



स्वास्थ्य एवं  
परिवार कल्याण मंत्रालय  
MINISTRY OF  
HEALTH AND  
FAMILY WELFARE

सत्यमेव जयते



## RAJASTHAN

# STATE ACTION PLAN ON CLIMATE CHANGE AND HUMAN HEALTH



National Centre for  
Disease Control  
Government of India



National Programme  
on Climate Change  
and Human Health





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# **PART I**

## **Climate Change and its Health Impacts**





# CHAPTER 1

## Introduction



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

Climate change may negatively affect human health in several ways, but the most commonly experienced are increased frequency and intensity of heat waves leading to a 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 exacerbates cardio-respiratory and allergic diseases as well as certain cancers. Besides these, there is an increase in the 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 the “Rio Convention 1992”, “Kyoto protocol 1997”, “Male’ Declaration 1998”, “Convention of Parties”, “Cancun Agreement 2010”, “Durban Platform 2011”, and the “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 healthcare facilities should be prepared to address human needs in face of climate change-induced vagaries and adopt climate-resilient practices, particularly to encourage that these can withstand any climatic event and that essential services such as water, sanitation, waste management, and electricity are functional during such events. Further, for achieving climate resilience, 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.

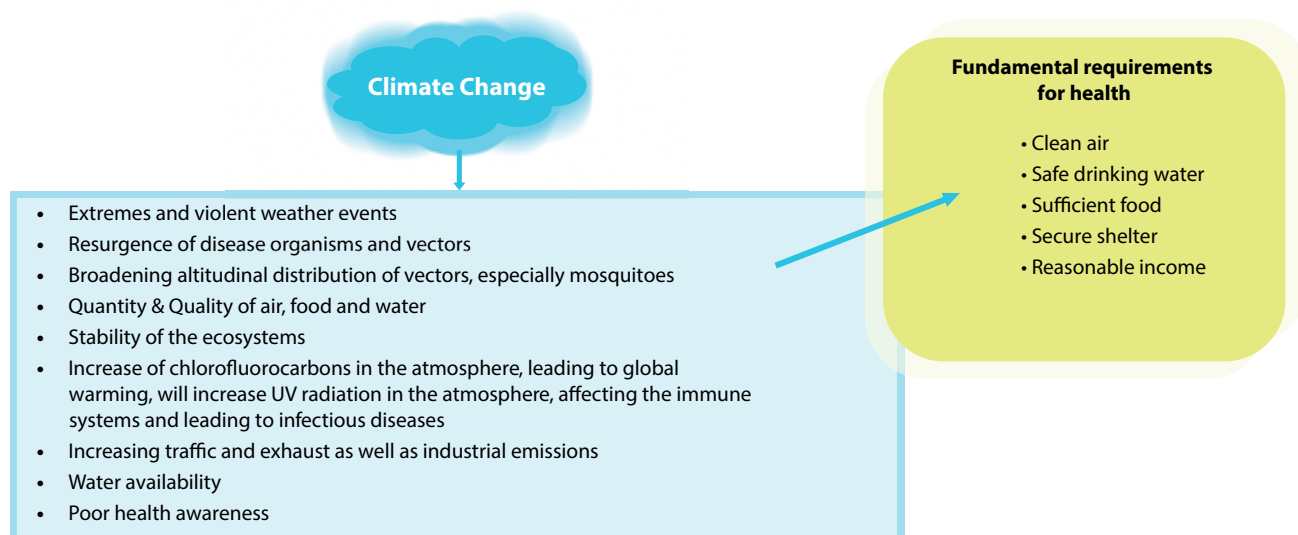
In this regard, initiatives undertaken by the Government of India include the identification of the Ministry of Environment, Forest & Climate Change (MoEF&CC) as the nodal ministry, the formulation of the National Environmental Policy 2006, and the formulation of the Prime Minister’s Council on Climate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

MoEF&CC has developed National Action Plan on Climate Change with eight missions. Later on, four new missions (including Health Mission) were identified. The Health Mission aims to reduce climate-sensitive illnesses through integration with other missions under the National Action Plan for Climate Change (NAPCC)

as well as through programmes run by various ministries. As a follow-up action, the Ministry of Health and Family Welfare (MoHFW) constituted a National Expert Group on Climate Change & Health (NEGCCCH) to prepare National Action Plan on Climate Change and Human Health (NAPCCCH) and recommend strategies for indicators, mitigation, capacity building, etc. for the health sector to respond to the climate emergency.

National Centre for Diseases Control (NCDC) is identified as the 'technical nodal agency' by MoHFW for the proposed National Mission on Health. The Centre for Environmental and Occupational Health Climate Change & Health (CEOH&CCH), NCDC, is implementing the National Programme of Climate Change and Human Health (NPCCHH), as a part of which State Action Plan on Climate Change and Human Health (SAPCCCH) has been prepared for Rajasthan. The 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.

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



With the establishment of the Department for Climate Change in 2022, Rajasthan state has demonstrated its resolve to respond to climate change and its impact early on. Since then, there are many initiatives taken in various sectors to adapt and mitigate the impact of climate change including the implementation of South Asia's first heat-health action plan with an early warning system.

This action plan outlines activities to be conducted under priority climate sensitive diseases.

1. Air Pollution related illnesses
2. Heat-related illnesses
3. Vector borne diseases
4. Disaster related health issues
5. Environmentally Friendly (Green) and Climate Resilient infrastructure

## CHAPTER 2

# Climate Vulnerability in the State



## Socio-demographic and health profile

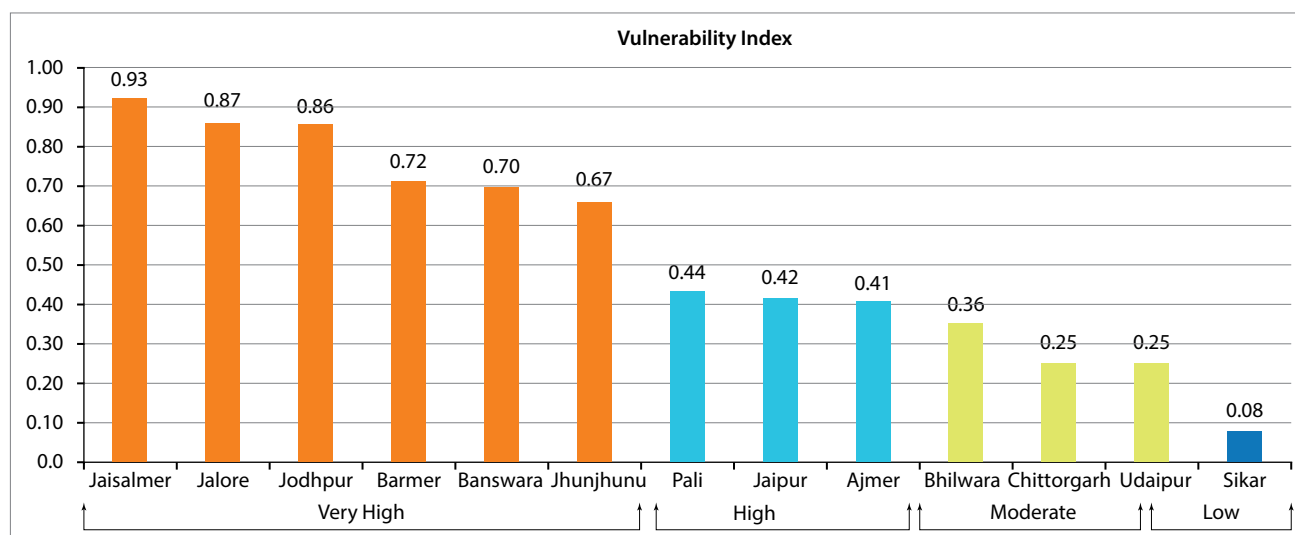
Rajasthan is the largest state by area, covering 3.42 lakh sq. km. It is the eight-most populous state with a population of 68.6 million as per 2011 census. It largely (53.5%) consists of working age adults (20- 49 years) with sex ratio of 928 females per 1,000 males.

About 98.10% have electricity as per National Family Health Survey-5 (2019-21). About 96.5% of households use an improved source of drinking water, and 71.1 households that use an improved sanitation facility.<sup>1</sup> Majority of households (41.4%) in Rajasthan use a clean fuel for cooking.

The state has reported higher burden of ischemic heart diseases and COPD were leading causes of Disease Adjusted Life Years (DALY). Highest DALY was attributable to risk factors like malnutrition, air pollution, dietary factors and high blood pressure. Climate change and air pollution may increase burden of such non-communicable disease.<sup>2</sup>

## Climate change and health

The state falls in the subtropical climate zone and has an arid climate in western Rajasthan, semi-arid in western north Rajasthan, Sub-humid in central Rajasthan, Humid in east Rajasthan and Very humid in south Rajasthan. The summer temperature varies between 25°C and 45°C, while the winter temperature ranges



between 10°C and 27°C. The normal monsoon season runs from June to September, with a normal annual rainfall of 488 mm<sup>3</sup>.

Rajasthan is one of the moderately vulnerable states to climate change impacts in India based on its socio-demographic, biophysical, and institutional-infrastructure aspects (Figure 1)<sup>4</sup>

Climate vulnerability ranking of districts based on its socio-demographic, biophysical, and institutional-infrastructure aspects, Rajasthan, 2021 According to this assessment, Jaisalmer has high relative vulnerability among districts. However, health impact specific vulnerability assessment should be considered for better understanding of burden of climate sensitive diseases and prioritization of action. Among climate sensitive health issues, air pollution, heat-related illnesses, extreme weather events, vector-borne, food and water-borne diseases, nutrition related impacts, coastal impacts, environmentally sustainable and climate-resilient health care facilities are relevant aspects for health sector strengthening in the state.

## **Rainfall Variation**

Historical data for the state shows that in Western Rajasthan, the average rainfall ranges from less than 100 mm to over 400 mm whereas in Eastern Rajasthan, the rainfall ranges from 220 mm to 1020 mm. In plains districts of Banswara and Jhalawar and in the Southwest region, Mount Abu in Sirohi district receives the highest rainfall.

High variability is associated with the annual averaged rainfall spatially and is the most erratic in the western region with frequent dry spells, with occasionally heavy downpour.

The regional model estimates the mean annual rainfall to decrease slightly, but the extreme rainfall is expected to increase in frequency and intensity. 2071-2100 projections show an increase of 20 mm for maximum 1-day rainfall and 30 mm for maximum 5-day rainfall.

## **Extreme Climate: Droughts and Floods**

Observational records show that for over 100 years, the probability of occurrence of severe and very severe droughts is high over the Western Rajasthan region. In spite of receiving high average rainfall, the Southern districts of Rajasthan have also experienced large number of severe droughts in the past.

Many places in Rajasthan have witnessed flash floods due to heavy rainfall events. Floods in July 1981 in Jaipur, Tonk, Nagaur and in 2006 over Barmer are few examples. All these floods have resulted in unprecedented loss of lives and property. Due to heavy rain downpour, flooding in rivers have been also observed over the state. Dholpur flood in Aug., 1982 is an example of flooding due to river Chambal.

## **Temperature Variation**

The historical data (past 100 years) analysis for extreme weather events indicates Rajasthan to be the second state after Jammu and Kashmir where maximum number of cold waves have occurred.

A gradual decreasing trend in mean annual temperature for North West region over India has been observed during the southwest monsoon season in the past.

High resolution regional model projections for 2071-2100 have predicted an increase in annual mean surface temperature for all parts of India with an increase of 2-4°C for the state of Rajasthan.

## Health Sector Response to Climate Change in Rajasthan State

### Rajasthan state Health infrastructure

Rajasthan has a network of public and private health care facilities. There have been efforts to expand and update public health infrastructure in recent years. Need for concentrated efforts in disaster vulnerability of health facilities and implementation of resilient measures is realized.

#### Public health infrastructure in Rajasthan

Sl. No.	Health Facility	Quantity
1	Medical colleges	16 Functional and 14 in process
2	District hospitals	43
3	Satellite Hospitals	11
4	Sub-district hospitals	43
5	Community Health Centres	759
6	Primary Health Centres	2257
7	Urban Primary Health Centres	57
8	Sub-centres	14272

Rajasthan has placed considerable emphasis on empowerment of village level institutions through extensive capacity building and proactive facilitation. The creation of Water and Sanitation Management Organization (WASMO) has successfully been able to bring effective citizens' engagement through its innovative governance model, for facilitating the community led water supply programme throughout the State of Rajasthan.

The vulnerabilities that climate variability and change create are key issues in the economic and social development of the State. Although, there are studies on climate trends and projections for the Indian region, few focused on the State. Available observational evidence indicates that regional changes in climate, particularly increases in temperature, have already affected a diverse set of physical and biological systems. There is a need to study systematically the inter-relationship between Climate Change impacts to derive effective adaptation and mitigation measures.

