. Surveillance reporting and HRI monitoring:

- Daily monitoring of surveillance activity and health data monitoring should be done at district level in IHIP.

v. **Health Sector Preparedness**

Guidelines

- National Action Plan on Heat Related Illnesses (https://bit.ly/NAPHRI)
- **Advisory for State Health Departments on Heat Wave Season 2023**
- **Strengthening Health Systems Preparedness for Heat Related Illnesses (HRI) in India** (18 April, 2023)

vi. **Revision of Health Action Plan on Heat Related Illnesses** in State Action Plan on Climate Change and Human Health (SAPCCHH): The section should be revised every year after July based on targets achieved, surveillance data, climate change impacts and health indicators with support from multi-sectoral task force,

➢ **Heat Action Plan for Specific Cities/Rural Districts**

Urban areas often become hotspots of heat impact due to altered land use, reduced land cover, reduced natural shade and use of built material that trap heat during day and night time. Urban heat island effect poses greater threat to larger swath of population by impeding night natural cooling leading to continuous heat stress compared to that in rural area. As such health-centric multisectoral coordinated adaptation and mitigation efforts at city level are a necessity and an opportunity not only for reducing heat impact but also for reduction of greenhouse gas emission.

➢ **City-Specific Heat-Health Action Plans** are encouraged and should supported by State EHC.
City-Specific Heat-Health Action Plans should include:

1. Early warning system and inter-agency emergency response plan:
    a. Analysis of historic city level all-cause mortality with observed temperatures to establish health impact-based warning and response trigger (IMD, SDMA)
    b. Daily dissemination of forecast and observed temperature during summer to public and government agencies (IMD)
    c. Identification of roles and responsibilities of coordinating agencies with activity matrix and action checklists (Refer: Ahmedabad Heat Action Plan[12])
2. Public awareness
    a. Communicating risk to vulnerable population groups
3. Capacity building of medical professionals
    a. On identification, management and reporting of HRI cases and deaths
4. Promoting short and long-term adaptation and mitigation measures
    a. Access to potable water, shaded area, cooling spaces

b. Plantation, cool-roof

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.

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

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**	• Ensure real-time surveillance and monitoring

		Season (Annually from March through July)	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 and Hospitals	During **Pre-Heat** Season (Annually from January through March)	• Adopt heat-focused examination materials • 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

4. Inter-departmental coordination for preparedness and response to heateave

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

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

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		Chikungunya	
	Cases	Death	Cases	Death	Cases	Death	Cases	Death
2017	508	0	849	0	0	0	0	0
2018	409	0	591	2	22	1	11	0
2019	296	0	10622	8	9	0	1	0
2020	15	0	76	1	4	2	0	0
2021	13	0	738	2	1	0	1	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

1. 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

2. 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
Health Care Workers	MO	Community Health Workers (ANM, MPHW, CHO, ASHA)	

Panchayati Raj Institutions	MO, CHO	Panchayati Raj Institutions, communities	borne diseases

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, Health care workers	- Role of climate change impact in VBD burden, prevention measures

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.

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.

Ranking of Districts based on exposure, sensitivity and adaptive capacity to flood, drought & cyclone

Rank	District	Event	Exposure	Sensitivity	Adaptive Capacity	Vulnerability Index	Vulnerability
125	Nainital	Flood & Drought	0.63	0.57	0.4	0.377	Moderate
227	Pithoragarh	Flood & Drought	0.16	0.7	0.36	0.131	Low
272	Uttarkashi	Flood	0	0.22	0.47	0	Very Low

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

1. 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 Reduction	IEC Campaigns • Audio-video spots broadcasting • 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

2. 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

3. 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.

