



Ministry of Health and Family Welfare  
Government of India

# State Action Plan on Climate Change and Human Health

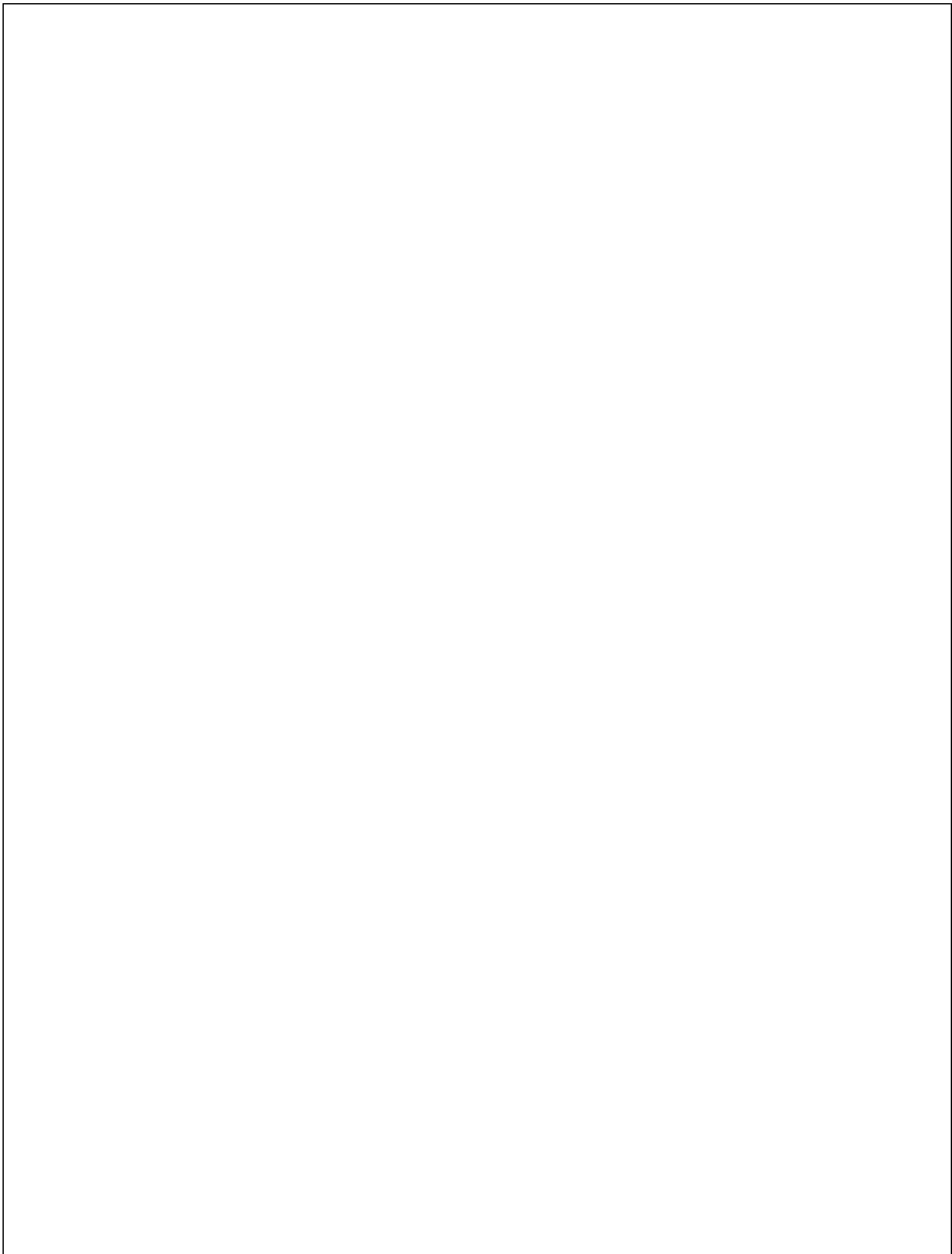
## Punjab



National Centre  
for Disease Control  
Government of India



National Programme  
on Climate Change  
and Human Health



# **Part 1: Climate Change and Its Impact in Punjab**

## **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 social and environmental determinants of health like –clean air, safe drinking water, sufficient food and secure shelter.

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

The *United Nations Framework Convention on Climate Change (UNFCCC)* came into force on 21<sup>st</sup> March 1994. Since then many steps were initiated to reduce the effect of climate change at meetings like “*Rio Convention 1992*”, *Kyoto protocol 1997*”, “*Male’ Declaration 1998*”, “*Convention of Parties*”, “*Cancun Agreement 2010*”, “*Durban Platform 2011*”, “*Nationally Determined Contributions*” (NDCs) at Conference of Parties 21”.

India is signatory to “*Male’ Declaration*” wherein health sector has to be strengthened so as to make it climate resilient. According to Male’ Declaration, it is desired that health-care facilities should be prepared to adapt to the climatic adversaries and be climate-resilient, particularly to encourage that these are able to withstand any climatic event, and that essential services such as water, sanitation, waste management and electricity are functional during such events. Further, for 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.

ions. 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 National Action Plan for Climate Change (NAPCC) as well as through programmes run by various ministries. As a follow-up action, Ministry of Health and Family Welfare (MoHFW) constituted a National Expert Group on Climate Change & Health(NEGCH) to prepare National Action Plan on Climate Change and Human Health (NAPCCHH) and recommend strategies for indicators, mitigation, capacity building etc.

*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), under which the Punjab has prepared its State Action Plan on Climate Change and Human Health (SAPCCCHH). Since the inception of the programme i.e. 2019, the SAPCCCHH is a long-term vision and planning document prepared by the Department of Health & Family Welfare , Punjab, applicable for up till year 2027. Based on this document, district specific action plans will also be prepared. The Punjab SAPCCCHH 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 disease burden and develop a climate responsive and sustainable healthcare ecosystem in the state.

### **State Action Plan on Climate Change**

Punjab was in the front for leading the climate action and launched Punjab State Action Plan on ClimateChange in 2014. Punjab SAPCC 1.0 provided the first state-wide cross-sectoral climate change impact and vulnerability assessment, and verbalized adaptation and mitigation strategies to be carried out by thestate Government Departments. Since the

launch of Punjab SAPCC 1.0, the state has effectively workedtowards addressing vulnerabilities and increasing state resilience towards climate change. SAPCC 2.0 has been formulated to provide an inclusive approach and define the priority actions under each missionhaving strong linkages with INDC goals for post-2020 which can be mainstreamed into existing schemes, policies & programmes.

### **Activities being taken in the Punjab to mitigate and adapt against Climate Change**

#### **Climate Change Knowledge Centre**

Punjab Climate Change Knowledge Centre has been set up with the support of DST, GoI. The centre has been able to strengthen capacities at all levels of Government; ensure meaningful participation of sector representatives, Research institutions/organizations including civil society and theprivate sector for integrating climate concerns, need-based projects and demonstrate appropriate technologies to enhance adaptive capacities of vulnerable sectors and dependent communities.

#### **Mission Tandarust**

The state has also set up the Directorate of Environment & Climate Change and launched Flagship ‘Mission Tandarust Punjab’ to make Punjab the healthiest state with healthy people by taking care of its air quality, water quality, and safe food, ensuring a good living environment.

### **Sustainable agriculture**

Punjab has been a long-term significant contributor to the ‘center food grain pool’ and has played an important role in sustaining the food security of the country. Acknowledging the risks to the agriculture sector due to climatic variabilities and extreme events, the Government has been directing its effort towardssuitable adaptation and mitigation measures in the domain of crops and animal husbandry.

- The government has also made significant progress in improving soil health and to date, up to 5,26,000Soil Health Cards have been issued to the farmers.
- Straw management has also been a focused aspect for which the Government has been providing strawmanagement machinery at 50% rebate to individuals and 80% to farmers'
- groups and custom hiring centers for in-situ management. This will not only aid the state to reduce pollution load but also effectively decrease the state GHG emission pool.

Punjab Government has launched the “**Paani Bachao Paise Kamao**” scheme. It is a pilot Direct Benefit Transfer scheme. The participant farmer gets a fixed allocation of electricity consumption. If the farmerconsumes less than the fixed allocation, he/she receives a benefit of INR 4 per kWh of electricity not consumed.

- The state has been recognized for re-incorporation of paddy straw into farm fields through over 28,000straw management machineries for addressing stubble burning issues thereby improving air quality& soil health.
- The Government of Punjab is also implementing a project titled “Towards Climate Resilient Livestock Production System in Punjab” in Ludhiana, Bathinda and Tarn Taran districts of the state which is funded under the National Adaptation Fund for Climate Change.

### **Sustainable Habitat**

Under AMRUT Mission, Projects worth INR 23790 million have been approved by Govt. of Punjab, andworks worth INR 5320 Million have been awarded to build the sustainable infrastructure focusing on Climate Change Adaptation.

### **Increasing Green cover in the state**

- The total forest cover in the state is 184863 ha which is 3.67% of the State's area. However, total area under forest including reserved, protected and un-classed forests reported to be 6.12%. The total carbonstock of forests in the state is 13.34 million tonne (48.91 million tonne of CO<sub>2</sub> equivalent) which is 0.19% of the total carbon stock of the country.
- Under Compensatory Afforestation Fund Management and Planning Authority (CAMPA) and Green India Mission (GIM) more than 22.6 million trees have been planted covering an area of 25179 ha. During the year 2016-2021, a total of 17560.13 ha area was covered with 14.98 million plants which benefitted more than 13000 farmers with the total financial assistance of 144.85 million and also contributed towards diversifying land by breaking the cycle of Wheat-Rice cropping.
- The state is also strategically trying to increase the green cover beyond forest areas by promoting new green initiatives including Ghar Hariyali Scheme besides promoting agro-forestry involving farmers under Sub-Mission on Agro-Forestry (SMAF). Ghar Ghar Hariyali is the State Government initiative to promote household forestry. Under this scheme, plants are raised by the forest department and supplied to the public free of cost. The forest department has developed a public domain **mobile application “ihariyali”** to facilitate people in booking their plants from forest nurseries.
- As a green initiative in Chhatbir Zoo, Government has launched “zero emission vehicles” for the visitorservice and installed a 300 KWA solar power plant directing the zoo towards a self- sufficiency in power consumption.

## **Renewable Energy for Health Sector**

Health infrastructure are major energy consumers because of their high demand for heating, ventilation, and air conditioning (HVAC), controlled temperature for use of medical equipment, lighting and 24 hours operation requirement. To add, infrastructure like the Operation Theatre, Intensive care units (ICU), Accident and Emergency (A&E) and Clinical Labs require specific temperature, humidity and air changes to be maintained throughout the period of use. Punjab Energy Development Agency in collaboration with The Energy Resource Institute and GIZ for designing sustainable Energy Solutions for Efficient Health Services in Punjab.

The government of Punjab has already recognized the need for climate change strategies and is already on the path of low carbon development. With flagship initiatives like RE-

Health, Ghar Ghar Hariyali Scheme, Municipal Green Buildings Incentives Policy, Renewable Energy for Health Sector etc. Punjab was also among the front runners in NITI Aayog SDG index.

World Health Organization describes Climate Change as the single biggest health threat facing the humanity, and health professionals worldwide. Understanding the health impacts of climate change studying the vulnerability of populations, their resilience to the current rate of climate change and the extent and pace of adaptation becomes very important. That is why SAPCCHH has been developed to represent Health in a more comprehensive manner to shape the Climate Change policy of the state.

## **State Profile of Punjab**

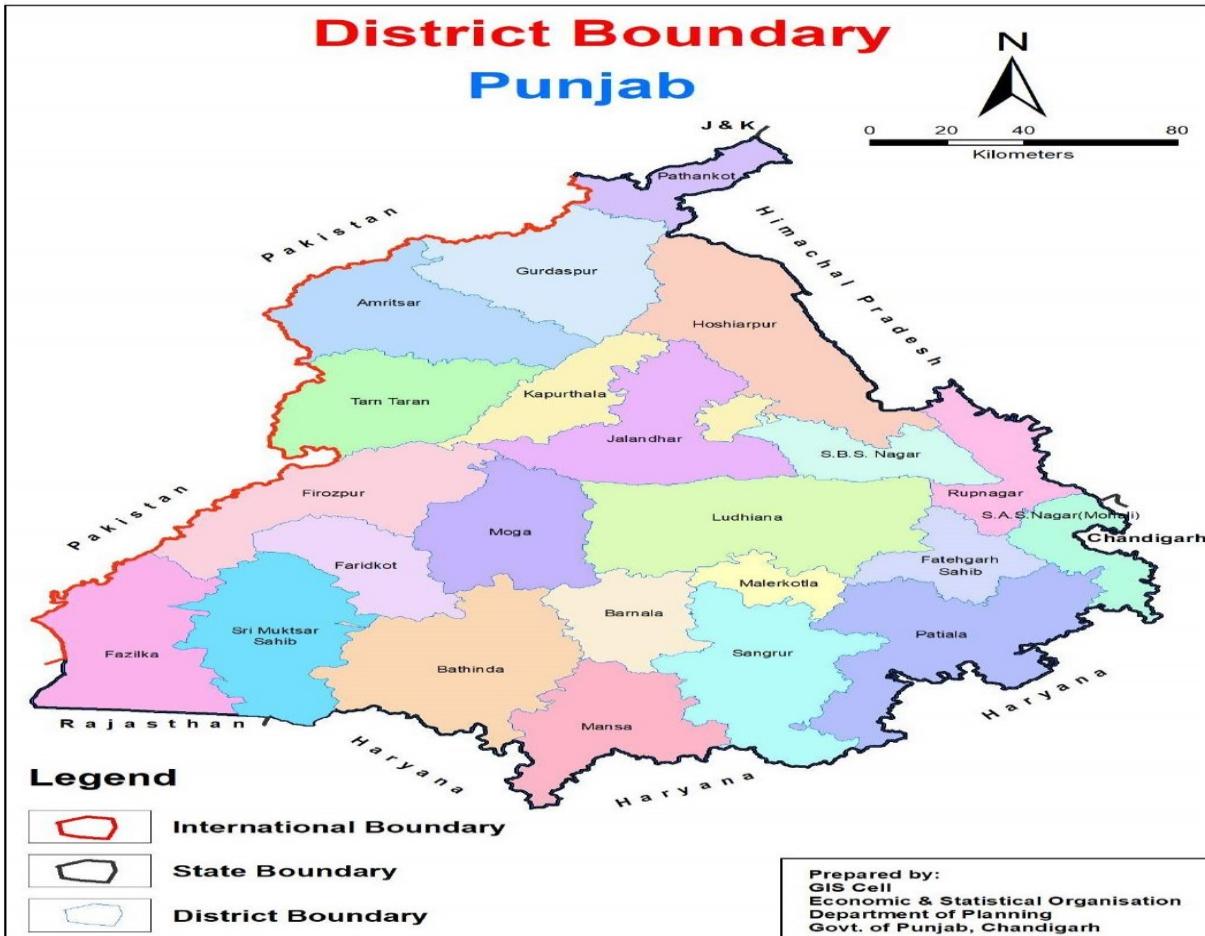
### **Geographical Profile**

Punjab lies in the north-western part of India, extending from 9.30° to 32.32° North and from 73.55° to 76.50° East. The state covers an area of 50,362 km<sup>2</sup>. Its small size lends easy accessibility to all its interior parts. There are 23 administrative districts in the state. Agriculture and allied sectors are the backbone of the rural economy of Punjab. The state has irrigation facilities which form one of the best networks in the country. Around 99.6% of gross area sown and 99.9% of net area sown are irrigated in the state. About 75% of irrigation depends on groundwater, but this is declining at an alarming rate.