Identified 10 components provide a comprehensive approach to integrating climate resilience into existing health systems:

1. Leadership & governance
2. Capacity building on climate change and health
3. Vulnerability and adaptation (V&A) assessments
4. Integrated risk monitoring and early warning
5. Climate resilient and sustainable technologies and infrastructure

6. Research to reduce uncertainty on local conditions, gain insight into local solutions and capacities, and build evidence to strengthen decision-making
7. Management of environmental determinants of health
8. Departments and programs that can become climate-informed
9. Managing changing risks of climate extremes and disasters and lastly
10. Climate and Health financing

## CHAPTER 3

# Climate Sensitive Issue/ Diseases Prevalent in the State



## 1. Air pollution

Particulate air pollution is the single greatest threat to human health. Population in Rajasthan may be exposed to 40-103 $\mu\text{g}/\text{m}^3$  population-weighted mean ambient  $\text{PM}_{2.5}$  concentration and 60-69.9 ppm of Ozone concentration<sup>5</sup>. According to National Clean Air Program, there are three non-attainment cities as per national ambient air quality standards of Rajasthan —Alwar, Jaipur, Kota, Udaipur and Jodhpur. Current annual safe limits for  $\text{PM}_{2.5}$  and  $\text{PM}_{10}$  are 40 $\mu\text{g}/\text{m}^3$  and 60  $\mu\text{g}/\text{m}^3$ .

### Annual Pollutant Levels in NCAP cities, other industrial/metro cities, Rajasthan

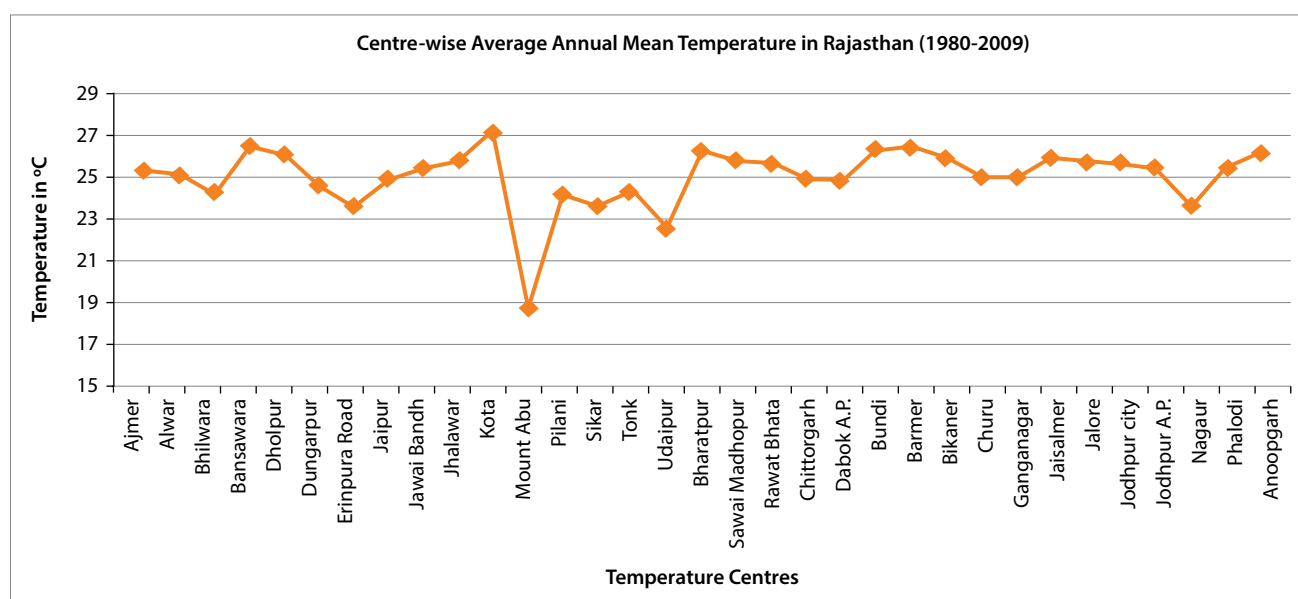
District	Status	AQI-US	$\text{PM}_{2.5}$	$\text{PM}_{10}$	Temp	Humid
Kota	Poor	176	103	166	22	32
Bhilwara	Poor	166	84	168	22	32
Bhiwadi	Poor	165	83	249	18	83
Ajmer	Poor	160	73	179	26	24
Jodhpur	Poor	158	69	168	26	36
Tonk	Poor	158	70	137	27	26
Chittaurgarh	Poor	157	67	138	22	32
Jaipur	Poor	156	66	136	27	26
Pali	Poor	156	67	154	28	32
Pushkar	Poor	156	65	149	26	24
Bikaner	Poor	154	61	153	26	21
Sikar	Poor	139	51	116	27	26
Alwar	Poor	137	62	111	26	17
Jaisalmer	Poor	137	51	126	26	31
Udaipur	Poor	135	52	110	26	31
Jalor	Poor	107	38	92	26	31
Bharatpur	Poor	102	36	145	18	29
Abu	Moderate	80	26	59	26	31



Based on PM<sub>2.5</sub> levels reported in 2020, potential average gain in life expectancy is estimated to be 3.1 years from reducing PM<sub>2.5</sub> to the WHO Guideline (5 µg/m<sup>3</sup>)<sup>7</sup>.

## 2. Extreme heat

Exposure to extreme heat can lead to various heat-related illnesses (HRI), from mild (prickly heat) to fatal (heatstroke) manifestation. It also increases cardiovascular, respiratory, renal, and all-cause mortality along with increases in ambulance calls and admissions. Increasing anthropogenic climate change is expected to intensify heat waves over India.



**Temperature:** The State of Rajasthan has distinct temperature range variations (diurnal and seasonal) throughout the state. The summer season begins in the month of March and the temperature keeps rising progressively through April, May and June. The maximum daily temperature hovers around 40°C to 45°C in the regions of **Bikaner, Phalodi, Jaisalmer and Barmer**. Frequently, the temperature soars to as high as 49°C during the summer months. Nights of summers see a considerable temperature fall with a minimum daily temperature around 20°C to 29°C. The regions of Udaipur and Mount Abu have a pleasanter summer with relatively lower daily maximum temperature that varies around 38°C and 39.5°C. **The major portion of the state in the arid west and the semi-arid regions has an average maximum of 45°C during summer.**

## 3. Vector-borne diseases

All the VBDs are climate sensitive as the pathogens have to complete a part of their development in particular species of the insect vector that transmit them. The temperature, rainfall and relative humidity (RH) affect the development of vectors.



## Major mosquito-borne diseases reported through National Vector-Borne Disease Surveillance in Rajasthan, 2020-22

Year	Malaria		Dengue		Chikungunya
	Cases	Death	Cases	Death	Cases
2020	1276	0	2023	7	1015
2021	925	0	20141	62	1044
2022	1508	0	12310	9	180

Source: Institute for Environmental Analytics

## 4. Extreme weather events (EWE)

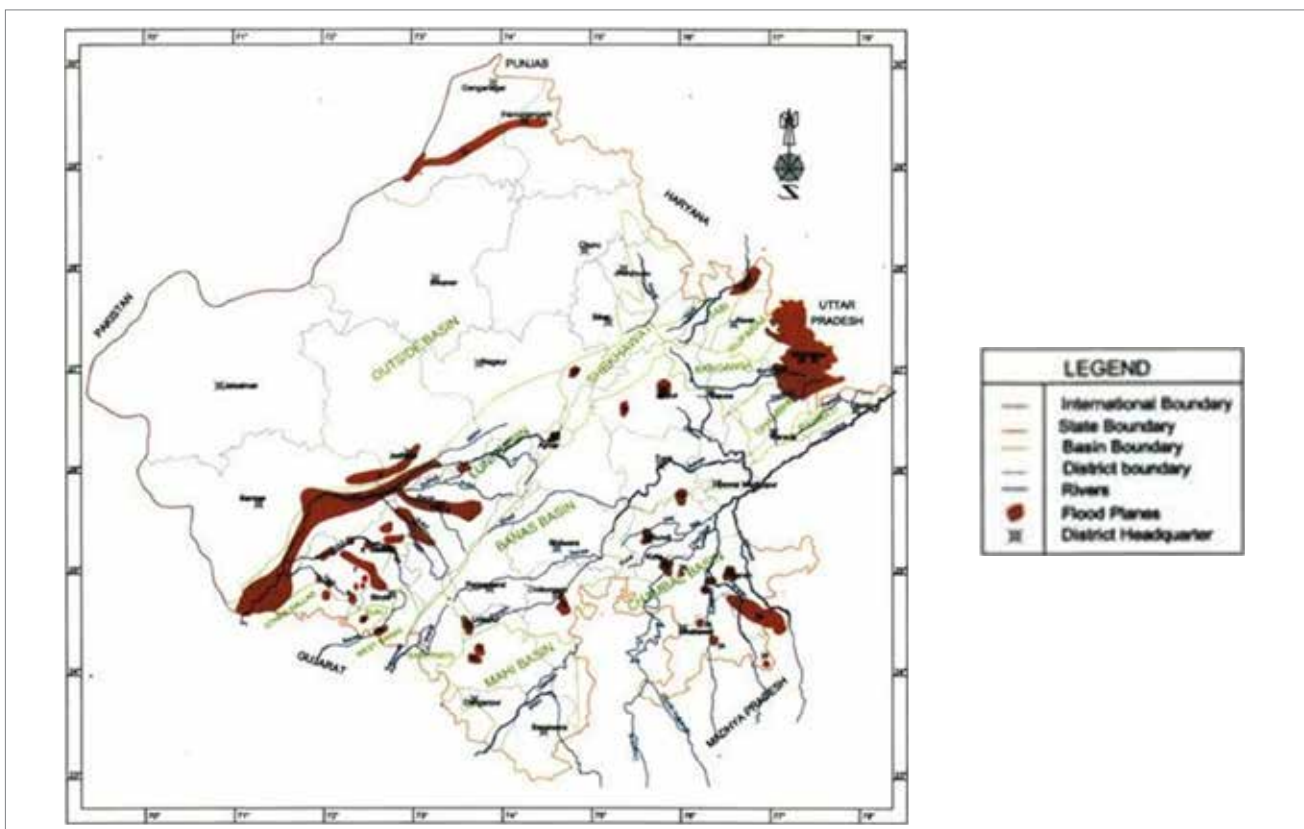
Rajasthan, due to its geo-climatic, geological and physical features, is vulnerable to all major natural hazards, apart from heat wave, like drought, flood, cyclone, cold wave, earthquake, tsunami etc.

### Floods

India is highly vulnerable to flooding. Increasing instances of localized heavy rainfall interspersed with dry spells and changing monsoon pattern due to climate change is increasing instances of such extreme weather events and concurrent flash floods, riverine and urban flooding.

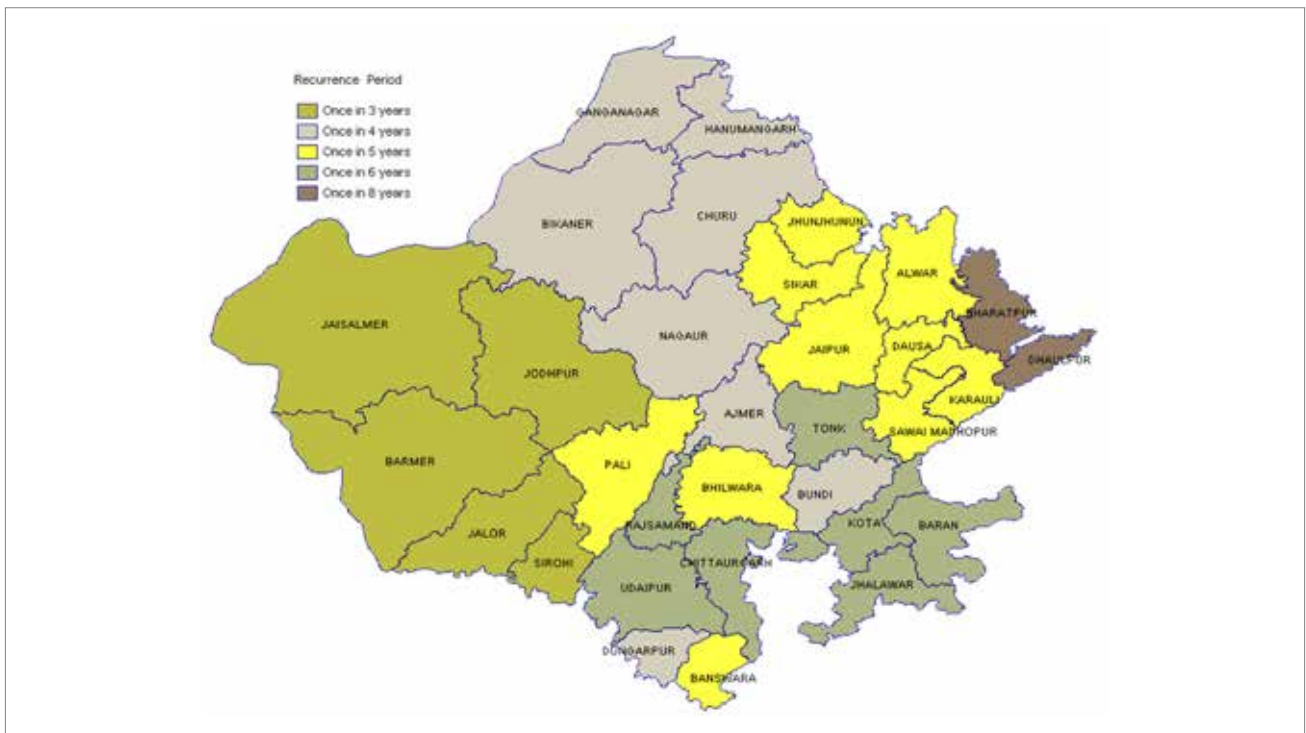
The districts comprising these river basins (**Ajmer, Alwar, Bharatpur, Baran, Bundi, Barmer, Chittorgarh, Jalore, Jodhpur, Jaipur, Jhalawar, Pali, Sirohi, Nagaur, Udaipur and Hanumangarh**) have high flood potentiality.