4. Surveillance:

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

ii. 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

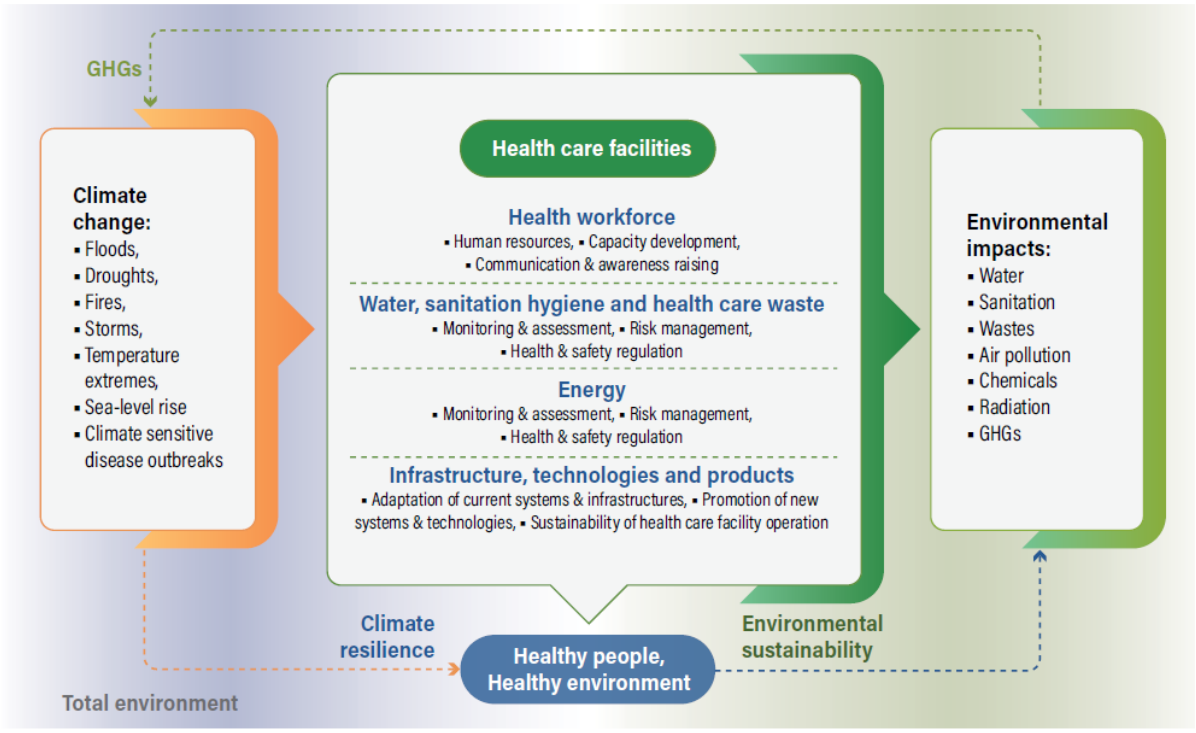
- Generate awareness among community.
- Training of community members for preparedness and response due to disaster/extreme weather events

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**

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 %

Guidelines from NPCCHH

- **Guidelines for Green and Climate-Resilient Health Facilities (2023):** https://ncdc.gov.in/showfile.php?lid=959
- **Guidelines for Solar Powering Health Facilities (2023)** https://ncdc.gov.in/showfile.php?lid=960

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

Budget FY 2022-27

Budget Head	Activity	FY 2022-23 (Rs in Lakh)	FY 2023-24 (Rs in Lakh)	2024-25	2025-26	2026-27
				Projected		
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

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**				

Annexure 1: 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.

Name of the State	**Name of the State Nodal Officer (SNO)**	**Quarter Period**
O.M. of appointment of State Nodal Officer	Annexed (Yes / No)	
Postal Address of State Nodal Officer **Phone (O)** **(M)** **E Mail address:**		
Consultant*		
No of Consultant permitted	1 or 2	
No of Consultant appointed		
O.M of appointment of Consultant	Annexed (Yes / No)	

	Programme Activities /Deliverable		
1	**Constitution of State Governing Body (SGB)**		
A	If **State Governing Body (SGB)** constituted?	Yes/No	
B	If Yes, provide O.M. of constitution of SGB	Annexed (Yes / No)	
C	SGB meeting held in past quarter	Yes/No	
D	Minutes of last meeting held	Date of Meeting / /	Annexed (Yes / No)
2	**Formation of State Multisectoral Task Force (SMTF)**		
A	If **State Multisectoral Task Force (SMTF)** formed?	Yes/No	
B	If Yes, provide O.M. of constitution of SMTF	Annexed (Yes / No)	
C	SMTF meeting held in past quarter	Yes/No	
D	Minutes of last meeting held	Date of Meeting / /	Annexed (Yes / No)
3	**Establishment of Environmental Health Cell (EHC)**		
A	If State has established **EHC**?	Yes/No	
B	If Yes, provide O.M. of establishment of EHC	Annexed (Yes / No)	
C	If Yes, provide list of members	Annexed (Yes / No)	
4	**State Action Plan on Climate Change and Human Health (SAPCCHH)**		
A	If State has submitted SAPCCHH?	Yes/No	