There are considerable spatial differences in the climate in Punjab:

- the region lying near the foothills of the Himalayas receives heavy rainfall
- in the region lying at a distance from the hills, rainfall remains scanty and the temperature remains high.
- Maximum temperatures occur in mid-May and June with temperatures above 40°C in the entire region during this period.
- Minimum winter temperature of the region is found between December and February with an average below 5°. The districts along the Shivalik Hills, i.e., Gurdaspur, Pathankot, Hoshiarpur, and Ropar receive maximum rain.

Figure 1: District-wise boundary of Punjab



## Vulnerability profile

The present district-level vulnerability assessment was conducted for 22 districts based on 18 indicators. The list of indicators along with their functional relationships with vulnerability is presented in Table 1. Equal weights were assigned to each indicator to calculate the Vulnerability Indexes (VIs). District-level VIs are presented in table 2.

**Table 1: List of indicators used for the assessment of district-level vulnerability for Punjab**

Indicators	Adaptive Capacity / Sensitivity	Functional relationship with vulnerability
Per capita income	Adaptive Capacity	Negative
Livestock per 1000 rural population	Adaptive Capacity	Negative
Female workforce (main & marginal works)	Adaptive Capacity	Negative
Forest area per 1000 rural population	Adaptive Capacity	Negative
Yield variability of food grains	Sensitivity	Positive
Road density	Adaptive Capacity	Negative
Rural banks per 1000 rural population	Adaptive Capacity	Negative
Average person days per household employed under MGNREGA	Adaptive Capacity	Negative
Cases of vector-borne diseases per 1000 population	Sensitivity	Positive
Cases of water-borne diseases per 1000 population	Sensitivity	Positive
Number of doctors, specialists, health assistants and health workers per 1000 population	Adaptive Capacity	Negative
Infant Mortality Rate (IMR)	Sensitivity	Positive
Water Scarcity	Sensitivity	Positive
Number of NRM works per 1000 ha	Adaptive Capacity	Negative
Value of output horticulture (perennial) against value of agriculture output	Adaptive Capacity	Negative

**Table 2: List of district-level vulnerability Index for Punjab**

District	Vulnerability Index	Remarks
Tarn Taran	0.74	Relatively high Vulnerable
Moga	0.69	Relatively high Vulnerable
Gurdaspur	0.66	Relatively high Vulnerable
Barnala	0.64	Relatively Moderate Vulnerable
Mansa	0.64	Relatively Moderate Vulnerable
Ferozepur	0.63	Relatively Moderate Vulnerable
Sangrur	0.62	Relatively Moderate Vulnerable
Bathinda	0.62	Relatively Moderate Vulnerable
Kapurthala	0.61	Relatively Moderate Vulnerable
Sri Muktsar	0.59	Relatively Moderate Vulnerable
Faridkot	0.59	Relatively Moderate Vulnerable
Fazilka	0.59	Relatively Moderate Vulnerable
Patiala	0.58	Relatively Moderate Vulnerable
Jalandhar	0.58	Relatively Moderate Vulnerable
Pathankot	0.58	Relatively Moderate Vulnerable
Amritsar	0.56	Relatively Moderate Vulnerable
SBS Nagar	0.56	Relatively Moderate Vulnerable
Rupnagar	0.51	Relatively low Vulnerable
Hoshiarpur	0.51	Relatively low Vulnerable
Fatehgarh Sahib	0.48	Relatively low Vulnerable
SAS Nagar	0.48	Relatively low Vulnerable
Ludhiana	0.47	Relatively low Vulnerable

The highest value of vulnerability was obtained for Tarn Taran District (0.74) and the lowest for Ludhiana (0.47). The range of the VIs was divided into three equal intervals to obtain three categories: relatively high (0.65-0.74), relatively moderate (0.56-65), and relatively low vulnerability (0.47-0.56). After categorisation it was observed that 3 districts falls under the first category (Tarn Taran, Moga, Gurdaspur), and 14 under the second; 5 districts are in the third and the last category.

6 indicators emerged as the main drivers of vulnerability: low value of output of total horticulture (perennial) against value of agriculture output, lack of forest area per 1000 rural population, lack implementation of MGNREGA, low women's participation in workforce, a smaller number of rural banks per 1000 rural population, number of NRM works per 1000 ha. Among the 6 selected drivers, the value of output of horticulture (perennial) against the value of agriculture output has a greater NV value than the threshold in 17

districts. Further, forest area per 1000 rural population and average person days per household employed under MGNREGA were observed to be accountable for the vulnerability of 17 districts as well.

### **Health Sector Vulnerability**

Climate change can impact the health sector in numerous ways due to increase in the frequency of heatwaves, storms, and floods. The projected increase in the number of wet days combined with rise in temperature favoursthe conditions for propagation of vectors and water-borne diseases. Further, climate-induced disruption of food systems enhances the vulnerability of human population to cope with the disease burden. It is also observed thatwarmer air temperatures influence the concentration of regional air pollutants and aeroallergens, resulting in increased cases of allergies & respiratory diseases. Figure 1 provides the district health/ climate extreme vulnerability of Punjab.

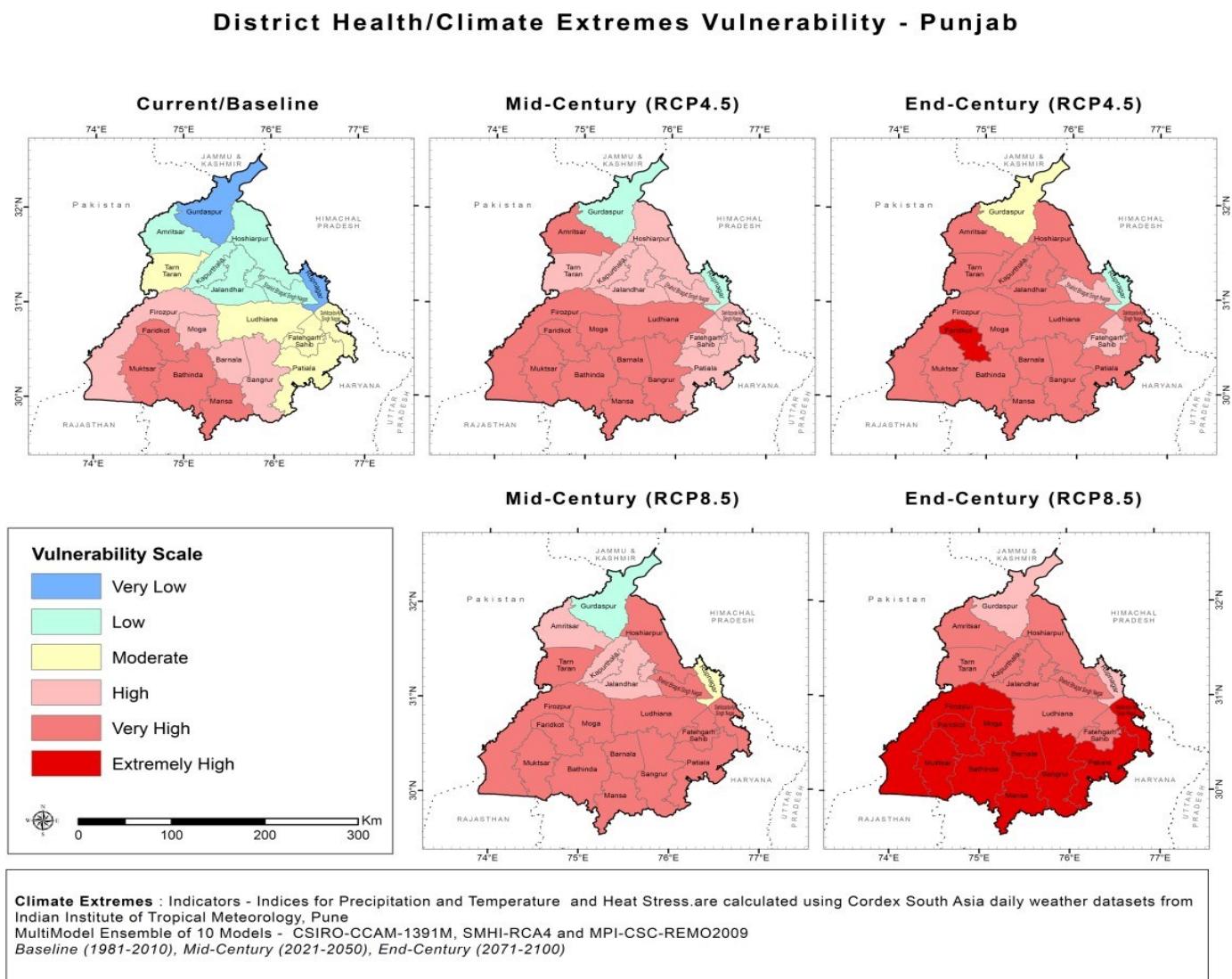
The analysis indicate that western districts namely Faridkot, Muktsar, Mansa, and Bathinda are the most vulnerable districts. Exposure to extreme events like consecutive dry days, low rainfall and rainy days andhigher sensitivity to heat stress contributes to making these districts the most vulnerable.

However, Moga, Ferozepur, Barnala and Sangrur are relatively less vulnerable districts. Whereas Gurdaspur and Rupnagar districts are the least vulnerable districts due to comparatively more rainy days, high rainfall, lower number of consecutive dry days and lower sensitivity to heat stress.

### **Projected Vulnerability**

The health sector vulnerability of the state is projected to increase towards mid-century as well as end- century in comparison to the current conditions for both the emission scenarios. However, health vulnerability is likely to exacerbate further under RCP8.5 scenario as compared to RCP4.5 scenario, towards both mid and end- century. Factors contributing to the projected increase are attributed to rainfall variability, exposure to extremely wet days, consecutive wet and dry days and higher sensitivity to heat stress.

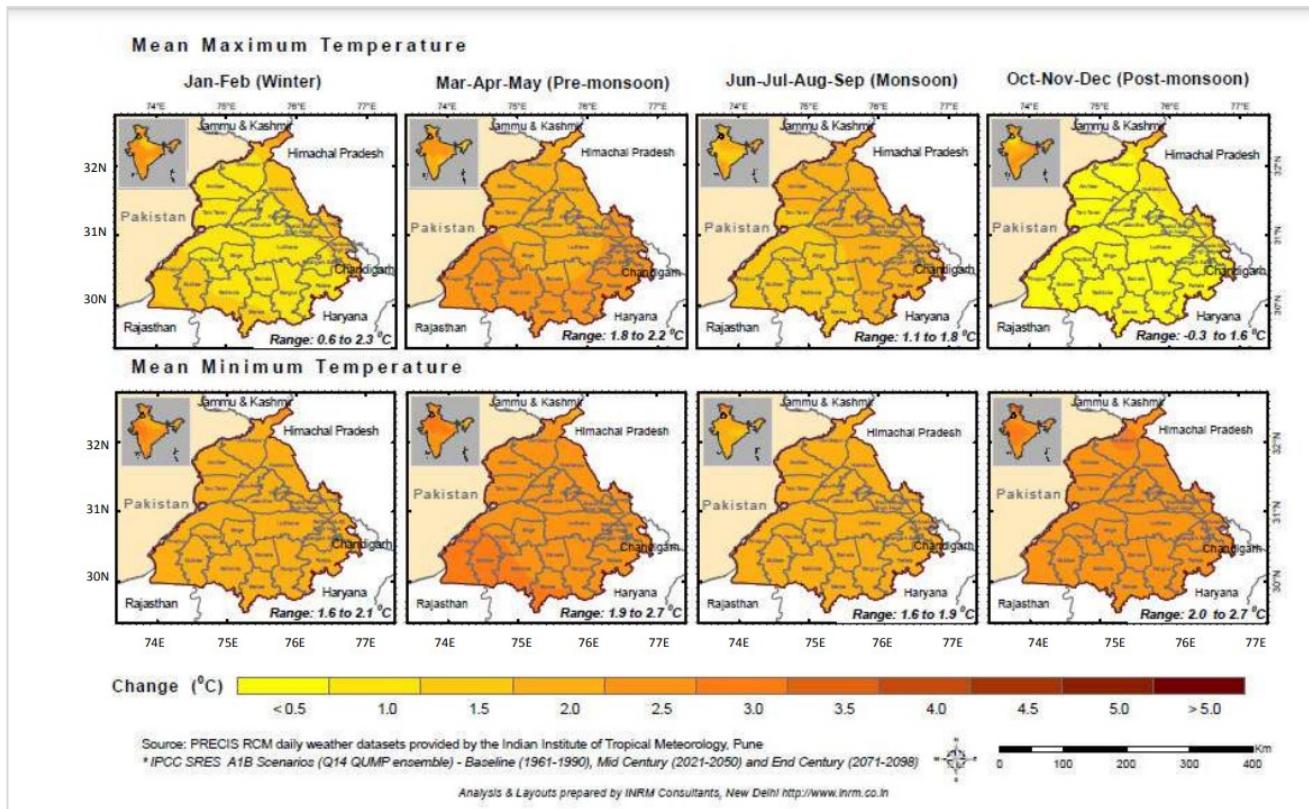
**Figure 2: Climate Vulnerability map for Punjab districts under RCP4.5 and RCP 8.5**



#### Impact of Climate Change

Women are highly vulnerable and susceptible to the impacts of climate change, owing to their intrinsic physical characteristics. The ability to cope up and adapt to various climate related hazards in a similar circumstance is different for men and women. These variations have been summarized in Table 3 below.