### Flood hazard risk zones, Rajasthan (GSDMA)



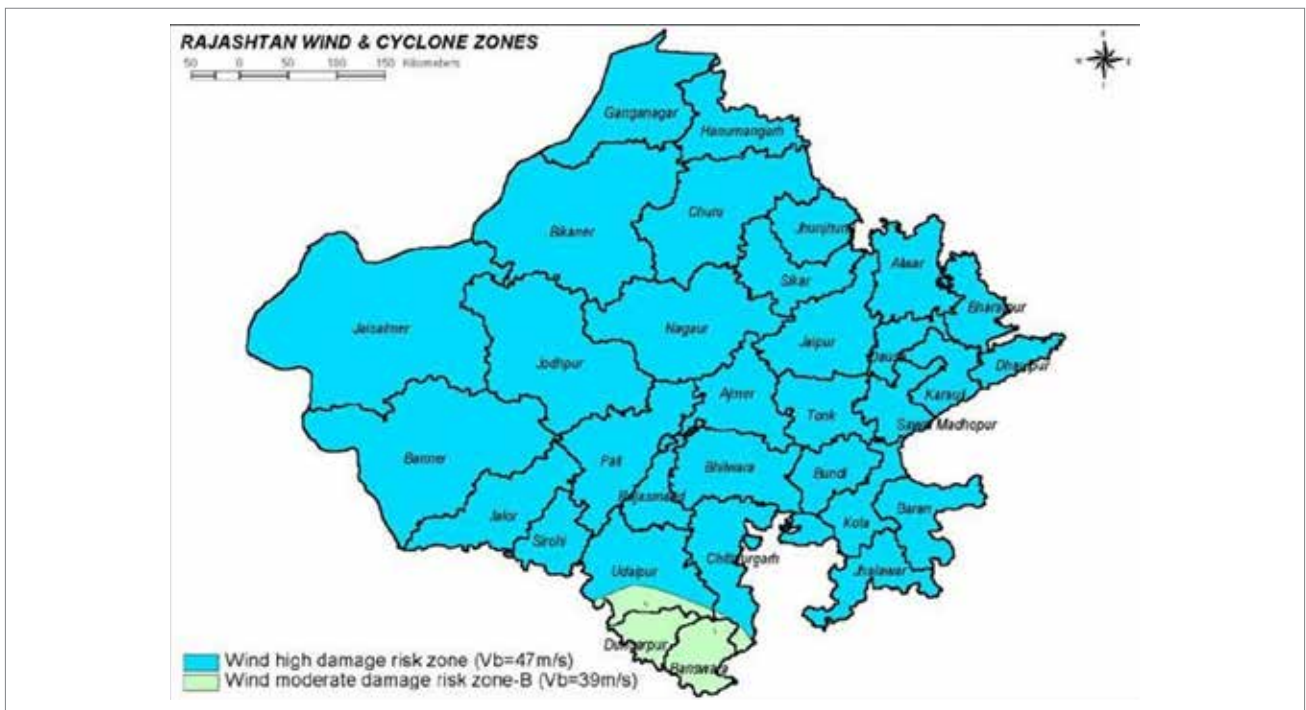
## Drought

### Drought hazard risk zones, Rajasthan



## Cyclone

### Cyclone and Storm Surge hazard risk zones, Rajasthan



## Cold Wave

Rajasthan is one of the cold wave prone states. Although frequency of cold wave has changed over time, it poses a health threat to vulnerable population.

## CHAPTER 4

# Vision, Goal and Objectives



**Vision:** Strengthening of healthcare services for all the citizens of the state especially vulnerable population 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 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 impacts of climate change on human health.

**Objective 2:** To strengthen the 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 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 Meghalaya 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.

Current and Future Priorities of Rajasthan state in upcoming years (2023-2027):

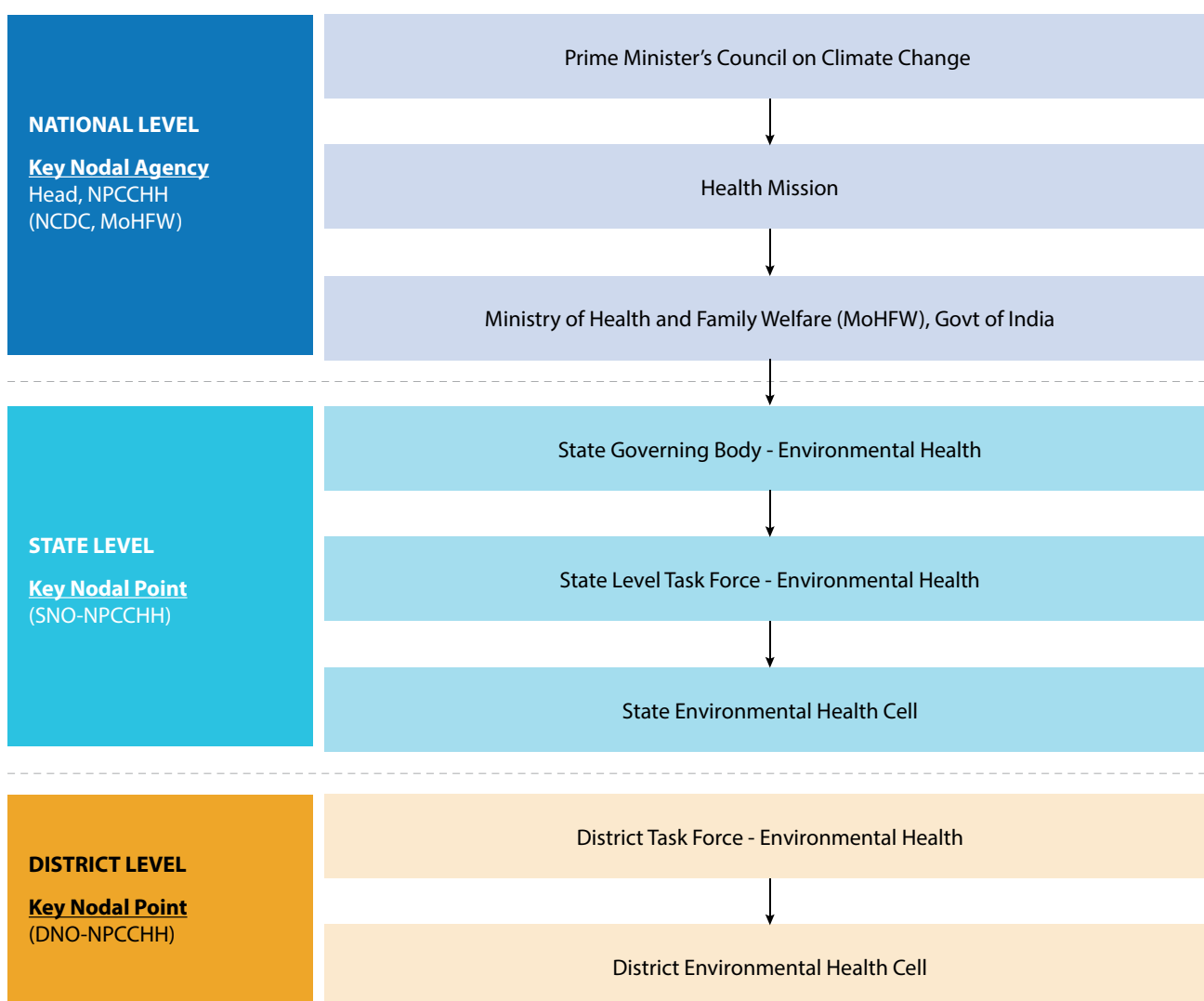
1. Awareness Generation among the population especially vulnerable communities
2. Health-Care Providers & Policy Makers Regarding Impacts of Climate Change on Human Health.
3. Capacity Building of Government and Private Healthcare System to Reduce Illnesses/Diseases Due to Variability In Climate
4. Health Sector Preparedness and Response Including District Level
5. To Develop Partnerships and Create Synchrony/Synergy with Other Missions, Departments and Programmes to Steer Research on Climate Change and Health

## CHAPTER 5

# Organisational Structure



### ORGANISATIONAL STRUCTURE



## A. Rajasthan State Governing Body for NPCCHH

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

Honorable State Health Minister	Chairperson
Principal Secretary (Medical & Health)	Vice Chairperson
Mission Director-National Health Mission	Member
Director (Public Health)	Member
Additional Director (Medical Education)	Member
Additional director (Hospital Administration)	Member
Additional director (Rural Health)	Member
Joint Director (Hospital Administration)	Member Secretary
Regional Director-Health & Family Welfare	Member

## B. Rajasthan State Task Force for NPCCHH

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) in their state/UT. It shall be working through Directorate of Health Services (DHS) of the state, which will be the implementing agency for SAPCCHH.

### Members of State Task Force, Rajasthan

Principle Secretary (Medical & Health) Rajasthan State	Chairmen
Mission Director, National Health Mission Rajasthan	Member
Director (Public Health)	Member
Additional Director (Medical Education)	Member secretary
Additional director (Hospital Administration)	Member
Chief Engineer (PHED)	Member
Director, Indian Meteorological Department, Jaipur	Member
Chairperson, Rajasthan Pollution Control Board, Jaipur	Member
Chairperson Rajasthan State Disaster Management Authority, Jaipur	Member
Ex Engineer/Scientist, Forest & Environment Department, Jaipur	Member
Ex Engineer/Scientist, Ground Water Department Jaipur	Member
Director, Animal Husbandry Department Jaipur	Member
Joint Director (Hospital Administration)	Member
Deputy Director (Malaria)	
Technical advisor Climate change Jaipur	Member
State surveillance Officer IDSP Jaipur	Member

## Official orders of following are attached as Annexures

1. State Task force Notification of Rajasthan
2. State Environmental Health Cell, Task Force and Surveillance notification, Rajasthan
3. State Task Force Meeting in 2023
4. District Task force Notification Current DNO list Name with contact details

## Roles and responsibilities of State Task Force

1. Establish organizational structure for implementation of programme activities at state
2. Preparation and Implementation of State Action Plan for Climate Change and Human Health (SAPCCHH)
3. Facilitate implementation of activities at district, sub-district and community level
4. Assessment of needs for health care professionals (like training, capacity building) and organise training, workshop and meetings.
5. Establish/coordinate surveillance of Acute Respiratory Illness in context of Air Pollution and Heat-related illness surveillance
6. Ensure Convergence with NHM activities and other related programs in the State and District
7. Maintain State and District level data on physical, financial, epidemiological profile for climate sensitive illnesses
8. 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)
9. Monitor programme, Review meetings, and Field observations.
10. Social mobilization against preventive measures through involvement of women's self-help groups, community leaders, NGOs etc.
11. Advocacy and public awareness through media (Street Plays, folk methods, wall paintings, hoardings etc.)
12. Encourage and implement Green/environmentally friendly and resilient measures and infrastructures in health care sector
13. Conduct Vulnerability assessment and risk mapping for commonly occurring climate sensitive illnesses in the state/UT.