B	If Yes, version number of SAPCCHH	No:	Month/Year ____/____
5	**Designated District Nodal Officer -Climate Change (DNO-CC)**		
A	If State has identified DNO-CC in all districts?	Yes/No	
B	No of Districts in State/UT		
C	No of Districts appointed DNO-CC		
D	O.M. of appointment of DNO-CC's	Annexed (Yes / No), If Yes, No of Districts____	
6	**Formation of District Multisectoral Task Force (DMTF)**		
A	If **District Multisectoral Task Force (DMTF)** formed?	Yes/No	
	No of Districts appointed DTF		
B	If Yes, provide O.M. of constitution of DMTF	Annexed (Yes / No), If Yes, No of Districts____	
C	DMTF meeting held in past quarter	Yes/No, If Yes, No of Districts____	
D	Minutes of meeting held in past quarter	Annexed (Yes / No)	If Yes, No of Districts____
7	**Capacity Building of State & District Nodal Officers on Climate Change**		
A	Have the SNO attended the TOT?	Yes/No	
B	Have the Consultant/s attended the TOT?	Yes/No	
C	Whether the training has been conducted on Climate Change and Human Health in past quarter for	DNO -CC	Yes/No
		Medical Officer	Yes/No
		Health Workers	Yes/No
D	No of health care professionals trained in past quarter on Climate change and Human Health	**Health care personnel**	**No of trained**
		DNO -CC	
		Medical Officer	
		Health Workers	

E	**Training on Air pollution**		**Training on Heat Related Illnesses**	
	Health care personnel	**No of trained**	**Health care personnel**	**No of trained**
	DNO -CC		DNO -CC	
	Medical Officer		Medical Officer	
	Health Workers		Health Workers	
F	**Training on any other Climate issues**		**Health care personnel**	**No of trained**
			DNO -CC	
			Medical Officer	
			Health Workers	
G	No of Sensitization workshop/ meeting at State level on CC&HH matters in past quarter		No :	Report Annexed (Yes / No)
H	No of Sensitization workshop/ meeting at District level on CC&HH matters in past quarter		No :	Report Annexed (Yes / No), If Yes, No _____
I	Training of Panchayat Raj Institutions in past quarter		No of Blocks :	
			No of activities held:	Report Annexed (Yes / No), If Yes, No _____

8	**IEC in past quarter**					
A	**At Block level in past quarter**					
	Pollution	**Total No**	**Heat**	**Total No**	**Other Climate issues**	**Total No**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	

B	At District Level in past quarter					
	Pollution	**Total No**	**Heat**	**Total No**	**Other Climate - issues**	**Total No**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	
C	**At State level in past quarter**					
	Pollution	**Total No**	**Heat**	**Total No**	**Other Climate issues**	**Total No**
	No of audio		No of audio		No of audio	
	No of video		No of video		No of video	
	No of social media		No of social media		No of social media	
	No of posters		No of posters		No of posters	

9	**Observation of public health days related to Climate Change in past quarter**		
A	World Environment Day observed?	Yes/No /Not Applicable	
	If Yes, report submitted with details	Report Annexed Yes/No	
B	International day of Clean Air and Blue Skies observed?	Yes/No/Not Applicable	
	If Yes, report submitted with details	Report Annexed Yes/No	
C	Other events observed in past quarter	YES/No	
	If Yes, report submitted with details	Report Annexed Yes/No	

10	**Printing in past quarter**	
A	No of Training modules printed in past quarter	
B	IEC printed	
C	Others printed	Details.. Yes/No
C	Articles contributed to NPCCHH Newsletter for past quarter activities	Attached.. Yes /No

11	**Budget**		
A	Total budget sanctioned in ROP for Financial Year (Rs in lakhs)**		
B	Total received by SNO for expenses in FY		
C	Total budget spent till the end of past quarter (Rs in lakhs)		
D	Total budget distributed to districts **(for all the districts)**	District 1	OM Annexed (Yes / No)
		District 2	OM Annexed (Yes / No)