**Figure 3: Projected future changes in mean seasonal maximum and minimum temperatures by mid-century (2021-2050) with respect to base line (1961-1990)**



**Table 3: Climate Change Impacts and specific vulnerabilities of women**

Climate Change Impacts	Women's Vulnerabilities
Lower food production	<ul style="list-style-type: none"> <li>Lower food production can result in macro- and micronutrient deficiencies in women, especially during reproductive years, which will in turn have a long-term negative development impacts for society as a whole.</li> <li>Lower food production is expected to result in food-price hikes, which can have negative repercussions for female household heads.</li> </ul>
Reduction in water availability and declining water quality	<ul style="list-style-type: none"> <li>Having access to safe water is critical to the health of women during pregnancy and their families.</li> </ul>
More natural disasters – cyclones, floods, waterlogging and droughts; infrequent rains; intense rains	<ul style="list-style-type: none"> <li>Studies have shown that women disproportionately suffer the impacts of disasters, severe weather events, and climate change because of inequitable distribution of roles and resources.</li> <li>Women are more dependent than men on natural resources for their livelihoods and survival.</li> <li>Climate induced disaster can impact the agriculture and livestock and generate financial stress, especially in rural sector.</li> </ul>

## Climate Sensitive Diseases prevalent in the State

The socio-economic details of the population in Punjab are enlisted in the table below a per Census 20011.

**Table 4: Statistics of Punjab as per census 2011**

<b>Total population</b>	27.7 million
<b>Contribution to India population</b>	2.29%
<b>Rural area population</b>	62.51%
<b>Population density</b>	551 persons/sqkm
<b>most population district</b>	Ludhiana (3.5 million, density 975 persons/sqkm)
<b>least population district</b>	Barnala (0.6 million persons/sqkm)
<b>Sex ratio</b>	895
<b>Male literacy</b>	80.5%
<b>Female literacy</b>	70.7%
<b>Child population (0-6 Age)</b>	3.07 million
<b>No.of Workers (registered)</b>	0.75 million
<b>Adolescents</b>	4.8 million
<b>Migrant population</b>	1.8 million

**Table 5: District-wise Health Care Infrastructure in Punjab**

S. No	Name of District	Name of Medical college (Govt/ Pvt)	Name of district/ civil hospital	Number of rural/ block/ taluka/ CHC hospital	Number of PHCs	Number of Sub centers	Any other health research centre or national institute in Punjab
1	Patiala	Govt Medical College, Patiala (Govt.) Gian Sagar Medical College, Banur, Patiala	Mata Kaushalya District Hospital, Patiala	Blocks – 6/ SDH - 3/CHC - 8	6	186	Central Research Ayurvedic Institute
2	Amritsar	Govt Medical College, Amritsar (Govt.) Shri Guru Ramdass Medical	Jallianwala Bagh Martyr's Memorial	Blocks- 8/SDH - 2/CHC- 6	2	179	Nil

		College Amritsar (Private)	Civil Hospital, ASR				
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3	Mansa	Nil	DHI, Mansa	Blocks-3/ SDH-2/CHC-4	13	107	Nil
4	Fatehgarh Sahib	Nil	DH, Fatehgar h Sahib	Block- 3/ SDH- 1 /CHC-5	3	73	Nil
5	Hoshiarpur	Nil	DH Hoshiarpur	17	28	244	MRHRU BHUNGA
6	Faridkot	Guru Gobind Singh Medical College Faridkot	DH Faridkot	Blocks- 2/SDH-1/CHC-3	11	62	Nil
7	Kapurthala	Nil	DH Kapurthala	Blocks-4/SDH-3/ CHC-5	12	88	Nil
8	Fazilka	Nil	DH Fazilka	Blocks-3/SDH-2/ CHC-5	17	102	Nil
9	Bathinda	AIIMS Bathinda, AIMSR Bhuchow, Bathinda	Bhai Mani Singh Hospital Bathinda	Blocks-2/SDH-3/ CHC-6	18	142	Nil
10	SBS Nagar	Nil	DH SBS Nagar	Blocks-5/SDH-1/ CHC-4	16	95	Nil
11	Pathankot	Nil	DH Pathankot	5	10	68	Nil
12	Jalandhar	Punjab Institute Medical College	DH Jalandhar	CHC- 9/SDH- 2/UCHC- 4	15	198	Nil
13	Sangrur	Nil	Comrade Jagdish Chander Freedom Fighter Civil Hospital Sangrur	6	23	142	Nil
14	Moga	Nil	CH Moga	6	23	122	Nil
15	SAS Nagar	Dr. B.R Ambedkar State Institute of Medical Sciences	DH SAS Nagar	SDH-2/CHC-4	4	80	Nil
16	Gurdaspur	Nil	Civil Hospital Gurdaspur	RH- 1/ SDH- 1/CHC- 13	27	222	Nil
17	Ludhiana	Dayanand Medical College and Hospital	Lord Mahavir, Civil Hospital, Ludhiana	Blocks- 10/CHCs- 11	31	265	Nil

		Christian medical College and hospital					
18	Barnala	Nil	DH Barnala	4	10	71	Nil
19	Ferozepur	Nil	Civil Hospital	4	19	122	Nil
20	Malerkotla	Nil	SDH Malerkotla	RH-2/CHC-2	5	50	Nil
21	Tarn Taran	Nil	DH Tarn Taran	Blocks-8/Taluks-3/SDH- 2/CHC-11	18	153	Nil
22	Rupnagar	Nil	DH Rupnagar	Blocks-3/CHCs-4	14	86	Nil
23	Sri Muktsar Sahib	Nil	DH Muktsar	Blocks-4/SDH-3/CHCs- 5	22	103	Nil

Climate Sensitive Illnesses to be addressed for the state of Punjab are listed in figure 3.

Figure 4: Climate sensitive Illnesses.



## **SAPCCHH: Vision, Goal& Objectives**

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

**Goal:** To Reduce morbidity, mortality, injuries and health vulnerability due to climate variability and extreme weathers

**Objective:** To strengthen health care services against adverse impact of climate change on health.

### **Specific Objectives**

#### **Objective 1:**

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

#### **Objective 2:**

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

#### **Objective 3:**

To strengthen health preparedness and response by performing situational analysis at 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 **Punjab** 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

## Organizational Structure of NPCCHH in Punjab

### State Level Governing Body for Climate Change and Human Health (Notification, Annexure 2)

**Table 6: The established Structure of Governing Body in Punjab**

Designation		Name	Contact Number	e-mail id
Chairman	Hon'ble Health Minister	Dr. Chetan Singh Jaura Majra	1722741348	pbhealthminister2022@gmail.com
Vice Chairman	Principal Secretary, Health & Family Welfare.	Sh. Ajoy Sharma	2742099	<a href="mailto:pshfw@punjab.gov.in">pshfw@punjab.gov.in</a>
Member	Principal Secretary, Medical Education & Research	Sh. Hussan Lal	1722743189, 9646200015	secy.mer@punjab.gov.in
Member	Mission Director, National Health Mission	Dr. Abhinav	0172-4012011	mdnrhmpunjab@gmail.com
Member	Director, Health Services Punjab	Dr. Ranjit Singh Gothra	01722600455	Directorhealth-pb@punjab.gov.in
Member	Director, Family Welfare Punjab	Dr. Ravinderpal Kaur		<a href="mailto:dfw@punjabmail.gov.in">dfw@punjabmail.gov.in</a>
Member	Director, Medical Education & Research	Dr. Sujata Sharma	992572-09340.	Address: Plot / Street / Area SCO 87, Sector 40-C Chandigarh (District Chandigarh) Punjab, India
Member	Regional Director, (Health & Family Welfare, GOI)	Dr Ravinder Ahluwalia	9463410101	<a href="mailto:Rohfw_chd@yahoo.com">Rohfw_chd@yahoo.com</a>
Member	S.N.O –Climate Change and Human Health	Dr. Amritpal Varring	9316100004	punjabclimatechange@gmail.com

**Table 7: The established State Task Force in Punjab**

<b>Designation</b>		<b>Name</b>	<b>Contact Number</b>	<b>e-mail id</b>
Chairman	Principal Secretary, Health & Family Welfare.	Sh. Ajay Sharma	2742099	<a href="mailto:pshfw@punjab.gov.in">pshfw@punjab.gov.in</a>
Member	Chairman, Punjab Pollution Control Board	Prof. (Dr.) Adarsh Pal Vig	9815014974	chairmanppcb@yahoo.co.in
Member	Chairman, State Disaster Management Authority			
Member	Principal Secretary, Animal Husbandry	Sh. Vikas Pratap	9501502564	<a href="mailto:fcah@punjab.gov.in">fcah@punjab.gov.in</a>
Member	Principal Secretary, Dept. Of Science & Technology Environment	Sh. Rahul Tewari, IAS	9478034200	<a href="mailto:secy.te@punjab.gov.in">secy.te@punjab.gov.in</a>
Member	Mission Director, National Health Mission	Dr. Abhinav	01724012011	<a href="mailto:mdnrhmpunjab@gmail.com">mdnrhmpunjab@gmail.com</a>
Member	Secretary, Dept. Medical Education and Research	Sh. Hussan Lal	1722743189, 9646200015	<a href="mailto:secy.mer@punjab.gov.in">secy.mer@punjab.gov.in</a>
Member	Secretary, Agriculture and food security	Rajesh Vashist (Director)	9872211377	<a href="mailto:fcd@punjab.gov.in">fcd@punjab.gov.in</a>
Member	Secretary, Drinking Water and Sanitation	Amit Talwar (Director)	8968899999	<a href="mailto:secywss@punjab.gov.in">secywss@punjab.gov.in</a>
Member	Director, Department of Health and Family Welfare	Dr. Ranjit Singh Gothra	01722600455	<a href="mailto:Directorhealth-pb@punjab.gov.in">Directorhealth-pb@punjab.gov.in</a>
Member	Director, Meteorology Department	Shri. AK Singh	01722629981	<a href="mailto:chandimet@yahoo.com">chandimet@yahoo.com</a>
Member	Director, Planning and Management Department	Sumit Chopra	01722660405 9814911363	<a href="mailto:psplanning@gmail.com">psplanning@gmail.com</a>
Member	Deputy Director, Malaria	Dr. Gurinder Kaur	9888899704	<a href="mailto:dr.gagangrovar@gmail.com">dr.gagangrovar@gmail.com</a>

Member	P.O, NVBDCP	Dr. Gagandeep Singh Grover	8872090028	punjabnvdcp@gmail.com
Member	P.O, Climate Change and Human Health	Dr. Amritpal Varring	9316100004	punjabclimatechange@gmail.com
Member	State P.O, NCD	Dr. Sandeep Singh Gill	9417080588	npcdcspb@gmail.com

**Table 8: The established Structure of Environmental Health Cell in Punjab**

Post	Officer Name	Contact and Email number
Nodal Officer (Medical Officer)	Dr. Amritpal Singh	9888348882 punjabclimatechange@gmail.com
Consultant CCHH/ Assistant Programme Officer	Dr. Jasjeet kaur	9814767999 jasjit.kaur91@punjab.gov.in
Secretarial Assistants cum Data entry Operator	Manpreet Singh	9915306161

## **Part II: Adaptation plan on Climate sensitive Health Issues**

### **1. 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 is determined partly by climate and weather factors such as temperature, humidity, wind, storms, droughts, precipitation and partly by human activities known to produce various air pollutants. It is thus logical to assume that climate change will influence the dynamics of air pollution. By reducing air pollution levels, states can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.

#### **Two major types of Air Pollution: (pollution department)**

1. Ambient (Outdoor) Air Pollution
2. Household (Indoor) Air Pollution

Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide in 2012. Air pollution also affects health by causing acid rain; eutrophication due to nitrogen oxides, emission in air from power plants, cars, trucks, and other sources; Haze; toxic effects on wildlife; Ozone depletion; Crop and forest damage etc. Over 4 million people die prematurely from illness attributable to the household air pollution from cooking with solid fuels. 3.8 million premature deaths annually from non-communicable diseases including stroke, ischemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer are attributed to exposure to household air pollution<sup>41-43</sup>.

A study has been conducted by Department of Science, Technology and Environment , Government of Punjab Supported by Global Green Growth Institute and The Energy and Resource Institute (TERI), to understand the drivers and pressures responsible for the increasing levels of air pollutants in the state and the status of air quality, its impacts and the steps/interventions taken to curb this environmental issue.