## Rajasthan State Environment Health Cell (EHC)

Rajasthan state's EHC comprises of following member

### Members of Environmental Health Cell, Rajasthan, 2023

Sl. No.		Name	Contact detail
1	<b>State Nodal Officer</b>	Dr. R.N. Meena	9413923136
2	<b>State Surveillance Officer</b>	Dr. Rajesh Sharma	9460525632
3	<b>Data entry operator</b>	Shri Hari Shankar	9461485640



# **PART II**

## **Health Action Plans on Priority Climate Sensitive Health Issues**





## CHAPTER 6

# Health Action Plan on Air Pollution Related Diseases



Air pollution is a major environmental risk to health. The formation, transport, and dispersion of many air pollutants are determined partly by climate and weather factors such as temperature, humidity, wind, storms, drought, and precipitation and by human activities like industrialization, construction and demolition activities, vehicular pollution, episodic crop residue burning, etc. known to produce various air pollutants. Air pollution is also associated with acid rain, and eutrophication due to nitrogen oxide emission in the air from power plants, cars, trucks, and other sources, haze, toxic effects on wildlife, ozone depletion in the atmosphere, crop, and forest damage, etc.

The health risks due to air pollution are associated with exposure to high levels of particulate matter (PM), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>), etc. Air quality levels in an area are collectively communicated to the public as Air Quality Index (AQI). The particulate matters of less than 10 and 2.5 micrometers (PM<sub>10</sub> and PM<sub>2.5</sub>) are capable of penetrating deep into the airway passages, entering the bloodstream, causing illnesses from acute and chronic respiratory systems, increase in malfunction of the other organs affecting the health of cardio-cerebrovascular renal diseases, and among pregnant females due to trans-placental crossing of pollutants affect foetus resulting in low birth congenital problems and associated complications.

## Causes of air pollution

### Ambient Air Pollution

- ▶ Pollution by automobiles
- ▶ Industrial Emission
- ▶ Tourism related activities
- ▶ Fisheries/Agriculture & related activities
- ▶ Mining and related activities

### Indoor Air Pollution

- ▶ Use of biomass, kerosene as fuel for cooking
- ▶ Burning of waste, cow dung, and coal in villages
- ▶ Tobacco smoke/cigarettes/beedi/hookah/recreational uses
- ▶ Mosquito coil/candles/incense

Ambient (outdoor) air pollution in both cities and rural areas was estimated to cause approximately 7 million deaths worldwide, and 90% of these deaths have occurred in low and middle-income countries. In India, nearly 12.5% of deaths have been attributed to air pollution. An ICMR report concluded that Outdoor Air Pollution caused 6.7 lakh premature deaths, while Indoor Air Pollution caused 4.8 lakh premature deaths in 2017. Thus, it is logical to assume that a reduction in air pollution levels can help reduce the burden of diseases like acute and chronic respiratory diseases, heart diseases, strokes, and other allergic problems.

The quality of air is expressed by Air Quality Index (AQI) which is broadly categorized into six levels, i.e. Good, Satisfactory, Moderately Polluted, Poor, Very Poor, and Severe to communicate and help understand the AQI as well as the associated health problems.

## Health Adaptation Plan

The major components of the health action plan on air pollution and health are mentioned below:

### 1. Awareness Generation

#### Information, Education Communication (IEC) Activities

To increase general awareness amongst all the relevant stakeholders including the general population especially vulnerable communities, health care providers, and policy makers regarding the impacts of air pollution on human health, the state has developed information, education and communication (IEC) communicating messages for preventable actions and seeking medical support using multiple communication materials such as posters, audios, videos, and organizing public health events.

#### i. Target population

**Urban areas** (Primarily Jaipur, Alwar, Kota, Udaipur and Jodhpur Municipal corporations)

**Industrial areas** (like Nimbrana, Bhewari, Kota),

**Vulnerable groups** (Primarily Children, women, older adults, traffic police, outdoor workers)

#### ii. Annual IEC dissemination plan for Air Pollution and Health under NPCCHH, Rajasthan

IEC type	Material	Timeline	Mechanism
<b>Advisory</b>	NPCCHHPrg	September	By email to DNO for further dissemination to health facilities
<b>Early warning</b>	AQI level with health risk category	September- March (Priority) Year around (Ideally)	<ul style="list-style-type: none"> <li>Digital display on public places and health facilities</li> <li>Newspaper</li> <li>Health department/other government website/application</li> </ul>
<b>Posters</b>	<ul style="list-style-type: none"> <li>12 posters on Air Pollution and health impacts (Hindi)</li> <li>3 posters on Air Pollution and health impacts (Hindi) NPCCHHIEC</li> <li>Posters on Air Pollution and health impacts (Hindi)</li> </ul>	September-October	<ul style="list-style-type: none"> <li>Printing for state-level dissemination at health facilities, public places/buildings</li> <li>By email to DNO for printing at district level and dissemination to health facilities, schools and other public/government buildings</li> </ul>

IEC type	Material	Timeline	Mechanism
<b>Wall painting</b>	<ul style="list-style-type: none"> <li>Using available material</li> </ul>	Painted in August-September	<ul style="list-style-type: none"> <li>In schools and selected colleges</li> <li>In health facilities</li> </ul>
<b>Hoardings</b>	<ul style="list-style-type: none"> <li>Posters in Hindi (above)</li> </ul>	September	<ul style="list-style-type: none"> <li>To be planned with Jaipur, Alwar, Kota, Udaipur and Jodhpur</li> <li>Municipalities</li> </ul>
<b>Audio-Visual</b>	<ul style="list-style-type: none"> <li>3 Audio Jingles (Hindi) bit.ly/NPCCHHIEC</li> <li>1 Audio Jingle (Hindi)</li> </ul>	September	<ul style="list-style-type: none"> <li>Played 3 times a day during between September to March</li> </ul>
	<ul style="list-style-type: none"> <li>2 Video messages (Hindi) NPCCHHIEC</li> <li>1 Video message (Hindi)</li> </ul>		<ul style="list-style-type: none"> <li>Played 3 times a day during between September to March</li> </ul>
<b>Bus painting</b>	<ul style="list-style-type: none"> <li>Using available material</li> </ul>	Painted in August-September	
<b>Digital display</b>	<ul style="list-style-type: none"> <li>4 GIF NPCCHHIEC</li> <li>Above mentioned video messages</li> </ul>	August- September	<ul style="list-style-type: none"> <li>Display in health facilities</li> <li>Public digital display boards in major cities</li> </ul>
<b>Social medial</b>	All above material + Relevant activity updates	Throughout the year	<ul style="list-style-type: none"> <li>Facebook and Twitter handle of state NPCCHH, NHM</li> <li>WhatsApp groups (State DNO, Health facility group)</li> </ul>

### iii. Preparatory work for IEC dissemination by EHC

Nodal agency and person	
<ul style="list-style-type: none"> <li>Hindi translation of existing print material English material</li> <li>Designing of new print material</li> <li>Printing</li> <li>Audio-video spot booking</li> </ul>	<ul style="list-style-type: none"> <li>State Environment health cell/IEC department: Dr. Naim Ghanchi Contact No. 9773050763</li> </ul>

### iv. Observance of important environment-health days for air pollution and health related activities

Day	Activities
International Day of Clean Air for Blue Skies (September 7) <b>Other days</b> <ul style="list-style-type: none"> <li>World Car Free Day (September 22)</li> <li>World Environmental Health Day (September 26)</li> <li>Green Consumer Day (September 28)</li> </ul>	<b>IEC Campaigns</b> <ul style="list-style-type: none"> <li>Health facility-based patient awareness sessions</li> <li>Audio-video spots broadcasting</li> <li>Targeted awareness sessions: traffic police, schools, women, children</li> <li>Street plays and local cultural activities, Rallies</li> <li>Sports events</li> <li>Competition: poster, poem/essay, quiz</li> </ul>

## 2. Capacity Building Activities

### i. Training material

**Guidelines:** (available [bit.ly/NPCCHHguidelines](https://bit.ly/NPCCHHguidelines))

- ▶ Health Adaptation Plan for Disease Due to Air Pollutions
- ▶ Health Sector Preparedness for Air Pollution
- ▶ Handbook for Health Professionals on Air Pollutions & Its Impact on Health

**Training modules:** (available [bit.ly/NPCCHHguidelines](https://bit.ly/NPCCHHguidelines))

- ▶ Women Training Manual (English, Hindi)
- ▶ Children Training Manual (English, Hindi)
- ▶ Traffic Police Training Manual (English, Hindi)
- ▶ Municipal Worker Training Manual (English/Hindi)

**Other training resources:** NPCCHHchannel <https://bit.ly/NPCCHHyt>

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

For State Institute of Health & Family Welfare

Contact person designation: Dr O.P.Thakan, Director (SIHFW), Jaipur Contact detail -8769575056

Training on Air pollution related diseases may be expanded to include other climate sensitive diseases specifically cardio-pulmonary and allergic diseases.

### iii. Annual training plan for Air Pollution and Health under NPCCHH, Rajasthan

Training Programme for	Trainer	Topics	Timeline
<b>District level</b> (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	<ul style="list-style-type: none"> <li>• Air pollution-health impact, prevention measures</li> <li>• Surveillance reporting and analysis with AQI</li> <li>• Health facility preparedness</li> </ul>	August-September
<b>Health facility level</b> (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	<ul style="list-style-type: none"> <li>• Air pollution-health impact, prevention measures</li> <li>• Surveillance case identification and reporting</li> <li>• Health facility preparedness</li> </ul>	August-September December-January (review/repeat)
<b>Community Health care workers</b> (MPH, ASHA, ANM etc)	State & District Trainers	<ul style="list-style-type: none"> <li>• Surveillance case identification and reporting</li> </ul>	August-September December-January (review/repeat)
<b>Panchayati Raj Institutions</b>	District Level Trainers, MO	Air pollution-health impact prevention	September-October
<b>District level</b> (DNO-CC, trainers)	District level trainers, MO, Health care workers	Air pollution-health impact prevention	September-February

### 3. Strengthening Health Sector Preparedness

#### National Outdoor Air and Disease Surveillance (NOADS)

##### i. Surveillance guidelines

Health Adaptation Plan for Disease Due to Air Pollutions <https://bit.ly/NPCCHHNOADS>

There are **three Non-Attainment Cities** identified under National Clean Air Programme (2018)

- ▶ Jaipur
- ▶ Alwar
- ▶ Kota
- ▶ Udaipur
- ▶ Jodhpur
- ▶ 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.

##### ii. Sentinel surveillance sites-NCAP and other urban areas under NOADS, NPCCHH in Rajasthan

Sl. No.	Sentinel Sites	District	Hospital Nodal Person
1		Jaipur	
2			
3			
4		Alwar	
5		Kota	
6		Udaipur	
7		Jodhpur	

**iii. Surveillance training:** included under capacity building section

**iv. Surveillance activity monitoring:**

- ▶ Review with DNO: Quarterly
- ▶ Review with Hospital nodal officer: Monthly

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

## Roles and Responsibilities

	Responsibilities
<b>SNO</b>	<ul style="list-style-type: none"> <li>Finalization of IEC material and dissemination Plan</li> <li>Organize IEC campaigns at state level on observance of important environment- health days</li> <li>Organize training sessions for district level and surveillance nodal officer</li> <li>Facilitate training of medical officers in clinical aspects of air pollution's health impact</li> <li>Real time air quality data dashboard in Proposed cities</li> <li>Monitor AQI levels in states especially in hotspots and NCAP cities</li> <li>Ensure reporting from sentinel hospitals and DNO</li> <li>Ensure necessary health facility preparedness</li> <li>Review surveillance reporting and monthly report submission by DNO</li> <li>Submit report of activities</li> <li>Review implementation of IEC and surveillance activities at all levels</li> <li>Evaluate and update relevant section of SAPCCHH with support from State Task Force</li> <li>Liaison with State Pollution Control Board for AQI alerts and its dissemination</li> <li>Liaison with Department of Environment for combined IEC campaigns and information sharing on health indicators for targeted air pollution reduction activities</li> <li>Awareness and action plan input sharing with Ahmedabad Municipal corporation, Vadodara Municipal corporation and Surat Municipal corporation</li> <li>Create organization support and strengthen Environmental Health cell to implement NPCCHH vision, Goal and Objectives</li> <li>Organize sensitization workshops for other stakeholders and line departments</li> <li>Organize Seminars on Air Pollution and Conference to share knowledge and action under NPCCHH.</li> <li>Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, vulnerability assessment and applied research</li> <li>Advocate for reduction in source of air pollution</li> </ul>
<b>DNO</b>	<ul style="list-style-type: none"> <li>Ensure IEC dissemination to community level</li> <li>Facilitate community level IEC activities</li> <li>Conduct training for Block health officers, Medical officer, Sentinel hospital nodal officers with relevant training manuals</li> <li>Conduct training of vulnerable groups: police officers, outdoor works, women, children</li> <li>Organize IEC campaigns at district level on observance of important environment- health days</li> <li>Collect and monitor AQI levels in states especially in hotspots and NCAP cities</li> <li>Ensure daily reporting from Sentinel hospitals and compile the data</li> <li>Analyze daily health data with AQI level to monitor trends and hotspot in health impacts</li> <li>Submit analyzed monthly report to SNO, NPCCHH, Hq and other departments for necessary action</li> <li>Submit report of activities</li> <li>Update DAPCCHH with support from District Task Force</li> <li>Advocate for reduction in source of air pollution</li> </ul>
<b>Surveillance hospital nodal officer</b>	<ul style="list-style-type: none"> <li>Train hospital staff and clinician responsible for daily reporting in case indentation and reporting flow</li> <li>Compile daily reports for the health facility and submit it to DNO and NPCCHH, Hq</li> </ul>