At the State level

	FMR code	**Activities**	**Budget Received**	**Quarter I**	**Quarter II**	**Quarter III**	**Quarter IV**	**Total Expenditure**
1	3.3.3.3	Training of PRI						
2	5.1.1.2.13	Greening						
3	9.2.4.9	Training of MO's, Health workers, Programme Officer's						
4	10.2.14	Surveillance						
5	11.4.7	IEC						
6	12.17.3	Printing						
7	16.1.2.1.23	Task force Meeting						

8	16.1.2.1.24	Review of DNO-CCHH with SNO-CCHH						
9	16.4.1.5.2	Consultant-CCHH						
	Date of submission			**Signature of SNO**				

**** The budget approved under ROP of all the States/UT is annexed in Annexure II**

Annexure 2: Ambient air quality reported in Garhwal and Kumaun, 2021

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)

Annexure 3: Notification of State Nodal Officer, Uttarakhand

Directorate of Medical Health and family Welfare Uttarakhand
Danda Lakhound, P.O. Gujrada, Sahastradhara Road, Dehradun
E-mail- dghealth.uttarakhand@gmail.com, Contact No. 0135–2608763, Fax:0135–2608746

Letter No: 23प / दैवीय आपदा / 2 / 2016 / Dated: 11/12/13

:: Office Order ::

Dr. Pankaj Kumar Singh,
Assistant Director,
Medical Health and Family Welfare,
Uttarakhand.

In reference to letter No. F. No. 67/CEOH/NCDC/2018-19/SAPCCHH Dated 05th November, 2018 of Centre for Environmental health and Occupation health, climate change and Health, NCDC, Delhi, you are being nominated as State Nodal Officer (Climate Change and Health) to look after Climate change and Health related issues of the State.

(Dr. Tara Chand Pant)
Director General

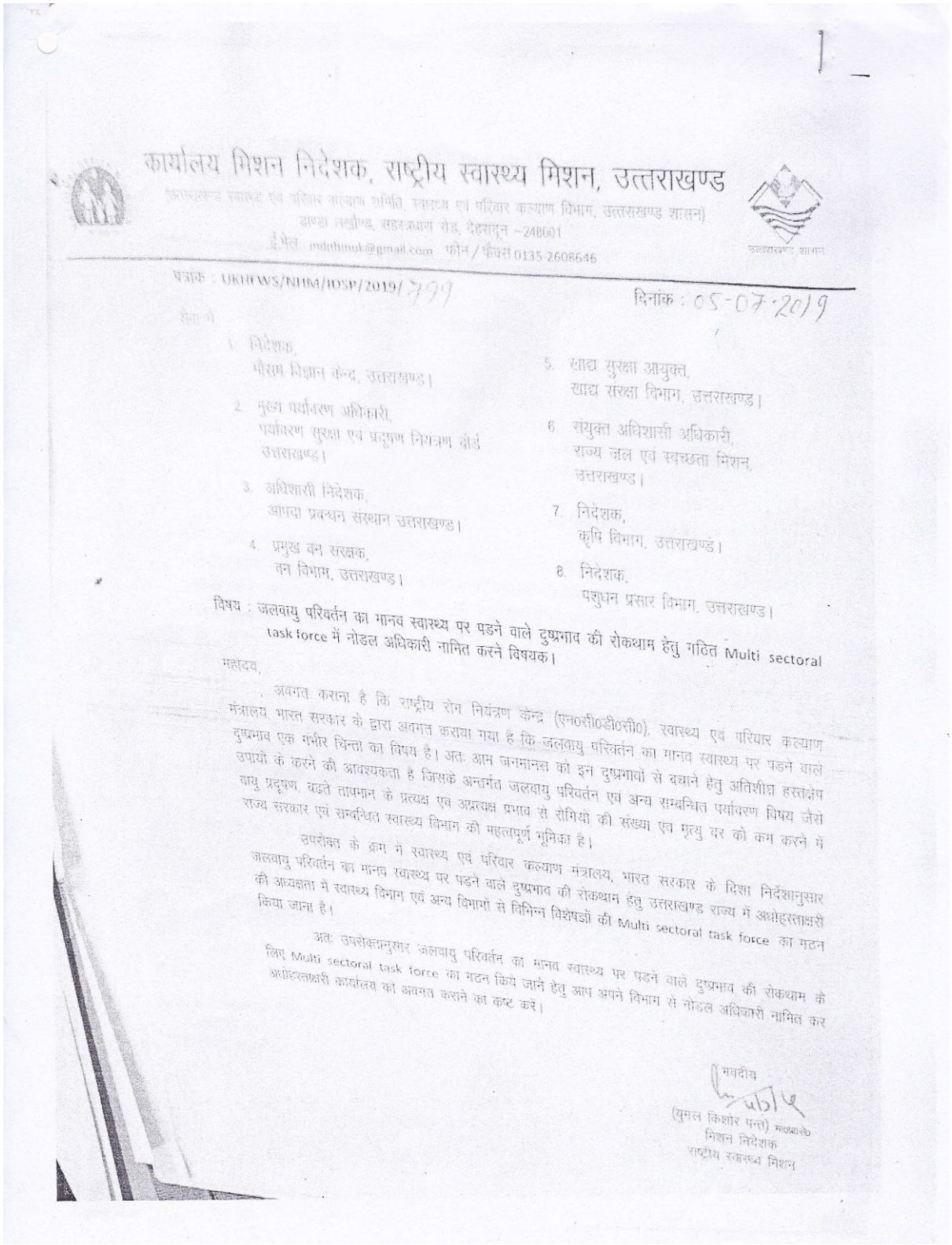
Letter No: 23प / दैवीय आपदा / 2 / 2016 / 2941 3 Dated as above