Major sources of air pollution in Punjab include industries, vehicular sector and agricultural burning (CPCB, 2010; Envis Punjab, 2015). However, growth of population and various developmental activities in the state are the driving forces behind the deteriorated air quality of the state.

Air pollution through agricultural residue burning during the months of Mar-Apr and Oct- Nov largely affects both the states of Punjab and Haryana. Around 16 million tonnes of paddy and 8 million tonnes of wheat straw are burnt in the agricultural fields every year leading to air pollution in the state and nearby areas (Envis Centre, 2014)

As per sector-wise emission assessment study done for the state of Punjab by TERI (2015),

Industrial combustion contributes 47% of the PM10 emissions followed by brick and open burning. Almost 56 % of NOx emissions are contributed by transport sector in Punjab including both road transport and mode of transportation used during agricultural activities.

As per data gathered from air quality monitoring stations in the state during 2007-2012, average concentration of Respirable Suspended Particulate Matter (RSPM), NOx and SO2 were calculated across different cities in Punjab. RSPM is above the annual average standard of  $60 \mu\text{g}/\text{m}^3$  prescribed by CPCB. Ludhiana, Amritsar, Gobindgarh and Khanna cities show RSPM concentrations more than  $180 \mu\text{g}/\text{m}^3$ , which is thrice the prescribed standard. SO2 and NOx concentration in Punjab are well below the standards prescribed by CPCB.

### **Prominent causes of Ambient Air Pollution in the Punjab:**

1. Pollution by Automobiles
2. Emission from industries and power plants
3. Burning of agriculture residues in the harvest season.
4. Growing population
5. Unplanned urbanisation (construction and demolition)
6. Road dust suspension

### **Prominent causes of Household Air Pollution in the Punjab:**

1. Use of biomass, kerosene as fuel for cooking
2. Burning of waste, cow dung, coal
3. Use of incense and mosquito repellent
4. Artificial fragrances and room fresheners
5. Indoor tobacco smoking

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

<b>Table 9 : Air Quality Index (AQI) Categories</b>	
<b>Good</b>	0-50
<b>Satisfactory</b>	51-100
<b>Moderately Poor</b>	101-200
<b>Poor</b>	200-300
<b>Very Poor</b>	300- 400
<b>Severe</b>	401-500

#### **Number of Air quality monitoring stations within Punjab under NAMP:**

In State of Punjab, Ambient Air Quality is monitored at 28 locations including 4 rural area stations in Punjab under National Air Monitoring Programme (NAMP) for 24 hrs thrice a week. The list of the stations is as follow :

**Table 10: District-wise industrial and residential air quality monitoring locations**

S.N o	Cities in Punjab	Residential (R)/ Industrial (I) location
1	Amritsar	1-R and 1-I
2	Bathinda	1-I
3	Dera Bassi	2-I
4	Pathankot (Dera Baba)	1-R
5	Gobindgarh	2-R and 1-I
6	Jalandhar	2-R and 2-I
7	Khanna	1-R and 1-I
8	ludhiana	2-R and 2-I
9	Naya Nangal	2-R
10	Patiala	1-R and 1-I
11	Batala	1-I

Four stations have been set up in rural areas of village Rasulpur (Distt. Amritsar), Village Gangsar (Distt. Sangrur), Village Himmatpura, (Distt. Faridkot) and Village Mukandpur (Distt. S.B.S. Nagar) to monitor the impact of burning of agriculture residue on the ambient air quality there.

### **Number of Air quality monitoring stations within Punjab by CPCB:**

Punjab has six Continues (online) Ambient Air Quality Stations viz., Amritsar, Jalandhar, Ludhiana, Khanna, Mandi Gobindgarh and Patiala under National Clean Air Programme (NCAP) out of identified 9 non-attainment cities in Punjab by CPCB.

### **Names of Cities identified under National Clean Air Program (NCAP) in Punjab:**

Amritsar, Patiala, Jalandhar, Ludhiana, Bathinda, S.A.S Nagar, Fatehgarh Sahib, Gurdaspur, Ropar and Pathankot.

**Table 11: Awareness and Sensitization plan for Air pollution**

Activities	Quantity	Responsibility	Timeline (year wise)	Budget
Posters (example in Annexure 3)	3 Posters per facility – Following facilities will be covered: <ul style="list-style-type: none"> <li>• 23 DHs</li> <li>• 41 SDHs</li> <li>• 160 -CHCs</li> <li>• 522 PHCs</li> </ul> <b>Total Quantity - 2238</b>	<b>SNO</b> - Finalize posters, Decide quantity district-wise  <b>IEC/BCC Wing, NHM Punjab</b> – carry out translation into local language (Punjabi), put up tender for printing and deliver posters to Store keeper  <b>Store keeper, DHS</b> – distribute posters to districts as per the distribution plan provided by SNO  <b>DNOs-NPCCHH</b> – ensure the collection of posters from DHS-store and placed in districts as per distribution plan	<b>1<sup>st</sup> week of August</b>  <b>Completed within August and printing and delivery be completed by Mid-September</b>  <b>Districts to pick-up IEC material by last week of September</b>  <b>last week of September</b>	
Wall painting	Wall painting of messages to be done at Sub-centres (2951)	<b>SNO</b> - Finalize messages in Punjabi  <b>IEC/BCC Wing, NHM Punjab</b> – put up tender for wall painting  <b>DNOs-NPCCHH</b> – to inform MOs – PHCs regarding material to be printed at sub-centres	<b>1<sup>st</sup> week of August</b>  <b>Completed within August – September</b>  <b>August</b>	<b>Total Budget 4,60,000/-</b>

		<b>MOs- PHCs – to ensure that paintings are executed at Sub-Centres</b>	<b>September - October</b>	
Audio-	<ul style="list-style-type: none"> <li>audio spots 0.40sec, 035 secs,</li> <li>0.40 sec prepared at state level in Punjabi</li> <li>• 7 short video – 0.26sec, 1.07 sec, 0.23sec, 0.28sec, 0.48sec, 0.45sec, 0.25sec</li> <li>• 1 jingle</li> <li>• videos</li> </ul> <p>#Content has been already finalized</p>	SNO – finalize dissemination modes  (gurdwaras, temples, bus stands)	<b>Completed within August</b>	<b>6,00,000/-</b>
Videos (duration, languages)		<b>IEC/BCC Wing, NHM Punjab</b> –put up tender for audio-visual activity and initiate the activity 1 week prior to Diwali		
			<b>October</b>	

**Table 12: Training Calendar under NPCCHH for Acute Respiratory Illnesses**

<b>Capacity Building</b>	<b>Participants</b>	<b>Responsibility</b>	<b>Timeline</b>	<b>Budget</b>
National Level	SNO-NPCCHH APO-NPCCHH DNOs-NPCCHH Nodal Officers – Sentinel Hospitals # DNOs-NPCCHH will act as ToTs for ARI	<b>NCDC, GOI</b>	<b>August</b>	
<b>State Level</b>	DNOs-NPCCHH Nodal Officers – Sentinel Hospitals	<b>SNO via virtual mode agenda being:</b> strengthening ARI surveillance  Training schedule for MOs, ASHAs, Children, women and traffic police  Community wide awareness activity around 7 <sup>th</sup> September (International Day of Clean Air for	<b>August</b>	

		Blue Skies)		
District Level	<b>Medical Officers – facility where emergency is functional (NCAP cities) ASHAs – NCAP cities (11)</b>	<b>DNOs-NPCCHH as ToTs will train MOs  Mos will train ASHAs</b>	September	<b>5000/- per district</b>

**Table 13: ARI Surveillance Sentinel Hospitals and Nodal Officers at State Level**

S.no	Facilities	Nodal Officer	
1	SDH, Naya Nangal, Rupnagar	Dr. Vineet Kumar.	Ph: 9417164425
2	SDH, Khanna (F.G)	Dr. Arjun Bhalla.	Ph: 8708370118
3	SDH, Mandi Gobindgarh (F.G)	Dr. Navjeevan Goyal.	Ph: 8872255570
4	GMC, Amritsar	Dr. Munish Arora (Paediatrics) Dr. Kashmir Singh (Medicine)	Ph: 9569224312 Ph: 9779097760
5	Civil Hospital Ludhiana	Dr. Sukhdeep	Ph: 94638-56436
6	Civil Hospital, Bathinda	Dr. Manu Gupta (M.O)	Ph: 9876104880
7	GMC, Patiala	Dr. Kamaldeep Kaur	Ph: 9872590833
8	Civil Hospital, Jalandhar	Dr. Bhupinder	Ph: 9814143303

### **Status of ARI Surveillance data collection at Punjab**

In 2021, ARI surveillance was initiated but very few of the sentinel sites were sending the data. The data wasn't sent

daily as the format required. Therefore, quality data could not be gathered.

### **From 2022 onwards, steps taken in any to improve data collection and reporting :**

1. September Month: Daily handholding will be done to ensure that daily data is being compiled from all concerned departments at the identified Sentinel hospitals
2. October Month: Once the Data flow is established, feedback will be given on a weekly basis to ensure the quality of data doesn't downgrade.
3. Alongside DNOs will be reviewed every week to ensure that analysis (patient of acute respiratory illnesses and AQI on that particular day) is being carried out .
4. Since ARI is going to be done throughout the year from this year onwards, quarterly review will be done with the Nodal officers from the Sentinel Hospitals.

**Table 14: Air quality and impact studies in Punjab**

<b>Study</b>	<b>Result</b>
Kumar R., et al., 2015	The association between air quality in Ludhiana city of Punjab as indicated by visibility (haze) and daily mortality was found to be statistically significant.  For every 1 km decrease in visibility at midday, mortality due to natural causes increased by 2.4%.
Kumar et al., 2012	Total annual welfare loss in terms of health damages due to air pollution caused by burning of rice straw in rural Punjab amounts to 76 million.
Gupta S., et al., 2013	There exists a significant correlation between air pollution and respiratory, heart, skin, and TB diseases in both urban areas of Mandi Gobindgarh and nearby rural area.  The effect of pollution is more pronounced in urban areas of Mandi-Gobindgarh. One among every ten persons is affected by one of these abovementioned diseases
Nautiyal J. et al., 2007	The population in Gobindgarh (Industrial town) shows a higher prevalence of symptoms of angina and cardiovascular disease considered in the study as compared to Morinda (Non- Industrial) area. This result is attributed to higher levels of PM levels.

**Table 15: Five Year vision for the ARI surveillance and awareness in the State of Punjab (2022- 2027)**

<b>Timeline</b>	<b>Sentinel Sites (atleast 1 hospital in all 23 Districts)</b>	<b>Training, capacity building</b>	<b>Alert Signals</b>
<b>2022- 2023</b>	11	All MOs, to be covered from 11 NCAP districts	Establish link Between Punjab Pollution Board to send AQI alerts in 11 NCAP districts so that health facilities are quicker to response and community can be warned either via newspapers, SMS alerts, Social Media
<b>2023-2024</b>	Include 3 More districts	MOs from 3 additional districts to be trained	
<b>2024-2025</b>	Next 3 Districts	MOs from 3 next districts to be trained	
<b>2025-2026</b>	Next 3 Districts	MOs from 3 next districts to be trained	
<b>2026-2027</b>	Final 3 Districts	MOs from 3 final districts to be trained	Similar alert signal networks to be established for all districts that will be included in the surveillance in phase-wise manner.

*\*Community wise awareness activity will be carried in all 23 districts every-year to ensure that message and precautions needed to be taken get instilled in the public deeply leading to more climate friendly lifestyle changes.*

### **Hospital Preparedness:**

**A committee at the hospital level on air pollution and health to be constituted preferably including officials** from departments of Medicine, Respiratory Medicine Pediatrics, Cardiology, Neurology, Endocrinologists, etc. Including emergency and nursing division and Pharmacists.

The Committee will be responsible for development of specific action plan for hospital to address the health issues related to air pollution in its catchment areas. Such action plan will consist of activities to strengthen healthcare services in the facility in the context of air pollution, Key activities may include:

- OPD for Pediatrics/Medicine/Respiratory Medicine/Cardiology/NCD, etc. where more cases of impact of air pollution are likely to come
- Emergency services for illness related to respiratory and cardiovascular illness
- Counselling and awareness generation for friends and families of the patients
- Enhancing functional capacity for emergency, beds, drugs and diagnostics, equipments, etc.
- Enabling community outreach activities to generate awareness
- Capacity building of health professionals and workers to address health impacts of air pollution
- Establishment of surveillance mechanisms

- Strengthening supply chain and logistics to make medicines, diagnostics and equipments available, including provision for buffer stock
- Enhancing capacity and availability of oxygen cylinders, nebulizers ventilators in case of increased demand and for intensive care

### **Roles and responsibilities at various levels under NPCCHH**

<b>Designation</b>	<b>Responsibilities</b>
<b>SNO</b>	<ul style="list-style-type: none"> <li>• Finalization of IEC material and dissemination Plan</li> <li>• Organize IEC campaigns at the state level on the 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 a report of activities</li> <li>• Review implementation of IEC and surveillance activities at all levels</li> <li>• Evaluate and update relevant sections 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 the 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 Agra, Prayagraj, Amroha, Bareilly, Firozabad, G.B. Nagar, Ghaziabad, Jhansi, Kanpur Nagar, Bulandshahr, Lucknow, Moradabad, Noida, Raebareli, Hapur and Varanasi Municipal corporation.</li> <li>• Create organizational support and strengthen the 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 conferences 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 a reduction in the source of air pollution</li> </ul>

State Co Nodals (I to III)	<ul style="list-style-type: none"> <li>• Supporting SNO in planning and execution of different state-level activities.</li> <li>• Bidirectional Dissemination of Information and messages between state and districts.</li> <li>• Monitoring of NPCCHH activities in their respective allotted districts.</li> <li>• Collection and compilation of different reports from districts.</li> <li>• Any other responsibilities delegated by SNO.</li> </ul>
DNO	<ul style="list-style-type: none"> <li>• Ensure IEC dissemination to the community level</li> <li>• Facilitate community-level IEC activities</li> <li>• Conduct training for Block health officers, Medical officers, Sentinel hospital nodal officers with relevant training manuals</li> <li>• Conduct training of vulnerable groups: police officers, outdoor workers, women, children</li> <li>• Organize IEC campaigns at the district level on the 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 hotspots in health impacts</li> <li>• Submit analyzed monthly report to SNO, NPCCHH, and other departments for necessary action</li> <li>• Submit a report of activities</li> <li>• Update DAPCCHH with support from District Task Force</li> <li>• Advocate for a reduction in source of air pollution</li> </ul>
Surveillance hospital nodal officer	<ul style="list-style-type: none"> <li>• Train hospital staff and the 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</li> </ul>
Block health officer	<ul style="list-style-type: none"> <li>• Conduct community-level IEC activities</li> <li>• Ensure training of medical officers</li> <li>• Organize PRI sensitization workshops and training for vulnerable groups</li> </ul>
Medical officer	<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 the 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>
Panchayati Raj Institutions	<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>

## **Monitoring and Evaluation**

**Monitoring and evaluation** of activities will be done in-line with targets set in PIP (Refer PIP Guidelines: <https://bit.ly/NPCCHHPIP>). State will be using Quarterly Progress Report, National Programme on climate Change and Human Health (**Annexure 1**) for monitoring.