	Responsibilities
<b>Block health officer</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> <li>• Ensure training of medical officers</li> <li>• Organize PRI sensitization workshop and training for vulnerable groups</li> </ul>
<b>Medical officer</b>	<ul style="list-style-type: none"> <li>• Conduct health facility-based IEC activities</li> <li>• Support community level IEC activities</li> <li>• Be aware of AQI levels and health impact of air pollution</li> <li>• Ensure necessary health facility preparedness in early diagnosis and management of cases</li> <li>• Community mobilization for reduction in greenhouse gas emissions, and local pollution</li> </ul>
<b>Panchayati Raj Institutions</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> <li>• Community mobilization for reduction in greenhouse gas emissions, and local pollution</li> </ul>

## CHAPTER 7

# Health Action Plan on Heat Related Illnesses



Heat waves is one of the biggest issues facing the world today it is not a new phenomenon in the Earth's history. It is one of the most seen reaction of Climate Change. Climate Change refers to a significant variation in either the mean state of the climate or in it's variability, persisting for an extended period, typically, decades or longer. Climate change scenario has notable detrimental effects such as drought resulting into food insecurity and increased malnutrition, migration and diminished water resources etc. Studies indicate that the decade (2007-2017) across the globe recorded the warmest years during the past century, the three years viz. 2015, 2016 and 2017 recorded warmer conditions, increasing in sequence. It is predicted that by year 2099 earth average temperature will rise 3-6 degree C, which will lead to many more severe heat waves.

### Situational analysis

As per census 2011, the area of Rajasthan state 3,42,239 sq. km and the total population is 6.86 crores (5.66 percent of Indian population). Out of which more than 2/3<sup>rd</sup> people live in rural part. Thar' desert area consists of 12 districts covering, 60 percent area of the state and 40 percent of the entire state population. Rajasthan contributed 9.1percent of India's total livestock emissions. In the matter of transport, as total number of the registered vehicles has increased in the state by six times from 1990 to 2009 (GoR 2010c).

A rapid situational analysis for understanding community perspective, specific need and gaps has been carried out. In assessment it has been found that only 27 percent respondents were aware about what is climate change. The study carried out was a cross- sectional survey of residents of these two blocks. A total of 150 households were selected randomly and survey completed by a structured questionnaire. This was supplemented with 10 key informant interviews (KIIs) and some informal talks.

Overall, 98.33 percent of the respondents reported that the heat during the summers had increased and 96.66 percent reported that rainfall pattern had changed, 83.33 percent reported that ground water level gone down, 85.33 percent stated decrease in crop production compared to previous experience. Only 8.66 percent respondent were looking for weather forecast daily and almost 50.66 percent never looked for any weather forecast. KIIs and informal talks also reported that summers and winters were warmer than previous years.

The concept of "Climate Change" is relatively new in rural areas although they had clear perceptions about changes in heat, cold and rainfall patterns that had occurred over the last five to ten years. Local perceptions of climate change include overall warmer winter and increased heat in summer with changing patterns of precipitation. The effect of climate change was mostly related to decrease in ground water level and its effect



on livelihoods, livestock and health. Most local perceptions are consistent with the evidence regarding the vulnerability of rural areas to Climate change. Rural Rajasthan has dual burden of Climate change because of absence of awareness and second lack of resources for treatment and adaptation. The systemic collection of these information will enable policy makers, researchers and scientists to design and implement different action plans and strategies for climate change in rural areas which are more vulnerable.

## Criteria for Heat Wave

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World Meteorological Organization (WMO) defines heat wave as five or more consecutive day during which the daily maximum temperature exceeds the average max temperature by 5°C.

Extreme heat events in India pose a serious danger to the people. The spells of hot weather are often seen to move from one region to another. This phenomenon is termed as 'Heat wave'? **(As defined by Indian Meteorological Department)**

Heat wave need not be considered till maximum temperature of a station reaches at least 40°C for Plains and at least 30°C for Hilly regions.

### **When normal maximum temperature of a station is less than or equal to 40°C**

- ▶ Heat Wave Departure from normal is 5°C to 6°C
- ▶ Severe Heat Wave Departure from normal is 7° C or more When normal maximum temperature of a station is more than 40°C
- ▶ Heat Wave Departure from normal is 4°C to 5°C
- ▶ Severe Heat Wave Departure from normal is 6°C or more

When actual maximum temperature remains 45°C or more irrespective of normal maximum temperature, heat wave should be declared.

## Rationale of Heat wave action Plan

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May is typically the hottest month in India with temperatures reaching up to 45°C in certain areas before the cooling southwest monsoon rains arrive in July. In this season, it is an utmost priority to prevent heat related illnesses in the vulnerable population especially, children, elderly as well as the slum population who. The need of the moment is to have a plan to help them for adaptation to the temperature changes. As climate change as well as Global warming, are the broad issues needed the coordinated action. Human induced climate change increases the probability of occurring the heat events as well as susceptibility to such heat events. On 19 May 2016, Phalodi in Jodhpur district of Rajasthan recorded the day time temperature indicating 51°C. It ranked as third highest temperature globally. Most of the places in Rajasthan recorded day temperature more than 46°C on that day and top seven highest day time temperatures in India were found from Rajasthan state. From the fact that, 16 heat related deaths and increased admissions in hospitals are reported in Rajasthan on the day of highest temperature. Hence, the necessity of having a proper action plan on priority basis is ratified during the dialogues.

Clarity and sound understanding is needed about roles and responsibilities of various department involved in action, sharing of data, triggers of activation, mapping of vulnerable populations and analysis of extreme

heat wave impact etc. As heat wave is not a notified disaster at national level in India, accurate information and data related to heat wave deaths and illnesses are not available.

However, there are few districts which are identified as hotspots for Extreme Heat :

*Jodhpur, Pali, Jalore, Churu, Bikaner, Hanumangarh, Sri Ganganagar, Bundu, Nagaur, Tonk, Ajmer, Barmer and Sikar.*

In order to take appropriate action, the mortality data as well as weather data need to be gathered. Development of heat action plan is the step ahead to guide and help the officials to get clarity on their role for developing sound coordination. The HAP will help reduce impacts of heat wave on health.

## Heat Adaptation Plan

Rajasthan 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.

### Awareness Generation

#### 1. Information, Education Communication (IEC) Activities

##### i. Target population

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

##### ii. Annual IEC dissemination plan on Heat and Health under NPCCHH, Rajasthan

IEC type	Material	Timeline	Mechanism
<b>Advisory</b>	NPCCHH advisory	March	By email to DNO for further dissemination to health facilities
<b>Early warning</b>	Daily heat bulleting from IMD with health impact information	March-July	<ul style="list-style-type: none"> <li>• Digital display of temperatures on public places and health facilities</li> <li>• Newspaper</li> <li>• Health department/other government website/application</li> </ul>
<b>Posters</b>	<ul style="list-style-type: none"> <li>• 6 posters on heat and health impacts (Hindi)</li> <li>• Posters on heat and health impacts (Hindi)</li> </ul>	February-March	<ul style="list-style-type: none"> <li>• Printing for state-level dissemination at health facilities, public places/buildings</li> <li>• Electronically to DNO for printing at district level and dissemination to health facilities, schools and other public/ government buildings</li> </ul>
<b>Wall painting</b>	<ul style="list-style-type: none"> <li>• In AMC, VMC, SMC with collaborative effort with ART school and Colleges city</li> </ul>	Painted in February-March	<ul style="list-style-type: none"> <li>• In schools and selected colleges</li> <li>• In health facilities</li> </ul>
<b>Hoardings</b>	<ul style="list-style-type: none"> <li>• Posters in Hindi (above)</li> </ul>	March	<ul style="list-style-type: none"> <li>• To be planned with Ahmedabad, Vadodara and Surat Municipalities</li> </ul>

IEC type	Material	Timeline	Mechanism
<b>Audio-Visual</b>	<ul style="list-style-type: none"> <li>3 Audio Jingles NPCCHHIEC</li> <li>Audio Jingle (Hindi)</li> </ul>	March	<ul style="list-style-type: none"> <li>Played 3 times a day during between March-July</li> </ul>
	<ul style="list-style-type: none"> <li>2 Video messages (Hindi) NPCCHHIEC</li> <li>Video message (Hindi)</li> </ul>	March	<ul style="list-style-type: none"> <li>Played 3 times a day during between March- July</li> </ul>
<b>Bus painting</b>	<ul style="list-style-type: none"> <li>Using available material</li> </ul>	March-April	With GSRTC and Corporation city Bus service
<b>Digital display</b>	<ul style="list-style-type: none"> <li>Available GIF</li> <li>Above mentioned video messages</li> </ul>	March-July	Display in health facilities Public digital display boards in major cities
<b>Social medial</b>	All above material + Relevant activity updates	February-July	<ul style="list-style-type: none"> <li>Facebook and Twitter handle of state NPCCHH, NHM</li> <li>WhatsApp groups (State DNO, Health facility group)</li> </ul>

## 2. Observance of important environment-health days

Although there is no specific day on heat-health, observance of following days may be recommended for awareness on health impact of extreme heat (outdoor-indoor).

Day	Activities on Heat-Health
<ul style="list-style-type: none"> <li>World forest Day (March 21)</li> <li>World Water Day (March 22)</li> <li>World Health Day (April 7)</li> <li>Earth Day (April 22)</li> <li>World Environment Day (June 5)</li> <li>World Day to Combat Desertification and Drought (June 17)</li> </ul>	<p><b>IEC Campaigns</b></p> <ul style="list-style-type: none"> <li>Audio-video spots broadcasting</li> <li>Targeted awareness sessions: traffic police, schools, women, children</li> <li>Street plays and local cultural activities, Rallies</li> <li>Sports events</li> <li>Competition: poster, poem/essay, quiz</li> </ul> <p><b>Community level heat mitigation measures</b></p> <ul style="list-style-type: none"> <li>Plantation drive</li> <li>Cool-roofing drive</li> <li>Energy conservation</li> </ul> <p><b>Health facility level activities</b></p> <ul style="list-style-type: none"> <li>Health facility-based patient awareness sessions</li> <li>Energy audit and conservation measures</li> <li>Review of preparedness for heat-related illness</li> </ul>

## Capacity Building Activities

### i. Training material

#### Guidelines

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

**Training modules:** (available [bit.ly/NPCCHHguidelines](https://bit.ly/NPCCHHguidelines) shortly)

- ▶ 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:** NPCCHHchannel <https://bit.ly/NPCCHHyt>

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

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

- ▶ State Institute of Health & Family Welfare: Contact person designation: Dr. O.P. Thakan, Director (SIHFW), Contact detail - 8769575056

*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, Rajasthan

Training Programme for	Trainer	Topics	Timeline
<b>District level</b> (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	<ul style="list-style-type: none"> <li>• Heat-health impact, prevention measures</li> <li>• Surveillance reporting and analysis with weather parameters</li> <li>• Health facility preparedness</li> </ul>	February
<b>Health facility level</b> (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	<ul style="list-style-type: none"> <li>• Heat-health impact, prevention measures</li> <li>• Surveillance case identification and reporting</li> <li>• Health facility preparedness</li> <li>• Clinical management of HRI</li> </ul>	February
<b>Community Health care workers</b> (MPH, ASHA, ANMetc)	District Level Trainers, MO	<ul style="list-style-type: none"> <li>• Heat-health impact prevention</li> <li>• Indoor and outdoor mitigation measures</li> </ul>	February-March
<b>Panchayati Raj Institutions</b>	District level trainers, MO, Health care workers	<ul style="list-style-type: none"> <li>• Heat-health impact prevention</li> <li>• Indoor and outdoor mitigation measures</li> </ul>	February-April

## 3. Strengthening Health Sector Preparedness

### National Heat-Related Illness Surveillance (NHRIS), NPCCHH

#### i. Surveillance guidelines and reporting formats:

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.