Copy to the following for information:

1. Secretary, Medical Health and Family Welfare, Government of Uttarakhand.
2. Mission Director, National Health Mission Uttarakhand.
3. Dr. Akash Srivastava, Joint Director and Head, Centre for Environmental health and Occupation health, climate change and Health, NCDC, Delhi.
4. Dr. K.K Mitra, Senior Regional Director, Regional Office for Health and Family Welfare, Lucknow.

(Dr. Tara Chand Pant)
Director General

Annexure 4: Notification of Multi Sectoral Task Force of Uttarakhand



कार्यालय मिशन निदेशक, राष्ट्रीय स्वास्थ्य मिशन, उत्तराखण्ड

डाकघर तल्लीताल, सहस्त्रधारा रोड, देहरादून – 248001

ई-मेल: mdnhmuk@gmail.com फोन / फैक्स 0135 2608646

पत्रांक : UKHFWS/NHM/IDSP/2019/ 799 दिनांक : 05-07-2019

सेवा में,

1. निदेशक,
   पौराम विज्ञान केन्द्र, उत्तराखण्ड।
2. मुख्य पर्यावरण अधिकारी,
   पर्यावरण सुरक्षा एवं प्रदूषण नियंत्रण बोर्ड,
   उत्तराखण्ड।
3. अधिशासी निदेशक,
   आपदा प्रबन्धन संस्थान उत्तराखण्ड।
4. प्रमुख वन संरक्षक,
   वन विभाग, उत्तराखण्ड।
5. खाद्य सुरक्षा आयुक्त,
   खाद्य सुरक्षा विभाग, उत्तराखण्ड।
6. संयुक्त अधिशासी अधिकारी,
   राज्य जल एवं स्वच्छता मिशन,
   उत्तराखण्ड।
7. निदेशक,
   कृषि विभाग, उत्तराखण्ड।
8. निदेशक,
   पशुधन प्रसार विभाग, उत्तराखण्ड।

विषय : जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव की रोकथाम हेतु गठित Multi sectoral task force में नोडल अधिकारी नामित करने विषयक।

महोदय,

अवगत कराना है कि राष्ट्रीय रोग नियंत्रण केन्द्र (एन0सी0डी0सी0), स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के द्वारा अवगत कराया गया है कि जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव एक गंभीर चिन्ता का विषय है। अतः आम जनमानस को इन दुष्प्रभावों से बचाने हेतु अतिशीघ्र हस्तक्षेप उपायों के करने की आवश्यकता है जिसके अन्तर्गत जलवायु परिवर्तन एवं अन्य सम्बन्धित पर्यावरण विषय जैसे वायु प्रदूषण, बढ़ते तापमान के प्रत्यक्ष एवं अप्रत्यक्ष प्रभाव से रोगियों की संख्या एवं मृत्यु दर को कम करने में राज्य सरकार एवं सम्बन्धित स्वास्थ्य विभाग की महत्वपूर्ण भूमिका है।