## 2. Health Action Plan on Heat and Health

Different type of heat related illness includes:

1. Minor heat related Illnesses: Heat rash, heat cramps, heat syncope
2. Major heat related Illnesses: Heat Exhaustion and heat Stroke

Punjab 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 6 during implementation of IEC and health facility preparedness.

### Heat Vulnerability in Punjab

As per the study conducted by Azhar et.al, all the districts in the state are low to very low vulnerable in the state. However, as mentioned in the above table, no. of days when heat wave was reported are steadily increasing

**Table 16: District level Heat Vulnerability in Punjab**

Sr. No.	District	Heat Vulnerability Index	Heat Vulnerability Category	Vulnerability
1	Amritsar	-2.85349	4	Low
2	Firozpur	-1.82376	4	Low
3	Moga	-3.52847	4	Low
4	Tarn Taran	-2.69078	4	Low
5	Fatehgarh Sahib	-2.83068	4	Low
6	Patiala	-2.59456	4	Low
7	Sangrur	-1.53317	4	Low
8	Faridkot	-2.01955	4	Low
9	Mansa	-0.21209	4	Low
10	Bathinda	-2.45086	4	Low
11	Barnala	-2.26762	4	Low
12	Muktsar	-2.20136	4	Low
13	Shahid Bhagat Singh Nagar	-4.8254	5	Very Low
14	Gurdaspur	-3.64402	5	Very Low
15	Sahibzada Ajit Singh Nagar	-3.66474	5	Very Low
16	Kapurthala	-3.82036	5	Very Low
17	Jalandhar	-5.38259	5	Very Low
18	Ludhiana	-3.6478	5	Very Low

19	Hoshiarpur	-5.67595	5	Very Low
20	Rupnagar	-3.85892	5	Very Low

Source: - Heat vulnerability mapping for India  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409558/pdf/ijerph-14-00357.pdf>

**Table 17: Activities undertaken to generate awareness, accessing weather data and capacity building related to heat related illness in the current heat wave season**

S.No	Activities to generate awareness, accessing weather data and capacity building		Activities done (yes/no)	Details
1.	Increasing public awareness of heat vulnerability	Assess and prioritize heat-vulnerable communities	No	
		Disseminated more information on the health effects of heat	Yes	<p>1. Heat Wave dos and don't issued in local language in all districts.</p> <p>2. IEC on heat provided by GOI have been translated into Punjabi and provided to all districts were disseminated to all link departments during District Task Force Meetings.</p> <p>3. With special focus on workers/labourers, IEC has been translated both into Punjabi and Hindi (as a big proportion is migrant population) and have sent to Mandi Board, Cooperative Bank Department and Labour Department for sensitizing them.</p>
		Launch a "heat line" call centre	No	
		Develop heat health early action response strategies	No	
		Involve link workers in	No	

		heat health campaigns			
		Disseminate public service announcements and health warnings	Yes	Announcements during heat wave warnings are made through newspaper and local gurdwaras in villages	
		Form partnerships and heat health preparedness networks	No		
2.	Improving access to weather data and heat warnings	Increase communication channels between the Met Center, Municipal corporation and the health department.	Yes	Communication have been carried out with IMD for providing historical data on trend of heat wave data in Punjab and as well district wise temperature data.	
		Work with MC and state government to install displays for temperature and weather forecasts.	No		
		Revise the current heat wave advisory thresholds	No		
3.	Building capacity in the health care infrastructure	Conduct heat vulnerability reduction trainings to increase awareness and diagnosis of heat illnesses	Provide a train-the-trainers session for primary medical officers	Yes	All DNOs- CCHH along With SMOs were trained online. The modules for online trainings were revisited during World Health Day as well as during World Environment Day.
			Create a training program or multiday workshop for health care providers, ward leaders and paramedics	Yes	Heat Related trainings were conducted by DNOs in a similar way as well as during World Health Day as well as during World environment Day celebration.
			Conduct training programs for link workers	Yes	Special awareness and sensitization were carried with various departments has been carried out.
			Increase heat stress outreach and education for women in maternity wards	No	
		Create and implement heat health guidelines	No		
		Adopt heat-focused examination procedures at local hospitals and Urban Health Centers.	No		

**Table 18: Awareness and Sensitization plan against heat**

Activities	Quantity	Responsibility	Timeline	Budget
Posters	Posters per facility – Following facilities will be covered: <ul style="list-style-type: none"><li>• 23 DHs</li><li>• 41 SDHs</li><li>• 160 -CHCs</li><li>• 522 PHCs</li></ul>	SNO - Finalize posters, Decide quantity district-wise  IEC/BCC Wing, NHM  Punjab –put up tender for printing and deliver postersto Store keeper	September  October	
	<b>Total Quantity – 2238 (3 eachfacility)</b> <ul style="list-style-type: none"><li>• Translations in Punjabi language already completed</li></ul>	Store keeper, DHS – distribute posters to districts as per the distribution plan provided by SNO  DNOs-NPCCHH – ensure the collection of posters from DHS-store and placedin districts as per distribution plan	January  February	20,000/- budget for every district for IEC activity  Total Budget 4,60,000/-
Wall painting	Wall painting of messages to be done at Sub-centres (2951)	SNO - Finalize messagesin Punjabi  IEC/BCC Wing, NHM  Punjab –put up tender forwall painting	September  October	
		DNOs-NPCCHH – to inform MOs – PHCs regarding material to beprinted at sub-centres	February	
		MOs- PHCs – to ensure that paintings are executed at Sub-Centres		

**Target population:**

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

**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))

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

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

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

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

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

**Table 19: Training Calendar under NPCCHH for Heat Related Illnesses**

<b>Capacity Building</b>	<b>Participants</b>	<b>Responsibility</b>	<b>Timeline</b>
State Level	DNOs-NPCCHH  Medical officers	SNO via virtual mode agenda being:  Strengthening HRI surveillance  Training schedule for ASHAs, Children, students and Migrant workers	<b>March</b>

		Community wide awareness activity around (World Health Day, World Environment Day)	
District Level	<b>ASHAs, Children, students and Migrant workers</b>	DNOs-NPCCHH will carry out sensitizationmeetings	<b>September</b>

### **Roles and responsibilities at various levels under NPCCHH**

Particular	Responsibilities
SNO	<ul style="list-style-type: none"> <li>• Disseminate early warnings to the 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 the IEC campaigns at the state level on observance of important environment-health days</li> <li>• Organize training sessions for the district level and the surveillance nodal officers</li> <li>• Facilitate training of medical officers in clinical aspects of the heat-health impact</li> <li>• Ensure daily surveillance reporting from the district level</li> <li>• Ensure submission and analysis of heat-related death at the 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 an emergency response to extreme heat</li> <li>• Review implementation of the 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 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>• Organize seminars and conferences 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 a report of activities on heat-health under NPCCHH</li> <li>• Advocate for the reduction in source of greenhouse gas emissions</li> </ul>
DNO	<ul style="list-style-type: none"> <li>• Disseminate early warning to block and health facility level</li> <li>• Ensure IEC dissemination to the community level and facilitate community-level IEC activities</li> </ul>

	<ul style="list-style-type: none"> <li>• Liaison with IMD to receive 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, and medical officers with relevant training manuals</li> <li>• Conduct sensitization of vulnerable groups: police officers, outdoor workers, women, children, etc.</li> <li>• Organize IEC campaigns at the district level on the 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 the 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 a report of activities on heat-health under NPCCHH</li> <li>• Advocate for the reduction in source of greenhouse gas emissions</li> </ul>
<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 workshops 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 the development and implementation of the 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>• 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>

## Strengthening Health Sector Preparedness

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

#### Surveillance guidelines and reporting formats:

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

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

- Case definitions
- HRI reporting formats: health facility to state level (forms 1 to 4)

- Death investigation form for suspected heatstroke deaths
- ii. **Reporting units:** All health facilities in a district (PHC and above) should submit daily reports from March 1-July 31 regardless of observed temperatures and rainfall using their P-form level access to IHIP.
- iii. **Surveillance training:** included under capacity building section
- iv. **Surveillance reporting and HRI monitoring:**
  - Daily monitoring of surveillance activity and health data monitoring should be done at district level in IHIP.

## v. Health Sector Preparedness

### Guidelines

- National Action Plan on Heat Related Illnesses (<https://bit.ly/NAPHRI>)
- **Advisory for State Health Departments on Heat Wave Season 2023**
- **Strengthening Health Systems Preparedness for Heat Related Illnesses (HRI) in India** (18 April, 2023)
- vi. **Revision of Health Action Plan on Heat Related Illnesses** in State Action Plan on Climate Change and Human Health (SAPCCHH): The section should be revised every year after July based on targets achieved, surveillance data, climate change impacts and health indicators with support from multi-sectoral task force.

### ➤ Heat Action Plan for Specific Cities/Rural Districts

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

### ➤ City-Specific Heat-Health Action Plans are encouraged and should supported by State EHC.

City-Specific Heat-Health Action Plans should include:

1. Early warning system and inter-agency emergency response plan:
  - a. Analysis of historic city level all-cause mortality with observed temperatures to establish health impact-based warning and response trigger (IMD, SDMA)
  - b. Daily dissemination of forecast and observed temperature during summer to public and government agencies (IMD)
  - c. Identification of roles and responsibilities of coordinating agencies with activity matrix and action checklists (Refer: Ahmedabad Heat Action Plan<sup>12</sup>)

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

#### **vii. Health facility preparedness**

The salient features of State's health facility level preparedness against heat stress are:

- Standard Operating procedures to tackle all levels of heat-related illnesses.
- Capacity building measures for doctors, nurses and other staff should be undertaken.
- Assessing cases with suspected heat stroke using standard Treatment Protocols.
- Identifying surge capacities and marking of beds dedicated to treat heat stroke victims and enhance emergency department preparedness to handle more patients.
- Identifying RRT (Rapid Response Teams) to respond to any exigency call outside the hospitals.
- Ensure adequate arrangements of Staff, Beds, IV fluids, ORS, essential medicines and equipment to cater to management of volume depletion and electrolyte imbalance.
- Establishing outreach clinics at various locations easily accessible to the vulnerable population to reduce the number of cases affected.
- Health facilities to undertake awareness campaigns for neighborhood communities using different means of information dissemination.
- Hospitals to ensure proper networking with nearby facilities and medical centres to share the patient load which exceeds their surge capacities.
- All cases of heat-related illnesses (suspected or confirmed) to be reported to NPCCHH.
- In addition, using Nation Action Plan on Heat Related Illness (NAPHRI), guidelines by MoHFW state will ensure health facility wise preparedness in all the public health facilities in the state.