## iii. Surveillance training: included under capacity building section

## iv. Surveillance activity monitoring:

- ▶ Review of surveillance activity with DNO: every month (March-July)

## v. Health Sector Preparedness

- ▶ **Guidelines** National Action Plan on Heat Related Illnesses (<https://bit.ly/NAPHRI>)

**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 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 Plan12)
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

## Roles and Responsibilities

	Responsibilities
<b>SNO</b>	<ul style="list-style-type: none"> <li>Disseminate early warnings to district level</li> <li>Finalization of IEC material and dissemination Plan</li> <li>Liaison with IMD for weather alerts and its dissemination</li> <li>Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action</li> <li>Organize IEC campaigns at state level on observance of important environment- health days</li> <li>Organize training sessions for district level and surveillance nodal officer</li> <li>Facilitate training of medical officers in clinical aspects of heat-health impact</li> <li>Ensure daily surveillance reporting from district level</li> <li>Ensure submission and analysis of heat related death at state and district level</li> <li>Monitor daily health data with temperature and humidity levels to monitor trends and hotspots in the state</li> <li>Review health facility preparedness and ambulance services to manage HRI</li> <li>Identify health facilities at different levels that can have heat illness wards with necessary treatment/cooling facilities</li> <li>Keep existing Rapid Response Teams under IDSP prepared to manage HRI if needed for emergency response to extreme heat</li> <li>Review implementation of IEC and surveillance activities at all levels</li> <li>Evaluate and update relevant section of SAPCCHH with support from State Task Force</li> <li>Create organization support and strengthen Environmental Health cell to implement NPCCHH vision, Goal and Objectives</li> <li>Organize sensitization workshops for other stakeholders and line departments</li> <li>Organize seminars and conference to share knowledge and action under NPCCHH.</li> <li>Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, training of health care professionals, vulnerability assessment and applied research</li> <li>Submit report of activities on heat-health under NPCCHH</li> <li>Advocate for reduction in source of greenhouse gas emissions</li> </ul>
<b>DNO</b>	<ul style="list-style-type: none"> <li>Disseminate early warning to block and health facility level</li> <li>Ensure IEC dissemination to community level and facilitate community level IEC activities</li> <li>Liaison with IMD to get daily observed temperature and relative humidity information</li> <li>Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action</li> <li>Conduct training for block health officers, medical officers, with relevant training manuals</li> <li>Conduct sensitization of vulnerable groups: police officers, outdoor works, women, children etc</li> <li>Organize IEC campaigns at district level on observance of important environment-health days</li> <li>Ensure daily reporting from health facilities and compile the data</li> <li>Analyze daily health data with temperature and humidity levels to monitor trends and hotspots in district</li> <li>Support timely suspected heatstroke death analysis and its reporting</li> <li>Submit analyzed weekly report to SNO, NPCCHH, Hq and other departments for necessary action</li> <li>Coordinate with other agencies for response</li> <li>Update DAPCCHH with support from District Task Force</li> <li>Submit report of activities on heat-health under NPCCHH</li> <li>Advocate for reduction in source of greenhouse gas emissions</li> </ul>

	Responsibilities
<b>Block health officer</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> <li>• Ensure training of medical officers</li> <li>• Organize PRI sensitization workshop and training for vulnerable groups</li> <li>• Implement heat mitigation efforts</li> </ul>
<b>City health department</b>	<ul style="list-style-type: none"> <li>• Support in development and implementation of city-specific heat-health action plan</li> </ul>
<b>Medical officer</b>	<ul style="list-style-type: none"> <li>• Conduct health facility-based IEC activities</li> <li>• Support community level IEC activities</li> <li>• Be aware of AQI levels and health impact of air pollution</li> <li>• Ensure necessary health facility preparedness in early diagnosis and management of cases</li> </ul>
<b>Panchayati Raj Institutions</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> </ul>

## CHAPTER 8

# Health Action Plan on Extreme Weather Event-Related Health Issues



Floods, droughts, cyclones, earthquakes, and landslides have been a recurrent phenomenon in the history of the Indian sub-continent. About 60% of the landmass is prone to earthquakes of various intensities, over 40 million hectares is prone to floods, about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. Hotspot and Vulnerability to Extreme Weather Events(EWE).

Rajasthan state is vulnerable to extreme weather events like Water Scarcity. Extreme Heat, Wild Fire, Earthquake, flood, cyclone. Following hotspot districts are identified each event:

Sl. No.	Climate Stressors	Risk Levels by Districts												
		Jodhpur	Pali	Jalore	Churu	Bikaner	Hanuman garh	Sri Ganga Nagar	Bundu	NFue	Tonk	Ajmer	Barmer	Sikar
1	Water Scarcity	H	H	H	H	H	H	H	H	H	H	H	H	H
2	Extreme Heat	H	H	H	H	H	H	H	H	H	H	H	H	H
3	Wild Fire	H	H	H	H	H	H	H	H	H	H	H	H	H
4	Earthquake	M	M	M	M	M	M	M	M	M	M	M	M	M
5	River Flood	L	L	M	M	L	H	H	L	L	L	L	L	VL
6	Urban Flood	L	L	VL	L	L	H	M	L	VL	L	L	L	VL
7	Coastal Flood	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL	VL
8	Cyclone	VL	VL	L	L	L	L	L	L	L	L	L	L	L

Climate induced hazard profiles for tranche-II project road districts of Rajasthan (by ThinkHazard web-based tool)

## Adaptation Plan

### Awareness generation and sensitization programmes

To increase the general awareness amongst all the relevant stakeholders including vulnerable communities, healthcare providers, and policy makers regarding the impacts of extreme weather events and disasters and ways to address them. The districts are directed 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. Some of the pathways identified in this regard include:

- ▶ Mass meetings to be organized for schools and college students
- ▶ Advertisement and promotion through IEC
- ▶ Posters, pamphlets, billboards and other advertisement modes like social media
- ▶ Rallies
- ▶ Wall paintings on earthquake resistant buildings in important places to educate people and give information on earthquake resistant technology
- ▶ Public awareness programmes on safe construction practices

## Information, Education Communication (IEC) Activities

### i. Target population

- ▶ **Vulnerable districts/hotspots:** listed above
- ▶ **Vulnerable groups** (Primarily Children, women, older adults, traffic police, outdoor workers/vendors)

### ii. Annual IEC dissemination plan for extreme weather events and their health impact under NPCCHH in Rajasthan

IEC type	Material	Timeline	Mechanism
<b>Advisory</b>	NPCCHHPrg	Seasonal	By email to DNO for further dissemination to health facilities
<b>Early warning</b>	Bulletins/advisory by IMD (storm, cyclone), CWC (flood) sent by NPCCHH	Seasonal	<ul style="list-style-type: none"> <li>• Health department/other government website/application</li> <li>• Digital display of temperatures on public places and health facilities</li> </ul>
<b>Posters</b>	<ul style="list-style-type: none"> <li>• 6 posters on various EWE and health impacts (Hindi) NPCCHHIEC</li> <li>• Posters on heat and health impacts (Hindi)</li> </ul>	Seasonal, as needed	<ul style="list-style-type: none"> <li>• State-level dissemination at health facilities, public places/buildings</li> <li>• By email to DNO for printing at district level and dissemination to health facilities, schools and other public/government buildings</li> </ul>
<b>Wall painting</b>	Using available material	Painted in July-September	<ul style="list-style-type: none"> <li>• In schools and selected colleges</li> <li>• In health facilities</li> </ul>
<b>Hoardings</b>	<ul style="list-style-type: none"> <li>• Posters in Hindi (above)</li> </ul>	Seasonal, as needed	<ul style="list-style-type: none"> <li>• To be planned with Ahmedabad, Vadodara and Surat Municipalities</li> </ul>
<b>Audio-Visual</b>	<ul style="list-style-type: none"> <li>• Audio Jingle (Hindi)</li> <li>• 5 Video messages (Hindi) NPCCHHIEC</li> <li>• Video message (Hindi)</li> </ul>	Seasonal, as needed	<ul style="list-style-type: none"> <li>• Played seasonally and around relevant extreme weather events</li> </ul>
<b>Bus painting</b>	Using available material	Painted in June-July, Seasonally as needed	With State Transport department and Corporation city Bus service

IEC type	Material	Timeline	Mechanism
<b>Digital display</b>	<ul style="list-style-type: none"> <li>• 5 GIF</li> <li>• Above mentioned video messages</li> </ul>	Seasonal, as needed	Display in health facilities Public digital display boards in major cities
<b>Social medial</b>	All above material + Relevant activity updates	Seasonal, as needed	<ul style="list-style-type: none"> <li>• Facebook and Twitter handle of state NPCCHH, NHM</li> <li>• WhatsApp groups (State DNO, Health facility group)</li> </ul>

### iii. Observance of important environment-health days

Day	Activities on Heat-Health
<ul style="list-style-type: none"> <li>• International Day for Disaster Risk Reduction</li> </ul>	<p><b>IEC Campaigns</b></p> <ul style="list-style-type: none"> <li>• Audio-video spots broadcasting</li> <li>• Targeted awareness sessions:women, children, occupational groups</li> <li>• Mock drill, disaster response exercise</li> <li>• Sports events</li> <li>• Competition: poster, poem/essay, quiz</li> </ul> <p><b>Health facility level activities</b></p> <ul style="list-style-type: none"> <li>• Health facility-based patient awareness sessions</li> <li>• Conduct assessment of disaster vulnerability/energy/water conservation measures</li> <li>• Review of implementation of climate-resilient measures</li> </ul>

## Capacity Building Activities

### i. Training material

#### Guidelines:

- ▶ National Action Plan on Disaster related Health Issues

#### Training modules:

- ▶ 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:** NPCCHHchannel<https://bit.ly/NPCCHHyt>

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

#### GIDM

#### 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 Extreme Weather Events and Health under NPCCHH, Rajasthan

Training Programme for	Trainer	Topics	Timeline
<b>District level</b> (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	<ul style="list-style-type: none"> <li>Climate change and impact of extreme weather events in India</li> <li>Formation of disaster management committees and plans</li> <li>Health facility vulnerability, resilient measures and disaster preparedness</li> <li>Disaster response in coordination with state/district disaster management authority</li> <li>Post-disaster health impact assessment and response</li> </ul>	February
<b>Health facility level</b> (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	<ul style="list-style-type: none"> <li>Health facility disaster vulnerability assessment</li> <li>Disaster management committee and plan</li> <li>Climate resiliency measures (structural/functional)</li> <li>Health facility preparedness for EWE/disaster response</li> <li>Post-disaster surveillance and damage assessment</li> </ul>	February
<b>Community Health care workers</b> (MPH, ASHA, ANM etc)	District Level Trainers, MO	<ul style="list-style-type: none"> <li>Climate change and health impact of extreme weather events</li> <li>Disaster planning and response</li> </ul>	February-March
<b>Panchayati Raj Institutions</b>	District level trainers, MO, Health care workers	<ul style="list-style-type: none"> <li>Climate change and health impact of extreme weather events</li> <li>Disaster planning and response with community participation</li> </ul>	February-April

## Strengthening Health Sector Preparedness

### i. Early warning

Dissemination of early warnings for Heat wave, Coldwave, Flood, Cyclone etc to health facility **level** and community level

### ii. Surveillance

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

### iii. Health Facility Preparedness

- ▶ Vulnerability assessment of health facility in context of climate change-extreme weather events
- ▶ Identify structural changes/retrofitting measures at the facility level to equip the healthcare facility
- ▶ Formalize 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)
- Establish Sustainable procurement committee

**Revision of Health Action Plan on Disaster-Related Health Issues** in State Action Plan on Climate Change and Human Health (SAPCCHH):

The section should be revised every year after December with support from coordinating agencies based on updated surveillance data, its analysis with weather parameters, targets achieved, and predicted climate variability with support from multi-sectoral task force.