उपरोक्त के क्रम में स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के दिशा निर्देशानुसार जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव की रोकथाम हेतु उत्तराखण्ड राज्य में अधोहस्ताक्षरी की अध्यक्षता में स्वास्थ्य विभाग एवं अन्य विभागों से विभिन्न विशेषज्ञों की Multi sectoral task force का गठन किया जाना है।

अतः उपरोक्तानुसार जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव की रोकथाम के लिए Multi sectoral task force का गठन किये जाने हेतु आप अपने विभाग से नोडल अधिकारी नामित कर अधोहस्ताक्षरी कार्यालय को अवगत कराने का कष्ट करें।

भवदीय

(युगल किशोर पन्त) भा0प्र0से0
मिशन निदेशक
राष्ट्रीय स्वास्थ्य मिशन

कार्यालय मिशन निदेशक, राष्ट्रीय स्वास्थ्य मिशन, उत्तराखण्ड

(उत्तराखण्ड स्वास्थ्य एवं परिवार कल्याण समिति/ स्वास्थ्य एवं परिवार कल्याण निदेशालय, उत्तराखण्ड शासन)
छाप्पड़ वाला, सहस्त्रधारा रोड, देहरादून -248001
ई मेल- nhmuknrhm@gmail.com फोन / फैक्स 0135-2608646

पत्रांक : UK10WS/NHM/IDSP/2019/ 861 दिनांक : 05-07-2019

कार्यालय आदेश

1. प्रभारी अधिकारी, राष्ट्रीय वेक्टर जनित रोग नियंत्रण कार्यक्रम।
2. प्रभारी अधिकारी, आई0सी0ए0पी0।
3. प्रभारी अधिकारी, वेर मंजरी रावत।
4. प्रभारी अधिकारी, मानव संसाधन।
5. प्रभारी अधिकारी, प्रशिक्षण सैल।
6. प्रभारी अधिकारी, आई0ई0सी0।

निदेशक, राष्ट्रीय रोग नियंत्रण केन्द्र (एन0सी0डी0सी0), स्वास्थ्य एवं परिवार कल्याण मंत्रालय, भारत सरकार के पत्रांक O.No. 67/CEOH/NCDC/2018-19/SAPCCHH दिनांक 26 मार्च, 2019 (संलग्न) द्वारा अवगत कराया गया है कि जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव एक गंभीर चिन्ता का विषय है। अतः आम जनमानस को इन दुष्प्रभावों से बचाने हेतु अतिशीघ्र हस्तक्षेप उपायों के करने की आवश्यकता है जिसके अन्तर्गत जलवायु परिवर्तन एवं अन्य सम्बन्धित पर्यावरण विषय जैसे वायु प्रदूषण, बढते तापमान के प्रत्यक्ष एवं अप्रत्यक्ष प्रभाव से रोगियों की संख्या एवं मृत्यु दर को कम करने में राज्य सरकार एवं सम्बन्धित स्वास्थ्य विभाग की महत्वपूर्ण भूमिका है।

उपरोक्त के क्रम में स्वास्थ्य एवं परिवार कल्याण मंत्रालय भारत सरकार के दिशा निर्देशानुसार जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव की रोकथाम हेतु उत्तराखण्ड राज्य में अधिशासी की अध्यक्षता में स्वास्थ्य विभाग एवं अन्य विभागों से विभिन्न विशेषज्ञों की एक Multi sectoral task force का गठन किया जाना है।

अतः उपरोक्तानुसार जलवायु परिवर्तन का मानव स्वास्थ्य पर पड़ने वाले दुष्प्रभाव की रोकथाम हेतु Multi sectoral task force में आपको सदस्य नामित किया जाता है।