As per NAPHRI, state will conduct infrastructure and logistics, capacity building and IEC/awareness activities for three different levels of health facilities, i.e., primary health centre (PHC), Community Health Centre (CHC) and District Hospital (DH)/Medical College (MC). The activities will be prioritized for three seasons, i.e., pre-heat season, heat season and post-heat season

**Monitoring and evaluation** of activities will be done in-line with targets set in PIP (Refer PIP Guidelines: <https://bit.ly/NPCCHHPIP>). State will be using Quarterly Progress Report, National Programme on climate Change and Human Health (**Annexure 1**) for monitoring

**Table 20: Five year vision for Heat Adaptation plan in Punjab (2022-2027)**

Timeline	HRI surveillance	Awareness Campaign	Alert Signals
2022- 2023	50% of districts cover all PHC upto District Hospital Facilities	DNOs to start including schools in their awareness exercise (20% in each district) Create Environmental Volunteers (EVs) in each of the School	Local Newspapers in districts to start giving heat wave alerts .
2023-2024	100%		
2024-2025	Based on temperature trend, 5 districts will be selected where HRI corners will be established in school Public and private ( with the help of DCs and Education department	DNOs will cover next 20% in each district year wise thus completing 100 percent by end 2027)	Alert system to be established where principals to be can be informed and therefore outdoor activities can be re-scheduled accordingly (games period, Recess time and morning and even assembly time)
2025-2026	Based on implementation of exercise the previous year, additional districts and more schools will be added to the list		
2026-2027	Similar activity will be further enhanced		

**\*EVs can act as support for DNOs to ensure repeated awareness and active steps are taken in schools to become environment friendly and conscious.**

### 3. Health Action Plan on Vector-Borne Disease in Context of Climate Change

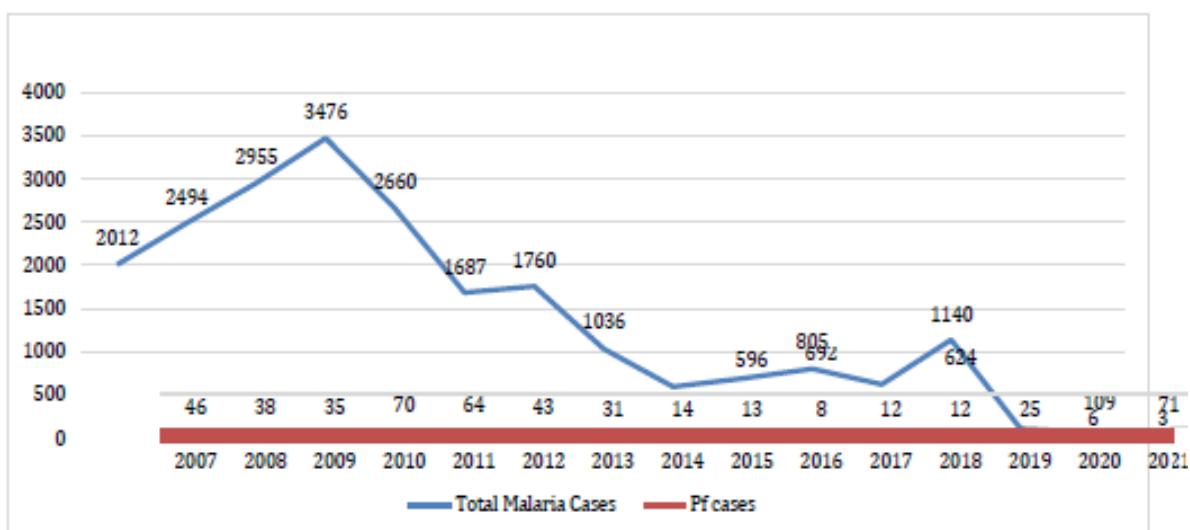
National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme for prevention & Control of 6 Vector borne Diseases, namely:

- a. Malaria
- b. Dengue
- c. Chikungunya
- d. Japanese Encephalitis
- e. Filariasis
- f. Kala Azar

#### Malaria:

Malaria is mainly reported from rural areas of the state. As per classification of GOI, Punjab is in Malaria Elimination phase as the State and all the districts have API (Annual Parasite Incidence) less than 1 for last more than 5 years.

Figure 5: Year-wise distribution of Malaria cases in Punjab, 2007-2021

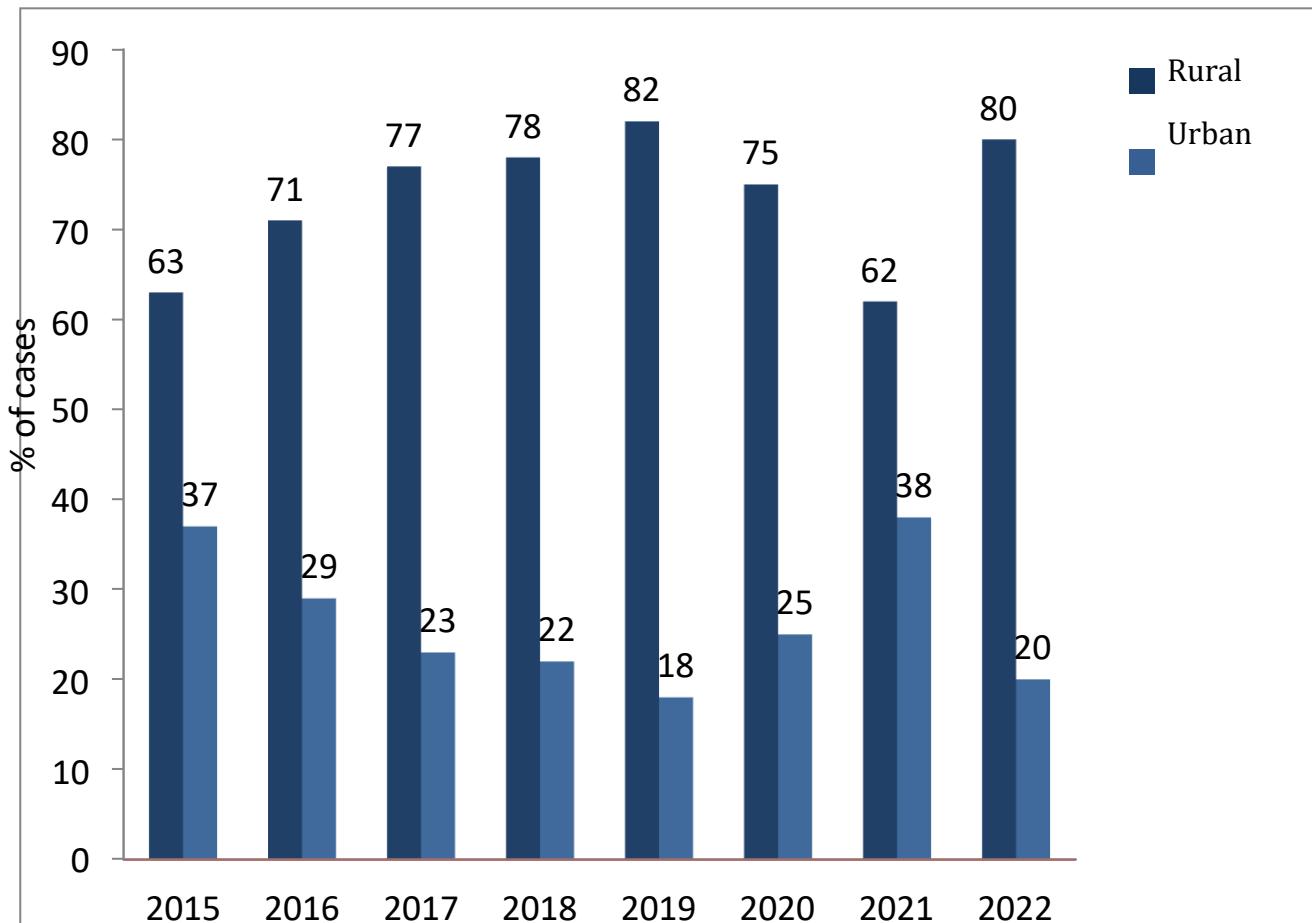


### **Surveillance Status:**

As per target of Malaria Elimination, all the districts & State have to have zero indigenous case of Malaria for 3 consecutive years which will be certified by WHO. 10 Districts i.e. Amritsar, Barnala, Fatehgarh Sahib, Ferozpur, Jalandhar, Sangrur, Tarn Taran, Kapurthala, SBS Nagar and Patiala reported Zero indigenous case of Malaria in 2021.

For management of severe malaria, 25 Sentinel surveillance hospitals have been identified at 22 District Hospitals and 3 Govt. Medical Collages. Testing and treatment of malaria is free of cost.

Figure 6: Distribution of malaria cases by type of Residence, Punjab, 2015-2021

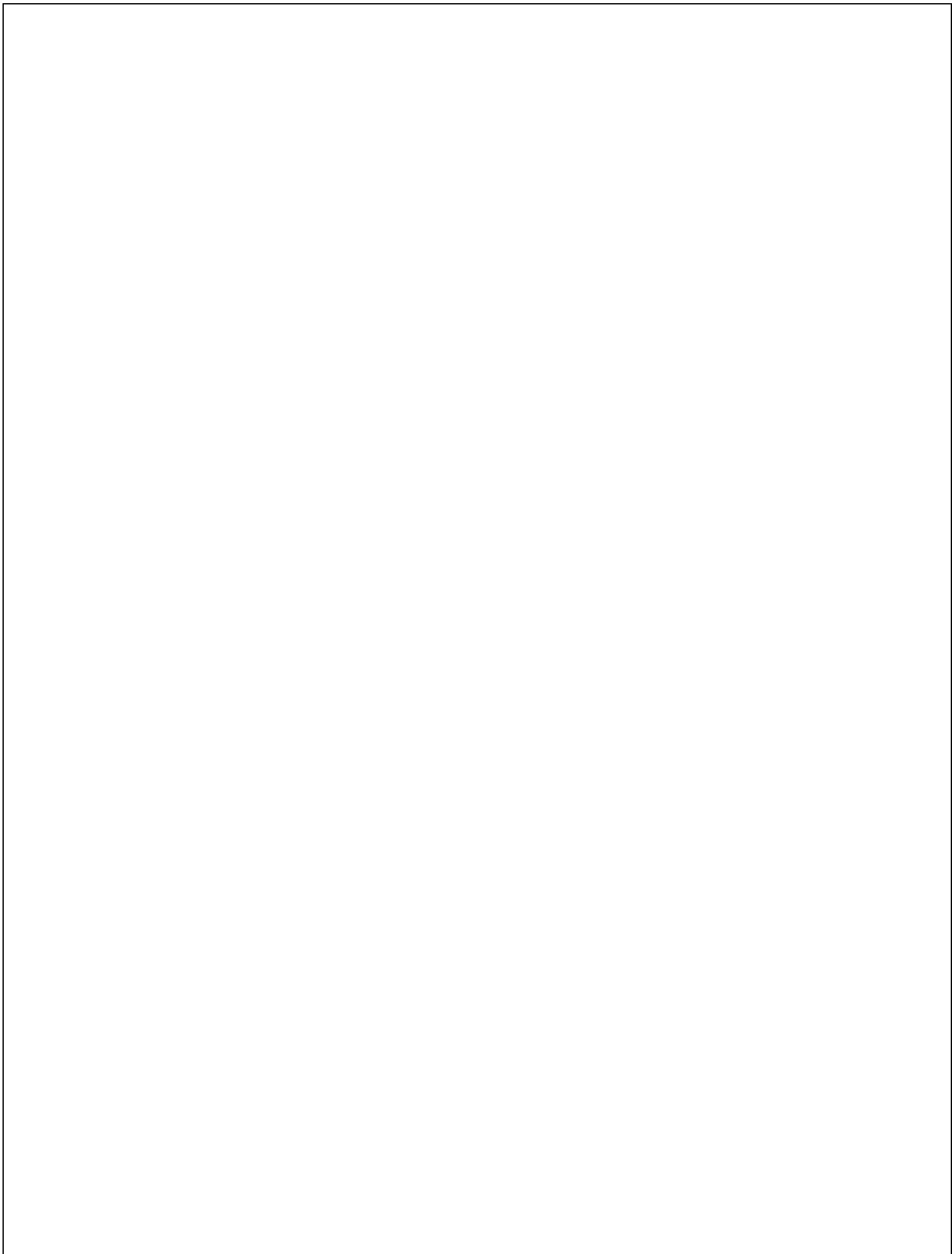


### **Dengue:**

It is a viral disease. It is transmitted by the infective bite of aedes (Aegypti/ Albopictus) mosquito. Man develops disease after 5-6 days of being bitten by an infective mosquito. District-wise Dengue case load is asfollow in table 18.

**Table 21: District -wise dengue cases in Punjab (2017-2021)**

District	2017	2018	2019	2020	2021
Amritsar	222	697	1116	371	1687
Barnala	231	242	319	19	127
Bathinda	557	706	665	576	2620
Faridkot	451	1072	169	424	1009
Fatehgarh Sahib	802	334	350	451	376
Fazilka	270	112	661	875	280
Fereozpur	520	306	316	599	257
Gurdaspur	226	221	819	195	750
Hoshiarpur	1280	490	460	298	1729
Jalandhar	455	704	385	236	650
Kapurthala	995	605	441	98	870
Ludhiana	1083	489	1509	1355	1829
Mansa	679	1185	123	482	159
Moga	539	292	462	448	135
Pathankot	651	151	119	119	1792
Patiala	2434	2332	261	307	1013
Rupnagar	309	784	232	166	774
S.A.S Nagar	2472	1079	354	470	3949
S.B.S Nagar	250	625	439	169	505
Sangrur	548	1704	434	147	523
Sri Muktsar Sahib	348	783	134	185	2110
Tarn Taran	76	96	402	445	308
<b>Total</b>	<b>15398</b>	<b>15009</b>	<b>10170</b>	<b>8435</b>	<b>23389</b>



## Information, Education Communication (IEC) Activities

**i. Target population:**

- **Areas identified** based on disease distribution and hotspot
- **Vulnerable groups** (Primarily children, pregnant women, older adults, immunocompromised, outdoor workers/vendors)

**ii. Annual IEC dissemination plan for Vector-borne diseases in context of climate change under NPCCCHH, Punjab**

<b>IEC type</b>	<b>Material</b>	<b>Timeline</b>	<b>Mechanism</b>
Posters	<ul style="list-style-type: none"> <li>• Posters on VBD and climate change (English/Hindi) <a href="http://bit.ly/NPCCHH_IEC">bit.ly/NPCCHH_IEC</a></li> <li>• May update posters made by state NVBDC</li> <li>• Posters on VBD and climate change (Punjabi) (Annexure 6)</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>
Wall painting	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>
Hoardings	<ul style="list-style-type: none"> <li>• Posters in Punjabi (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>
Audio-Visual	<ul style="list-style-type: none"> <li>• 3 Audio Jingles</li> <li>• Audio Jingle</li> <li>• 2 Video messages (Hindi, English)</li> <li>• Video message (Punjabi)</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<sup>11</sup> and in coordination with NVBDCP</li> </ul>

Bus painting	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>
Digital display	<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>
Social medial	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>

### **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>IEC Campaigns</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>Collaborate with NVBDCP</p>

### **Capacity Building Activities**

#### i. Training material

**Training modules:** (available [bit.ly/NPCCHHguidelines](http://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:** NPCCHH channel <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 Ajay Paswan, Medical Officer, Contact detail -9427717776

*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, Punjab

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

**Strengthening Health Sector Preparedness**

➤ **Integrate weather parameters with VBD surveillance under NVBDC at District level**

- Monitor VBD with weather paramerts
  - Initiate surveillance based on predicted expansion of vectors to pick up emerging foci with support form 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, Punjab**

<b>Department/Agency</b>	<b>Area of Collaboration</b>	<b>Specifics</b>
1. NVBDCP, Punjab	Overall guidance and policy formulation	<ul style="list-style-type: none"> <li>• Guide and the state governments in resurgence and containment of any VBD</li> </ul>
2. State Nodal Officer, Climate Change	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. India Meteorological Department	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>
4. NGO at state and district level for	Heath education at community level	<ul style="list-style-type: none"> <li>• Conduct workshops for IEC activities for different level of staff in the</li> </ul>

reach to community		identified areas in consultation with the state govts
5. State Programme Officer	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. State Entomologist	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. Chief Medical Officer/District Malaria Officer/Disease Surveillance officer	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. Media	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.