## Roles and Responsibilities

	Responsibilities
<b>SNO</b>	<ul style="list-style-type: none"> <li>• Disseminate early warnings to district level</li> <li>• Finalization of IEC material and dissemination Plan</li> <li>• Formalize intersectoral coordination for disaster planning, management and response with SDMA/IMD and other response departments</li> <li>• Organize training of district level officers</li> <li>• Facilitate assessment and implement of climate resilient measures in health facilities</li> <li>• Review implementation of IEC, training and surveillance activities at all levels</li> <li>• Evaluate and update relevant section of SAPCCHH with support from State Task Force</li> <li>• Create organizational support and strengthen Environmental Health cell to implement NPCCHH vision, Goal and Objectives</li> <li>• Organize sensitization workshops for other stakeholders and line departments</li> <li>• Collaborate with academic institutes for support in updating SAPCCHH, Surveillance activity monitoring, training of health care professionals, vulnerability assessment and applied research</li> <li>• Submit reports of activities on EWE and health under NPCCHH</li> </ul>
<b>DNO</b>	<ul style="list-style-type: none"> <li>• Disseminate early warning to block and health facility level</li> <li>• Ensure IEC dissemination to community level and facilitate community level IEC activities</li> <li>• Organize training for block health officers and MO</li> <li>• Formalize intersectoral coordination for disaster planning, management and response with SDMA/IMD and other response departments</li> <li>• Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action</li> <li>• Identification and communication of Evacuation routes &amp; relief camps</li> <li>• Support planning and management of health care services in relief camps</li> <li>• Provide necessary IEC on health and sanitation in relief camps training for block health officers, medical officers, with relevant training manuals</li> <li>• Conduct sensitization of vulnerable groups: police officers, outdoor works, women, children etc.</li> <li>• Organize IEC campaigns at district level on observance of important environment- health days</li> <li>• Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessment and health facility damage due to EWE</li> <li>• Update DAPCCHH with support from District Task Force</li> <li>• Submit reports of activities on EWE and health under NPCCHH</li> </ul>

	Responsibilities
<b>Block health officer</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> <li>• Ensure training of medical officers</li> <li>• Organize PRI sensitization workshop and training for vulnerable groups</li> <li>• Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessment and health facility damage due to EWE</li> </ul>
<b>Medical officer</b>	<ul style="list-style-type: none"> <li>• Conduct health facility-based IEC activities</li> <li>• Support community level IEC activities</li> <li>• Preparation of Disaster Management Plans and hospital safety plan</li> <li>• Assessment of health facility in context of climate change-extreme weather events</li> <li>• Identifying structural changes/retrofitting measures at the facility level to equip the healthcare facility</li> <li>• Ensuring routine monitoring and maintenance of support functions (Water quality, waste management)</li> <li>• Health facility preparedness for seasonal events</li> </ul>
<b>Panchayati Raj Institutions</b>	<ul style="list-style-type: none"> <li>• Conduct community level IEC activities</li> <li>• Community involvement in planning and demonstration of measure taken before-during-after an EWE</li> </ul>

# Health Action Plan on Vector-borne Illnesses in Context of Climate Change



## Situational analysis of VBD in Rajasthan

### i. District and City with high Malaria prevalence, Rajasthan, 2021-22

Sl. No.	District/city	Malaria cases	
		2021	2022
1	Udaipur	275	212
2	Barmer	34	530
3	Jaisalmer	198	332
4	Pali	50	63
5	Rajsamand	69	45

### ii. District and City with high Dengue prevalence, Rajasthan, 2021-22

Sl. No.	District/city	Dengue cases	
		2021	2022
1	Jaipur	3533	4198
2	Jodhpur	1459	166
3	Kota	1673	258
4	Dholpur	818	516
5	Dausa	501	669
6	Bikaner	4073	783
7	Bharatpur	1017	474
8	Alwar	920	467
9	Barmer	823	1201
10	Jhalawar	923	17
11	Jhunjhunu	875	483
12	Udaipur	606	567
13	Ajmer	484	201
14	Karoli	776	388

### iii. District and City with high Chikungunya prevalence, Rajasthan, 2021-22

Sl. No.	District/city	Chikungunya Cases	
		2021	2022
1	Jaipur	457	84
2	Alwar	77	14
3	Bharatpur	70	15
4	Karoli	64	3

## Awareness Generation and IEC Activities

The IEC activities for vector borne disease are jointly done by NVBDCP division and EHC:

### A. Information, Education Communication (IEC) Activities

#### i. Target population

- **Areas identified** in under section a (above)
- **Vulnerable groups** (Primarily children, pregnant women, older adults, immune-compromised, outdoor workers/vendors)

#### ii. Annual IEC dissemination plan for Vector-borne diseases in context of climate change under NPCCHH, Rajasthan

IEC type	Material	Timeline	Mechanism
<b>Posters</b>	<ul style="list-style-type: none"> <li>• Posters on VBD and climate change (Hindi)</li> <li>• May update posters made by state NVBDC</li> <li>• Posters on VBD and climate change (Hindi)</li> </ul>	<ul style="list-style-type: none"> <li>• After extreme weather events i.e. floods, cyclone, and other natural disaster i.e. earthquake/tsunami</li> <li>• Collaborate with NVBDCP</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborate with NVBDCP</li> </ul>
<b>Wall painting</b>	Using available material	Painted in June-July, Seasonally as needed	<ul style="list-style-type: none"> <li>• In schools and selected colleges</li> <li>• In health facilities</li> </ul>
<b>Hoardings</b>	<ul style="list-style-type: none"> <li>• Posters in Hindi (above)</li> </ul>	June-July, Seasonally as needed	<ul style="list-style-type: none"> <li>• To be planned with hotspot Municipalities and District</li> </ul>
<b>Audio-Visual</b>	<ul style="list-style-type: none"> <li>• 3 Audio Jingles</li> <li>• Audio Jingle (Hindi)</li> <li>• 2 Video messages (Hindi)</li> <li>• Video message (Hindi)</li> </ul>	June-July, Seasonally, as needed in case of extreme weather events	<ul style="list-style-type: none"> <li>• Plan according to PIP guidelines and in coordination with NVBDCP</li> </ul>
<b>Bus painting</b>	Using available material	Painted in June-July, Seasonally as needed	<ul style="list-style-type: none"> <li>• With GSRTC and Corporation city Bus service</li> </ul>
<b>Digital display</b>	<ul style="list-style-type: none"> <li>• Available GIF</li> <li>• Above mentioned video messages</li> </ul>	June-July, Seasonally as needed	<ul style="list-style-type: none"> <li>• Display in health facilities</li> <li>• Public digital display boards in major cities</li> </ul>
<b>Social medial</b>	All above material + Relevant activity updates	June-July, Seasonally, as needed in case of extreme weather events	<ul style="list-style-type: none"> <li>• Facebook and Twitter handle of state NPCCHH, NHM</li> <li>• WhatsApp groups (State DNO, Health facility group)</li> </ul>

## B. 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
<ul style="list-style-type: none"> <li>World malaria day (April 25)</li> <li>World mosquito day (August 20)</li> <li>World Environmental Health Day (September 26)</li> </ul>	<p><b>IEC Campaigns</b></p> <ul style="list-style-type: none"> <li>Audio-video spots broadcasting</li> <li>Targeted awareness sessions: urban slums, schools, women, children</li> <li>Street plays and local cultural activities, Rallies</li> <li>Sports events</li> <li>Competition: poster, poem/essay, quiz</li> </ul> <p><b>Collaborate with NVBDCP</b></p>

### Capacity Building Activities

#### i. Training material

**Training modules:** (available [bit.ly/NPCCHHguidelines](https://bit.ly/NPCCHHguidelines) shortly)

- ▶ 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:** NPCCHHchannel <https://bit.ly/NPCCHHyt>

- ▶ Training on climate change and its impact on VBD burden

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

State Institute of Health & Family Welfare: Contact person designation: Dr. O.P. Thakan, Director (SIHFW), Jaipur Contact detail - 8769575056

*Training on Vector-borne diseases may be expanded to include other climate sensitive health issues specifically extreme weather events.*

#### iii. Annual training plan for vector-borne diseases in context of climate change under NPCCHH, Rajasthan

Training Programme for	Trainer	Topics	Timeline
<b>District level</b> (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	<ul style="list-style-type: none"> <li>Role of climate change impact in VBD burden, prevention measures</li> <li>Tracking of VBD and Integrating rainfall, humidity and temperature parameters with VBD surveillance</li> <li>Post-disaster VBD surveillance, prevention, management</li> </ul>	July or after extreme weather events/natural disasters



Training Programme for	Trainer	Topics	Timeline
<b>Health facility level</b> (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	<ul style="list-style-type: none"> <li>Role of climate change impact in VBD burden, prevention measures</li> <li>Strengthen surveillance reporting</li> <li>Post-disaster VBD surveillance, prevention, management in community and at relief camps</li> </ul>	July-August or after extreme weather events/natural disasters
<b>Community Health care workers</b> (MPH, ASHA, ANM etc)	District Level Trainers, MO	<ul style="list-style-type: none"> <li>Role of climate change impact in VBD burden, prevention measures</li> <li>Post-disaster VBD surveillance, prevention, management in community and at relief camps</li> </ul>	
<b>Panchayati Raj Institutions</b>	District level trainers, MO, Health care workers	<ul style="list-style-type: none"> <li>Role of climate change impact in VBD burden, prevention measures</li> </ul>	

## Strengthening Health Sector Preparedness

### Integrate weather parameters with VBD surveillance under NVBDC at District level

- ▶ Monitor VBD with weather parameters
- ▶ Initiate surveillance based on predicted expansion of vectors to pick up emerging foci with support from State Programme Officers (SPO) and District malaria Officers (DMO) should

i. **Surveillance training:** included under capacity building section

ii. **VBD prevention and control measures**

- ▶ **Planning** of indoor residual spray a month before peak of malaria cases based on historical data
- ▶ Management of new foci of transmission in the same way as other endemic areas.
- ▶ **Epidemic preparedness** especially after extreme weather events or natural disasters

### Roles and responsibilities (Govt & non-Govt) in implementation of VBD activities in context of climate change under NPCCNN, Rajasthan

Sl. No.	Department/Agency	Area of Collaboration	Specifics
1	<b>NVBDCP, Rajasthan</b>	Overall guidance and policy formulation	Guide and the state governments in resurgence and containment of any VBD
2	<b>State Nodal Officer, Climate Change</b>	To support the state govt. in control of VBDs particularly in climate sensitive states	<ul style="list-style-type: none"> <li>Oversee vector control measures</li> <li>Oversee health sector preparedness</li> <li>Oversee VBD surveillance, control in post-disaster situations in community and relief camps</li> <li>Train DNO, DMO</li> <li>Sensitization workshops to increase awareness on climate change and its impact on VBD</li> </ul>
3	<b>India Meteorological Department</b>	To provide meteorological data as and when required	<ul style="list-style-type: none"> <li>To help the state govt. in collaboration with any research institute, in analysis of relationship between climatic factors and a particular VBD so as to forewarn the impending outbreaks</li> </ul>

Sl. No.	Department/Agency	Area of Collaboration	Specifics
4	<b>NGO at state and district level for reach to community</b>	Health education at community level	<ul style="list-style-type: none"> <li>Conduct workshops for IEC activities for different level of staff in the identified areas in consultation with the state govts</li> </ul>
5	<b>State Programme Officer</b>	Overall planning and execution of surveillance and intervention measures to control VBDs	<ul style="list-style-type: none"> <li>Supervise and guide the DMOs in control of VBDs</li> </ul>
6	<b>State Entomologist</b>	To provide guidance in vector control.	<ul style="list-style-type: none"> <li>Generate data on fortnightly fluctuations in density of vector species so as to guide the state government in choosing appropriate time of IRS activities. To generate data on susceptibility status of disease vectors for using appropriate insecticide for IRS/larvicide for vector control</li> </ul>
7	<b>Chief Medical Officer/District Malaria Officer/ Disease Surveillance officer</b>	Execution of task assigned by the SPO	<ul style="list-style-type: none"> <li>Supervise and guide surveillance and intervention measures for control of VBDs in the district</li> </ul>
8	<b>Media</b>	To be vigilant for report of any upsurge/outbreak of any VBD	<ul style="list-style-type: none"> <li>Impart health education to masses through print and audiovisuals means</li> </ul>

### Revision of Health Action Plan on VBD in State Action Plan on Climate Change and Human Health (SAPCCHH)

The section should be revised every year after December in collaboration with NVBDCP based on updated surveillance data, its analysis with weather parameter, prevention and control activities, targets achieved, and predicted climate variability with support from multi-sectoral task force.