संलग्नक : उपरोक्तानुसार।

भवदीय

(युगल किशोर पन्त) भा0प्र0से0
मिशन निदेशक
राष्ट्रीय स्वास्थ्य मिशन

Annexure 5: District Nodal Officers List

Sl. no	DISTRICT	NAME	PHONE NO.	Official E-mail
1	Almora	Dr. Kamlesh Joshi	9758042087	idspalmora02@gmail.com
2	Bagheshwar	Dr. Aakash	9410111007	idsp.bageshwar@gmail.com
3	Chamoli	Dr. Uma Rawat	9410134056	idspchamoli02@gmail.com
4	Champawat	Dr.Inedrajeet Pandey	8006691889	idspchampawat@gmail.com
5	Dehradun	Dr. Nidhi Rawat	9412046866	ntcp.ddun@gmail.com
6	Haridwar	Dr. Pankaj Jain	9412969502	idsphwr@gmail.com ncdharidwar@gmail.com
7	Nainital	Dr. Anuradha	9760410112	idsp.dsu.nainital1@gmail.com
8	Pauri	DR. Ramesh Kunwar	7500232844	ntcppauri@gmail.com
9	Pithoragarh	Dr. Hemant Martholia	7895672760	idsp.pithoragarh@gmail.com
10	Rudraprayag	Dr. Vimal Gussain	9411352351	idsprpg2021@gmail.com
11	Tehri	DR. Abhilasha	7895327108	ncdtehri.uk@gmail.com
12	US Nagar	Dr. Tapan Kumar Sharma	98371239984	idsp.usnagar2019@gmail.com
13	Uttarkashi	Dr. Vinod kukreti	6396538972	idsp123.uki@gmail.com

Annexure 6: IEC on Climate Sensitive Health Issues from Uttarakhand

लू से बचें!

गर्मियों में बाहर घूमने जाएं निम्न बातों का ध्यान रखें

- पीने का पानी/जूस साथ रखें और हाइड्रेटेड रहें
- पतले, ढीले सूती वस्त्र पहनें
- अपने सिर को छाते/टोपी/तौलिया आदि से ढक लें, ताकि धूप के सीधे संपर्क में आने से बचा जा सके
- नंगे पांव बाहर ना निकलें

जागरूक रहें, अपना ध्यान रखें!

NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन

उत्तर खण्ड शासन

National Programme on Climate Change and Human Health

"International Day of Clean Air for Blues Skies"
on 7th September 2022
"The Air we Share"

हवा प्रदूषित होने पर इसका सबसे बुरा प्रभाव पड़ता है इन पर

- 5 वर्ष से छोटे बच्चे
- गर्भवती महिलाएं
- बुजुर्ग लोग
- श्वसन रोग मरीज
- हृदय रोग के मरीज

सर्तकता ही बचाव है!

designed by IEC/ART/DG/NHM/05/09/22

National Programme on Climate Change and Human Health

State Climate Change & Human Health Unit,
National Health Mission,
Directorate of Medical Health & Family Welfare,
Uttarakhand


प्रदूषित वायु और गर्मी से करें बचाव, याद रखें ये सुझाव
समझदार बनिये
गर्मियों के खिलाफ छेड़ें जंग
अपने जीवन को बनाएं सुगम
लक्षण
उल्टी आना
बेहोशी
सिर दर्द
तेज बुखार
चक्कर आना
क्या करें
पर्याप्त तरल पदार्थों को लें।
तीव्र धूप को अन्दर आने से रोकें।
शरीर को ढकें एवं ढीले हल्के रंग के कपड़े पहनें।
दोपहर 12 से 4 बजे तक घर में ही रहें।
प्राकृतिक पेय पदार्थ जैसे जूस आदि का सेवन अधिक से अधिक मात्रा में करें।
STOP GLOBAL WARMING
क्या न करें
भारी कार्य जैसे कसरत इत्यादि न करें।
धूप में नंगे पांव न चलें।
दोपहर 2 से 4 बजे तक खाना पकाने से बचें।
शराब, चाय, कॉफी, साफ्ट ड्रिंक्स/कोल्ड ड्रिंक्स जैसे पेय पदार्थ का सेवन न करें।
अधिक जानकारी हेतु निकटतम स्वास्थ्य केन्द्र पर सम्पर्क करें।
National Programme on Climate Change and Human Health
इसके लिए बहुत सारे पेड़ लगायें
स्वास्थ्य संबंधी जानकारी/शिकायत हेतु
हेल्पलाईन नं. 104 पर सम्पर्क करें
घर बैठे चिकित्सक से स्वास्थ्य संबंधित परामर्श हेतु
esanjeevaniopd.in पर पंजीकरण करायें।
राष्ट्रीय स्वास्थ्य मिशन
नेशनल प्रोग्राम ऑन क्लाइमेट चेंज एण्ड ह्यूमन हेल्थ (एन०पी०सी०सी०एच०एच०)
राष्ट्रीय स्वास्थ्य मिशन, चिकित्सा स्वास्थ्य एवं परिवार कल्याण विभाग ऊधम सिंह नगर द्वारा जनहित में जानकारी