#### **Five year vision for Health Adaptation plan for Vector Borne diseases:**

1. Develop early warning system in Punjab in coordination with NVBDCP and meteorlogical department.
2. Carry-out awareness campaign in the state through posters, wall paintings, and social media to create awareness among the public on how climate change is impacting the timeline, infectivity, type of vector and severity of disease in comparsion to previous decades.
3. Creating a data flow where vector borne diseases also get analysed with climate variables in a daily basis.

#### **4. Health Action Plan on Extreme Weather Events and their impacts on Health**

States and UTs may have recorded raised morbidity and mortality due to effect of extreme weather conditions viz frequent and severe episodes of heat waves, floods, droughts and fires as a direct impact of climate variability and affecting population at large.

Climate change can result in more hot days, resulting in more periods of 'drought', 'dust storms', or 'heavy rains (precipitation)', and even 'flooding'. The health gets directly affected due to injuries, hypothermia, hyperthermia, drowning and indirectly through population dislocation, crowding, poor

living conditions, faeco-oral transmission of gastro-intestinal pathogens causing water and food borne illnesses, respiratory illness and other infectious diseases (e.g., leptospirosis, vector-borne disease, cholera and also mental illnesses). The reason primarily is due to contamination of water and sewage disposal.

Punjab is vulnerable to various types of hazards. The following are the major disasters faced in the state:

- **Atmospheric & Geological Events:** A major part of geographical area of the state is prone to floods although substantial part has been protected through flood control measures. Other occasional events like hailstorms, lightening, squall, thunderstorm, heat Wave, cold Wave, dust storm etc. cause huge damages to the standing crops.

In Punjab, damages due to floods are caused mainly by the river Ravi, Sutlej and Ghaggar, which is a common delta where floodwaters blend and cause damage. The problem is further accentuated when flood synchronises with high tide. The site deposited constantly by these rivers in the delta area raises the bed levels and the rivers often overflow their banks or break through new channels causing heavy damages.

Punjab state lies in zone III and IV which are broadly associated with seismic intensity on VII and VIII on MMI scale respectively. As per earthquake hazard zoning map, about 50 per cent area in north Punjab, comprising Amritsar, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Patiala and Rupnagar districts is zone IV liable to MSK intensity 8 and about 45 per cent in zone III could have intensity 7 on the Richter scale.

- **Water Logging:** The water table is rising in south-western districts of the state due to limited or non-extraction of groundwater because of blackish/saline quality, which makes it unfit for domestic, irrigation and other purposes which causes water logging.

The topography of the entire area of Muktsar and Malout, which is saucer shape and impedes surface drainage system both natural and artificial, the constant seepage from the twin canals and return flow from canal irrigation, are some of other contributory factors towards creating water logging problem.

- **Drought:** The primary causes of drought include low rainfall or inadequate snow pack the preceding winter. However, other factors may also contribute to drought conditions including land degradation and an increase in water demand. An increase in water demand may be a result of increased population or industry, but can also result from water used for fire-fighting. Technological failure of human-built water supply system can also lead to drought like conditions, though this is often of a localized nature.

- Desertification & Soil Erosion:** The desertification in Punjab is due to faulty agriculture practices such as excessive use of fertilizers and improper irrigation techniques and without proper long-term soil conservation strategy.

Further, the state also has problem of soil erosion due to intensive cultivation, deforestation and destruction of the natural vegetation by grazing or other means. The Kandi tract in Rupnagar district of Punjab state has undulating topography, inadequate ground water, steep slopes, bare land surface and, thus, severe problems of soil erosion.

#### **Enlist the causes of different diseases prevalent during disasters in the state**

1. Skin rashes
2. Tetanus
3. Leptospirosis
4. Gastroenteritis
5. Fever
6. Eye infections/allergies
7. Skin allergies
8. Wound infections

#### **Enlist the causes of different water borne diseases in the state:**

1. Contamination of water supply with flood water and sewerage water
2. Presence of heavy metals in the water supply due to industrial pollution or the over-use of agricultural chemicals.
3. Contaminated food

#### **Priority Districts for diseases prevalent during disasters in Punjab:**

S.No	District	S.No	District
1.	Ferozpur	5.	Moga
2.	Fazilkha	6.	Rupnagar
3.	Jalandhar	7.	S.B.S Nagar
4.	Kapurthala	8.	Tarn Taran

#### **Priority District wise Morbidity, Mortality and related statistics of diseases prevalent during disasters in the state**

	District	Ferozpur	Fazilkha	Jalandhar	Kapurthala	Moga	Ropar	S.B.S Nagar	Tarn Taran
No. of Cases detected	Gastroenteritis	0	397	654	108	346	12	24	1648
	Fever	8	75	516	19	136		45	1081
	No of Blood Slides/RDT	1	732	188	136	86		42	1535

	Malaria	1	0	0	0	0	0	0	1
	Dengue	0	0	0	0	0	0	0	0
	ANC	15	1	26	11	16	2	29	117
	Under 5 Children	32	67	171	70	345	12	72	969
	Dog Bite	4	0	0	0	0		0	5
	Snake Bite	0	0	1	0	1	0	0	4
	Skin allergies	58	151	772	582	136		24	2254
	Eye infections/allergies	15		170	28	50		17	505
	<b>Hypertension</b>	37	155	475	79	308	11	121	1392
	<b>Diabetes</b>	45	194	220	78	236	5	90	947
	<b>CVD</b>	0	0	0	0	0	0	0	16

#### **Current activities carried out in Punjab in preparation of disasters**

- Monthly health camps are being organized in the districts close to river beds for diseases that commonly occur during flooding season. The report received is as follow:

S. No.	District Name	No. of Original Villages affected	Current Effectively Villages	Blocks	No. of Population affected	Current Population effected	No. of Rapid Response Teams	No. of Medical Camps	Total No. of OPDs attendance
1	<b>Ferozpur</b>	20	0	3	2124	0	13	71	3636
2	<b>Fazilka</b>	4		2	38310	0	7	49	1582
3	<b>Jalandhar</b>	46	0	4	54714	0	13	242	5577
4	<b>Kapurthala</b>	62	0	2	9450	0	5	155	5018
5	<b>Moga</b>	6	0	1	4450	0	4	68	1744
6	<b>Ropar</b>	48	0	4	34249	0	26	167	7679
7	<b>S.B.S Nagar</b>	6		1		0	25	37	57
8	<b>Tarn Taran</b>	8		3	450	0	14	94	1384
	<b>Total</b>	<b>200</b>	<b>0</b>	<b>20</b>	<b>143747</b>	<b>0</b>	<b>107</b>	<b>883</b>	<b>26677</b>

B) Awareness activity being carried out IDSP is accelerated in flood affected areas

C) Flooding tends to hamper immunization, the immunization programme also increases its awareness campaign to ensure that immunization percentages doesn't get affected.

D) All procurement of essential drugs is done and made available at district level with additional

power to districts to procure drugs locally if the need may arise.

E) Public health advisories are issued during the cold wave season in all languages ( Punjabi, English and Hindi)

#### **Five year vision under Adaptation plan on Disaster management**

<b><u>Timeline</u></b>	<b><u>Activity</u></b>	<b><u>Responsibility</u></b>
2022-2023	<ul style="list-style-type: none"> <li>• Develop IEC in local language</li> <li>• Training of DNOs on disaster management and what role they can play in preparing for them at health facility level and educate community.</li> </ul>	SNO-NPCCHH PO-Disaster Management PO IEC/BCC
2023-2024	<ul style="list-style-type: none"> <li>• IEC activity to be done in all districts affected by flooding</li> <li>• Cold wave IEC to be done in all districts</li> <li>• DNOs to train MOs</li> </ul>	SNO-NPCCHH DNOs PO IEC/BCC
2024-2025	<ul style="list-style-type: none"> <li>• Taking awareness campaign to ASHAs</li> <li>• Health facility mapping to be done most affected by flooding in priority districts</li> </ul>	DNOs and MOs
2025-2026	<ul style="list-style-type: none"> <li>• Improving awareness campaign.</li> <li>• Initiating Civil work in facilities most affected in phased manner</li> </ul>	Public works Department Punjab health system Corporation SNO-NPCCHH, PO disaster management and DNOs will carry out the coordination work
2026-2027	<ul style="list-style-type: none"> <li>• Continuing awareness Campaign and developing flood resilient healthcare facilities.</li> <li>• Initiating project on mapping earthquake prone healthcare facilities</li> </ul>	Public works Department Punjab health system Corporation SNO-NPCCHH, PO disaster management and DNOs will carry out the coordination work

## 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

IEC type	Material	Timeline	Mechanism
Advisory	<a href="http://bit.ly/NPCCHHPrg">bit.ly/NPCCHHPrg</a>	Seasonal	By email to DNO for further dissemination to health facilities
Early warning	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>
Posters	<ul style="list-style-type: none"> <li>• 6 posters on various EWE and health impacts (English, Hindi) <a href="http://bit.ly/NPCCHHIEC">bit.ly/NPCCHHIEC</a></li> <li>• Posters on heat and health impacts (Punjabi)</li> </ul>	Seasonal, As needed	<ul style="list-style-type: none"> <li>• Printing of _____ copies 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>
Wall painting	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>
Hoardings	<ul style="list-style-type: none"> <li>• Posters in Punjabi (above)</li> </ul>	Seasonal, As needed	<ul style="list-style-type: none"> <li>• To be planned Municipalities</li> </ul>
Audio-Visual	<ul style="list-style-type: none"> <li>• Audio Jingle</li> <li>• </li> <li>• 5 Video messages (Hindi, English) <a href="http://bit.ly/NPCCHHIEC">bit.ly/NPCCHHIEC</a></li> <li>• Video message</li> </ul>	Seasonal, As needed	<ul style="list-style-type: none"> <li>• Played seasonally and around relevant extreme weather events</li> </ul>
Bus painting	Using available material	Painted in June-July, Seasonally as needed	With GSRTC and Corporation city Bus service

Digital display	<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
Social medial	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
• International Day for Disaster Risk Reduction	<p>IEC Campaigns</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>Health facility level activities</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:** NPCCHH channel <https://bit.ly/NPCCHHyt>

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

**ii. Annual training plan for Extreme Weather Events and Health under NPCCHH**

<b>Training Programme for</b>	<b>Trainer</b>	<b>Topics</b>	<b>Timeline</b>
<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 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

### **iv. 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**

	<b>Responsibilities</b>
SNO	<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 institute/s 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>
DNO	<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></ul>

	<ul style="list-style-type: none"> <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</li> <li>• 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>
Block health officer	<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>
Medical officer	<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>
Panchayati Raj Institutions	<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>

## **5. Health Adaptation Plan for Green and Climate Resilient Healthcare**

### **Introduction**

Health care facilities (HCF) are the first and last line of defense against the drivers of the health impact of climate change. They provide essential services and care to the population affected by extreme weather events and long-term climate hazards (adaptation) and conversely, require to reduce their own contribution to the climate change producing greenhouse gas (GHG) emissions (mitigation). Healthcare system resilience is defined as the capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, informed by lessons learned during the crisis, reorganise if conditions require it. It is imperative to build health systems and facilities to withstand the impacts of climate change while deploying climate-smart health care as an anchor strategy to achieve more equitable access to care, resulting in healthy, resilient communities.

Building resilience and contributing to environmental sustainability are major components to strengthen the HCF to continue functioning with minimal negative environmental and health impacts. The National Programme on Climate Change and Human Health (NPCCCHH) 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 –

- Energy
- WASH (water, sanitation, hygiene)
- Water Conservation
- Waste management
- Infrastructure development (retrofitting)

### **Implementation Arrangement**

The implementation of clean and green guidelines will be the responsibility of the Infection and Prevention Control (IPC) Committee at the healthcare facility (HCF) level coordinated by a state-level IPC committee as per the mandate of the Kayakalp guideline. This committee will include representatives from all relevant disciplines or departments in the facility headed by an elected chairperson who is the HCF administrator or a person who has direct access to the head of the Healthcare Facility. The IPC Committee meetings would take place monthly for infection prevention and control in the health facility (including building, services, site, and the access road) while the agenda for clean and green facilities could be discussed quarterly and or as often as required.