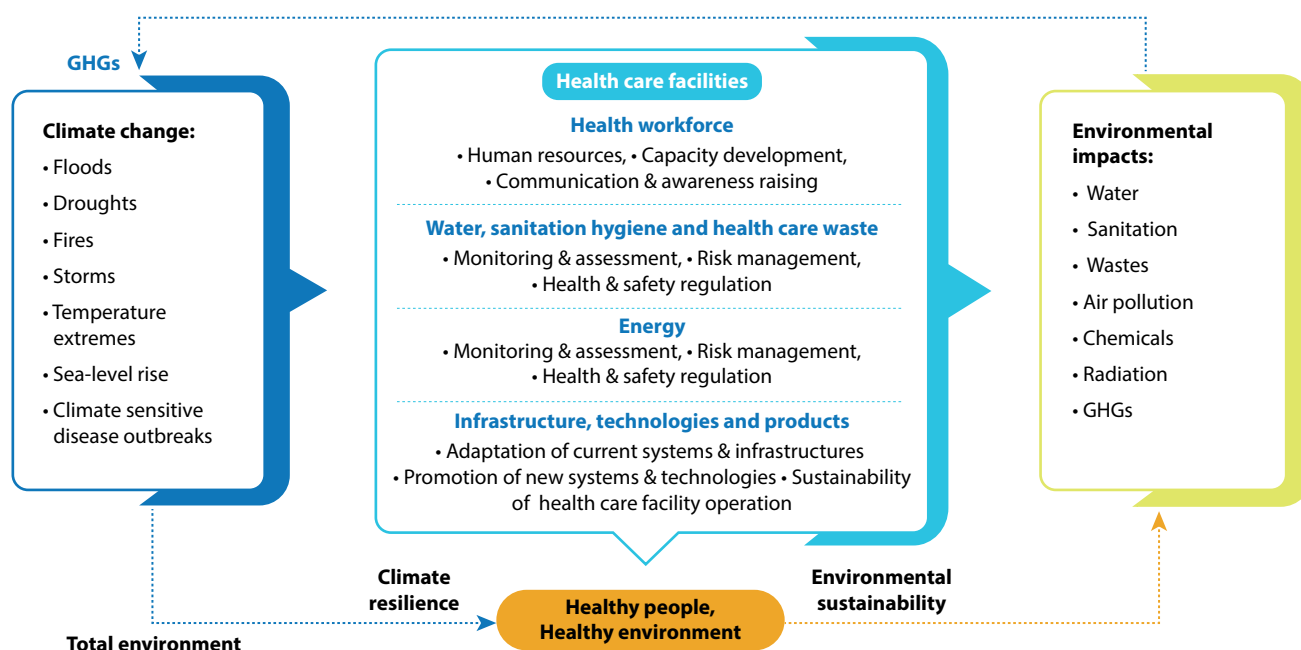
# Action Plan for Green and Climate Resilient Health Care Facilities



“Climate-resilient and environmentally sustainable health care facilities anticipate, respond to, cope with, 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 centres – 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 defense to 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.

## 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

- ▶ Energy Auditing
- ▶ Installation of LED lighting at Health Care Facilities
- ▶ Installation of Solar panels
- ▶ Water Conservation Measures – Rain water Harvesting

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

### Environmentally Sustainable (Green) Measures at Health Care Facilities

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#### a. Energy Auditing

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

The guiding principles in this respect include:

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

#### b. Replacing the existing non-LED lights with LEDs

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

The guiding principle in this respect would be: Healthcare facilities would have a policy on purchasing and using energy- efficient equipment and devices. The facilities would gradually phase out the incandescent bulbs with LEDs.

#### c. Installation of Solar panels

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

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

## d. Water conservation

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

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

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

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

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

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

### New Buildings

- ▶ Climate risk assessment at the time of planning and designing the building.
- ▶ Use of high-performance glass on windows, doors, and roofs to prevent the heat inside and allows sunlight and fresh air to enter the room.
- ▶ Use double glazing glass on windows; it provides thermal and optical properties to the building and reduce the noise level.
- ▶ Insulation of building from inside and outside in colder regions of the country.

- ▶ Ensure the plinth level is above the high flood level as known locally or storm surge level ( in costal districts) and make the building accessible with ramps and railing to create a barrier free environment.
- ▶ Installation of Rainwater Harvesting System
- ▶ Installation of alternative energy systems
- ▶ Installation of STP & ETP

## Existing Infrastructure

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

## Implementation Plan

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### Awareness Generation

- ▶ Awareness and sensitization on climate change events such as heat waves, flooding, air pollution events, and waste management
- ▶ Sensitization workshops on Sustainable Procurement
- ▶ Awareness on energy efficient measures and water conservation measures

### Capacity building

#### i. Training material

Para medical officers & Health care **Guidelines:**

- ▶ National Action Plan on Green and Climate-Resilient Health Care Facilities

**Training modules:** (available [bit.ly/NPCCHHguidelines](https://bit.ly/NPCCHHguidelines) shortly)

- ▶ State-District level training modules
- ▶ Medical officer training
- ▶ Workers
- ▶ Community level training: vulnerable population group

**Other training resources:** NPCCHHchannel<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

For State Institute of Health & Family Welfare

Contact person designation: Dr O.P.Thakan, Director (SIHFW) Jaipur Contact detail -8769575056

*Training on green and climate-resilient health care facilities (GCRHCF) may be expanded to include other climate sensitive health issues specifically extreme weather events.*

## iii. Annual training plan for Extreme Weather Events and Health under NPCCHH, Rajasthan

Training Programme for	Trainer	Topics	Timeline
<b>District level</b> (DNO- CC, trainers)	State Level Trainers SNO-CC, Consultant	<ul style="list-style-type: none"> <li>• Role GCRHCF in terms of climate impact</li> <li>• Assessments required for implementation</li> <li>• Coordination with supporting agencies</li> </ul>	August-September
<b>Health facility level</b> (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	<ul style="list-style-type: none"> <li>• Role GCRHCF in terms of climate impact</li> <li>• Assessments required for implementation</li> <li>• Coordination with supporting agencies</li> </ul>	September
<b>Community Health care workers</b> (MPH, ASHA, ANM etc)	District Level Trainers, MO	<ul style="list-style-type: none"> <li>• Role GCRHCF in terms of climate impact</li> </ul>	September-October
<b>Panchayati Raj Institutions</b>	District level trainers, MO, Health care workers	<ul style="list-style-type: none"> <li>• Role GCRHCF in terms of climate impact</li> <li>• Assembling support for implementation</li> </ul>	Anytime

## Strengthening Health Sector Preparedness

### i. Implementation of Climate Resilient measures at health facilities

- a. New HCF should be built in compliance with Green & Climate Resilient Infrastructural features as of updated IPHS
- b. Existing HCF are recommended to undergo retrofitting to implement structural climate-resilient (i.e.to withstand disasters and provide continuous, quality care to the affected population post-disaster) measures as per IPHS guidelines. Health facilities' vulnerability to prevalent climate change impact should be assessed to determine retrofitting the measures. For the retrofitting locally sourced and sustainable building designs and construction technologies should be considered to reduce energy requirements, carbon footprint, and cost-effectiveness.
- c. Extreme weather event specific measures(Refer: Guidelines on Green (Environmentally Sustainable) and Climate Resilient Health Care Facilities, <https://bit.ly/NPCCHHPIP>)
  - Flood resilient measures
  - Cooling measures

### ii. Implementation of Green (Environmentally-friendly and sustainable) considered in FY 2023-24 are as following

- a. Energy Auditing of the Healthcare Facilities for Energy Efficiency level in the HCFs
- b. Replacement of existing (non-LED) lighting with LED in Healthcare Facilities

- c. Installation of Solar Panels in Healthcare Facilities
- d. Install Rainwater Harvesting System in Healthcare Facilities

### iii. Implementation plan for Green Measures in Healthcare facilities activity plan for 2022-23

Measure	Unit	Justification	Pre-requisite
<b>Replacing Non-LED with LED lighting in</b>			
<b>CHC</b>	68	Selected 2 CHC in 34 Districts	
<b>PHC</b>	68	Selected 2 PHC in 34 Districts	
<b>Installing Solar panels</b>			Following assessments should be done at health facility level with support from DNO, MO and nodal technical agency identified by state. <ul style="list-style-type: none"> <li>• Energy audit</li> <li>• Water audit</li> <li>• Disaster vulnerability</li> </ul>
<b>DH</b>	2	Selected 2 DH in 2 Districts	
<b>SDH</b>	4	Selected 4 SDH in 3 Districts	
<b>CHC</b>	2	Selected 2 CHC in 2 Districts	
<b>TOTAL</b>	<b>8</b>		

### iv. Plan of implementation of green measures in healthcare facilities 2022-2027, NPCCHH, Rajasthan

Green Measures in Healthcare facilities	Units					
	2022-23	2023-24	2024-25	2025-26	2026-27	Total
<b>Replace existing Lighting Non-LED with LED in CHC</b>	0	68	75	100	125	<b>368</b>
<b>Replace existing Lighting Non LED with LED in PHC</b>	68	0	400	400	686	<b>1554</b>
<b>Installing Solar panels at CHC</b>	1	1	50	75	100	<b>227</b>
<b>Installing Solar panels at PHC</b>	0	0	200	300	400	<b>900</b>
<b>Installing Rainwater harvesting System CHC</b>	0	0	50	75	100	<b>225</b>
<b>Installing Rainwater harvesting System PHC</b>	0	0	100	200	400	<b>700</b>

**Monitoring and evaluation of activities** should be done in-line with targets set in PIP. Refer PIP Guidelines: <https://bit.ly/NPCCHHPIP>

## Roles and Responsibilities

Responsibilities	
<b>SNO</b>	<ul style="list-style-type: none"> <li>• Disseminate early warnings to district level</li> <li>• Finalization of IEC material and dissemination Plan</li> <li>• Organize training sessions for district level officers and trainers</li> <li>• Identify health facilities for priority implementation based on disaster and health facility vulnerability</li> <li>• Identify relevant state and district level nodal agencies and collaborate with them for assessment of health facilities for implementation of measures</li> <li>• Facilitate and monitor necessary assessments at health facility level</li> </ul>



Responsibilities	
	<ul style="list-style-type: none"> <li>• Facilitate implementation of structural and functional measures at health facility level</li> <li>• Submit report of activities on heat-health under NPCCHH</li> <li>• Advocate for reduction in source of greenhouse gas emissions</li> </ul>
<b>DNO</b>	<ul style="list-style-type: none"> <li>• Conduct training for block health officers, medical officers, with relevant training manuals</li> <li>• Support conduction for following assessment at health facility level               <ul style="list-style-type: none"> <li>▪ Energy audit</li> <li>▪ Water audit</li> <li>▪ Disaster-vulnerability assessment</li> </ul> </li> <li>• Support following functional measures at health facility level               <ul style="list-style-type: none"> <li>▪ Water committee</li> <li>▪ Sustainable procurement committee</li> <li>▪ Operational measures to make health facility functioning during disasters or power cut</li> </ul> </li> <li>• Coordinate with other agencies for assessment and implementation of identified structural and functional measures</li> <li>• Update DAPCCHH with support from District Task Force</li> <li>• Submit report of activities on heat-health under NPCCHH</li> </ul>
<b>Block health officer</b>	<ul style="list-style-type: none"> <li>• Ensure training of medical officers</li> <li>• Organize PRI sensitization workshop</li> <li>• Coordinate with other agencies for assessment and implementation of identified structural and functional measures</li> </ul>
<b>Medical officer</b>	<ul style="list-style-type: none"> <li>• Conduct health facility assessment               <ul style="list-style-type: none"> <li>▪ Energy audit</li> <li>▪ Water audit</li> <li>▪ Disaster-vulnerability assessment</li> </ul> </li> <li>• Lead following functional measures               <ul style="list-style-type: none"> <li>▪ Water committee</li> <li>▪ Sustainable procurement committee</li> <li>▪ Operational measures to make health facility functioning during disasters or power cut</li> </ul> </li> <li>• Support community level IEC activities</li> <li>• Identify local funding opportunities: e.g. CSR initiative, NGO funding</li> </ul>
<b>Panchayati Raj Institution</b>	<ul style="list-style-type: none"> <li>• Support retrofitting and new health facilities with local funding source and community involvement</li> </ul>



# **PART III**

## **Budget**



# CHAPTER 11

## Budget



### Budget for implementation of NPCCHH activities during 2022-24, Rajasthan

Sl. No.	Activities	Year 1	Year 2
1	Infrastructure - Civil works (I&C)	Old/ongoing work	-
		New Work	10.00
2	Capacity building incl. training	21.11	21.11
3	Others including operating costs (OOC)	276.20	276.20
4	IEC & Printing	49.70	49.70
5	Planning & M&E	6.00	6.00
6	Surveillance, Research, Review, Evaluation (SRRE)	4.00	4.00
	<b>Total</b>	<b>367.01</b>	<b>367.01</b>

Note: Year 1 = FY 2022-23; Year 2 = FY 2023-24.

### Tentative budget for implementation of NPCCHH activities for next 3 years (upto FY 2026-2027), Rajasthan (with a tentative 15% increase in budget)

Sl. No.	Activities	Year 1	Year 2	Year 3
1	Infrastructure-Civil works (I&C)	Old/ongoing work	-	-
		New Work	11.50	13.23
2	Capacity building incl. training	24.28	27.92	32.11
3	Others including operating costs (OOC)	317.63	365.27	420.07
4	IEC & Printing	57.16	65.73	75.59
5	Planning & M&E	6.90	7.94	9.13
6	Surveillance, Research, Review, Evaluation (SRRE)	4.60	5.29	6.08
	<b>Total</b>	<b>422.06</b>	<b>485.37</b>	<b>558.18</b>

Note: Year 1 = FY 2024-25; Year 2 = FY 2025-26; Year 3 = FY 2026-27.