Detailed institutional mechanism to be provided here-

1. Committee and responsible authorities and chain of reporting at HCF level
2. Institutional details linking the HCF to district and state level reporting

<b>Green Measures in Healthcare facilities</b>	<b>Unit</b>	<b>Cost/facility</b>	<b>2022-23</b>	<b>Justification</b>
<b>Energy Audit will be conducted in DH</b>	4	100,000	400,000	Selected 4 District Hospitals in 4 districts in FY 2022-2023
<b>Energy Audit will be conducted in CHC</b>	26	30000	780,000	26 CHCs in 4 districts for FY 2022-23
<b>Energy Audit will be conducted in PHC</b>	1	10,000	10000	1 PHC in 1 district in FY 2022-2023
<b>TOTAL</b>			<b>11,90,000</b>	
<b>Replace existing Lighting Non LED with LED in DH</b>	2	200,000	400,000	Selected 2 District Hospitals in 2 districts in FY 2022-2023
<b>Replace existing Lighting Non LED with LED in CHC</b>	10	75,000	375,000	Selected 5 Community Health Centres in 2 Districts FY 2022-23
<b>TOTAL</b>			<b>77,50,00</b>	

<b>Green Measures in Healthcare facilities</b>	<b>Unit</b>	<b>Cost/per facility</b>	<b>2022-23</b>	<b>Justification</b>
<b>Installing Solar panels at DH</b>	4	10,00,000	40,00,000	Selected 4 District Hospitals in 4 districts in FY 2022-2023
<b>Installing Solar panels at CHC</b>	3	500,000	15,00,000	Selected 3 CHC in 3 Districts FY 2022-23
<b>TOTAL</b>			<b>5,50,000</b>	
<b>Installing Rainwater harvesting System DH</b>	2	300,000	600,000	Selected 2 District Hospitals in 2 districts in FY 2022-2023
<b>Installing Rainwater harvesting System CHC</b>	1	200,000	200,000	Selected 1 CHC in 1 District FY 2022-23
<b>TOTAL</b>			<b>800,000</b>	
<b>Climate Resilient Healthcare facility</b>	1	500,000	500,000	Selected 1 District Hospitals in 1 district in FY 2022-2023

## **Strengthening Health Sector Preparedness**

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

- New HCF should be built in compliance with Green & Climate Resilient Infrastructural features as of updated IPHS
- 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<sup>13</sup>, <https://bit.ly/NPCCHHIP>)
  - o Flood resilient measures
  - o 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

**i. Guidelines**

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

**District wise plan for implementation of greening in Public health facilities in Punjab for year 2022-2023**

	Amritsar EA	Price /unit	TOTAL	Bathinda EA	Price /unit	TOTAL	Energy Audit
<b>DH</b>	1	1,00,000	100000	1	1,00,000	100000	
<b>CHC</b>	6	30,000	180000	5	30,000	150000	
<b>PHC</b>	1	10,000	10000	0	10,000	0	
<b>TOTAL</b>	8		290000	6		250000	
	Amritsar LED	Price /unit	TOTAL	Bathinda LED	Price /unit	TOTAL	LED
<b>DH</b>	1	2,00,000	200000	1	2,00,000	200000	
<b>CHC</b>	3	75,000	225000	2	75,000	150000	
<b>PHC</b>	0	25,000	0	0	25,000	0	
<b>TOTAL</b>	4		425000	3		350000	
	Gurdaspur SP	Price /unit	TOTAL	Bathinda SP	Price /unit	TOTAL	Solar Panel
<b>DH</b>	1	10,00,000	1000000	1	10,00,000	1000000	
<b>CHC</b>	1	5,00,000	500000	0	5,00,000	0	
<b>TOTAL</b>	2		1500000	1		1000000	
	Amritsar RWH	Price /unit	TOTAL	Bathinda RWH	Price /unit	TOTAL	
<b>DH</b>	1	3,00,000	300000	1	3,00,000	300000	Rainwater Harvesting
<b>CHC</b>	1	2,00,000	200000	0	2,00,000	0	
<b>TOTAL</b>	2		500000	1		300000	
	Jalandhar RF						Retro fitting
<b>D H</b>	1						
<b>Total expenditure</b>	5		<b>500000</b>				

	Jalandhar EA	Price /unit	TOTAL	Ludhiana EA	Price /unit	TOTAL	Total	Energy Audit
DH	1	1,00000	100000	1	100000	100000		
CHC	7	30,000	210000	8	30,000	240000		
PHC	0	10,000	0	0	10,000	0		
<b>TOTAL</b>	8		310000	9		340000	<b>1190000</b>	
DH								LED
CHC								
PHC								
<b>TOTAL</b>							<b>775000</b>	
	Jalandhar SP	Price /unit	TOTAL	Ludhiana SP	Price /unit	TOTAL		Solar Panel
DH	1	1000000	1000000	1	1000000	1000000		
CHC	1	500000	500000	1	500000	500000		
<b>TOTAL</b>	2		1500000	2		1500000	<b>5500000</b>	
DH								Rainwater Harvesting
CHC								
<b>TOTAL</b>							<b>800000</b>	
D H								Retrofitting
<b>Total expenditure</b>							<b>500000</b>	
				<b>Grand total</b>			<b>87,65,000</b>	

## Five-year vision for Developing green and climate resilient health facilities in Punjab

<b>Timeline</b>	<b>Capacity building</b>	<b>Greening Measures</b>
2022-2023	<p>TERI and Punjab Energy Development Agency (PEDA) will be carrying out training need assessment in Health sector</p> <p>Training Modules will be prepared by TERI to understand health and energy linkages for the medical professionals</p> <p>Responsibility: TERI in support from PEDDA Coordination Role: SNO-NPCCHH</p>	<p>As per targets received by GOI following measures will be carried:</p> <ul style="list-style-type: none"> <li>Energy Audit</li> <li>Solarization</li> <li>LED replacement</li> <li>Rainwater harvesting instalment</li> </ul> <p>Responsibility: PEDDA in support from PHSC Coordination Role: SNO-NPCCHH</p>
2023-2024	<p>All 23 DNOs to sensitized to the concept of climate resilient healthcare facilities</p> <p>Responsibility: SNO-NPCCHH Resource partner: TERI and PEDDA</p>	
2024-2025	<p>DNOs will train MOs covering 25% each year and 25% ASHAs to increase adoption of environment friendly energy consumption in the community.</p>	
2025-2026		
2026-2027	<p>Increasing the target by 25% each year to reach 100% in next 3 years</p>	<p>In phased manner every year greening targets will be increased by 10% every year over the next 4 years.</p>

## Part III Budget

### Budget Proposal for next 5 years under NPCCHH programme

S.No	Activities	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027
1	Infrastructure & Civil works for Climate resilient health care facilities New	5 Lakh	10 Lakh	15 Lakh	15 Lakh	15 lakh
2	Capacity Building (Training)	2.5 lakh	2.5 lakh	4.6 lakh	4.6 lakh	4.6 lakh
3	Other including operation costs (OOC) Green measures	87.65 lakh	99.65 lakh	109.62 lakh	120.58 lakh	132.64 lakh
4	IEC & Printing	15 lakh	16.5 lakh	18.15 lakh	20 lakh	22 lakh
5	Planning & Monitoring & Evaluation (including District task Force meeting)	4.8 lakh	2.7 lakh	4.6 lakh	4.6 lakh	4.6 lakh
6	Surveillance, Research, Review Evaluation (SRREE)	2.5 lakh	2.5 lakh	2.75 lakh	3 lakh	4 lakh

## Annexure 1: Quarterly Progress Report Format, NPCCCHH

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

<b>Programme Activities /Deliverable</b>		
<b>1 Constitution of State Governing Body (SGB)</b>		
A If State Governing Body (SGB) constituted?	Yes/No	
B If Yes, provide O.M. of constitution of SGB	Annexed (Yes / No)	
C SGB meeting held in past quarter	Yes/No	
D Minutes of last meeting held	Date of Meeting / /	Annexed (Yes / No)
<b>2 Formation of State Multisectoral Task Force (SMTF)</b>		
A If State Multisectoral Task Force (SMTF) formed?	Yes/No	
B If Yes, provide O.M. of constitution of SMTF	Annexed (Yes / No)	
C SMTF meeting held in past quarter	Yes/No	
D Minutes of last meeting held	Date of Meeting / /	Annexed (Yes / No)
<b>3 Establishment of Environmental Health Cell (EHC)</b>		
A If State has established EHC?	Yes/No	
B If Yes, provide O.M. of establishment of EHC	Annexed (Yes / No)	
C If Yes, provide list of members	Annexed (Yes / No)	
<b>4 State Action Plan on Climate Change and Human Health (SAPCCCHH)</b>		
A If State has submitted SAPCCCHH?	Yes/No	
B If Yes, version number of SAPCCCHH	No:	Month/Year ____/____
<b>5 Designated District Nodal Officer -Climate Change (DNO-CC)</b>		
A If State has identified DNO-CC in all districts?	Yes/No	
B No of Districts in State/UT		
C No of Districts appointed DNO-CC		
D O.M. of appointment of DNO-CC's	Annexed (Yes / No), If Yes, No of Districts _____	

<b>6</b>	<b>Formation of District Multisectoral Task Force (DMTF)</b>				
A	If District Multisectoral Task Force (DMTF) formed?			Yes/No	
	No of Districts appointed DTF				
B	If Yes, provide O.M. of constitution of DMTF			Annexed (Yes / No), If Yes, No of Districts _____	
C	DMTF meeting held in past quarter			Yes/No, If Yes, No of Districts _____	
D	Minutes of meeting held in past quarter			Annexed (Yes / No)	If Yes, No of Districts _____
<b>7</b>	<b>Capacity Building of State &amp; District Nodal Officers on Climate Change</b>				
A	Have the SNO attended the TOT?			Yes/No	
B	Have the Consultant/s attended the TOT?			Yes/No	
C	Whether the training has been conducted on Climate Change and Human Health in past quarter for			DNO -CC	Yes/No
				Medical Officer	Yes/No
				Health Workers	Yes/No
D	No of health care professionals trained in past quarter on Climate change and Human Health			<b>Health care personnel</b>	<b>No of trained</b>
				DNO -CC	
				Medical Officer	
				Health Workers	
E	<b>Training on Air pollution</b>		<b>Training on Heat Related Illnesses</b>		
	<b>Health care personnel</b>	<b>No of trained</b>	<b>Health care personnel</b>	<b>No of trained</b>	
	DNO -CC		DNO -CC		
	Medical Officer		Medical Officer		
	Health Workers		Health Workers		
F	<b>Training on any other Climate issues</b>			<b>Health care personnel</b>	<b>No of trained</b>
				DNO -CC	
				Medical Officer	
				Health Workers	
G	No of Sensitization workshop/ meeting at State level on CC&HH matters in past quarter			No :	Report Annexed (Yes / No)
H	No of Sensitization workshop/ meeting at District level on CC&HH matters in past quarter			No :	Report Annexed (Yes / No), If Yes, No _____
I	Training of Panchayat Raj Institutions in past quarter			No of Blocks :	
				No of activities held:	Report Annexed (Yes / No), If Yes, No _____
<b>8</b>	<b>IEC in past quarter</b>				
<b>A</b>	<b>At Block level in past quarter</b>				
	<b>Pollution</b>	<b>Total No</b>	<b>Heat</b>	<b>Total No</b>	<b>Other Climate issues</b>
	No of audio		No of audio		No of audio
	No of video		No of video		No of video
	No of social media		No of social media		No of social media

	No of posters		No of posters		No of posters			
<b>B</b>	<b>At District Level in past quarter</b>							
	<b>Pollution</b>	<b>Total No</b>	<b>Heat</b>	<b>Total No</b>	<b>Other Climate - issues</b>	<b>Total No</b>		
	No of audio		No of audio		No of audio			
	No of video		No of video		No of video			
	No of social media		No of social media		No of social media			
	No of posters		No of posters		No of posters			
<b>C</b>	<b>At State level in past quarter</b>							
	<b>Pollution</b>	<b>Total No</b>	<b>Heat</b>	<b>Total No</b>	<b>Other Climate issues</b>	<b>Total No</b>		
	No of audio		No of audio		No of audio			
	No of video		No of video		No of video			
	No of social media		No of social media		No of social media			
	No of posters		No of posters		No of posters			
<b>9</b>	<b>Observation of public health days related to Climate Change in past quarter</b>							
A	World Environment Day observed?		Yes/No /Not Applicable					
	If Yes, report submitted with details		Report Annexed Yes/No					
B	International day of Clean Air and Blue Skies observed?		Yes/No/Not Applicable					
	If Yes, report submitted with details		Report Annexed Yes/No					
C	Other events observed in past quarter		YES/No					
	If Yes, report submitted with details		Report Annexed Yes/No					
<b>10</b>	<b>Printing in past quarter</b>							
A	No of Training modules printed in past quarter							
B	IEC printed							
C	Others printed		Details.. Yes/No					
C	Articles contributed to NPCCHH Newsletter for past quarter activities		Attached.. Yes /No					
<b>11</b>	<b>Budget</b>							
A	Total budget sanctioned in ROP for Financial Year (Rs in lakhs)**							
B	Total received by SNO for expenses in FY							
C	Total budget spent till the end of past quarter (Rs in lakhs)							
D	Total budget distributed to districts ( <b>for all the districts</b> )		District 1	OM Annexed (Yes / No)				
			District 2	OM Annexed (Yes / No)				
	<b>At the State level</b>							

	<b>FMR code</b>	<b>Activities</b>	<b>Budget Received</b>	<b>Quarter I</b>	<b>Quarter II</b>	<b>Quarter III</b>	<b>Quarter IV</b>	<b>Total Expenditure</b>
<b>1</b>	3.3.3.3	Training of PRI						
<b>2</b>	5.1.1.2.13	Greening						
<b>3</b>	9.2.4.9	Training of MO's, Health workers, Programme Officer's						
<b>4</b>	10.2.14	Surveillance						
<b>5</b>	11.4.7	IEC						
<b>6</b>	12.17.3	Printing						
<b>7</b>	16.1.2.1.23	Task force Meeting						
<b>8</b>	16.1.2.1.24	Review of DNO-CCHH with SNO-CCHH						
<b>9</b>	16.4.1.5.2	Consultant-CCHH						
<b>Date of submission</b>				<b>Signature of SNO</b>				

**Annexure 2: Notifications of Governing Body and Multisectoral Task Force Formation**

GOVERNMENT OF PUNJAB  
DEPARTMENT OF HEALTH & FAMILY WELFARE,  
(HEALTH-IV BRANCH)  
NOTIFICATION

No 16/46/86-3HB-IV/ 1139621 | | Dated Chandigarh the; 02/01/2018

Vide this notification, following committees are constituted for preparation of State Action Plan for Climate Change and Human Health (SAPCCHH).

A) State Level Governing Body of SAPCCHH, Punjab

The constitution of State Level Governing Body of SAPCCHH will be as following:-

- |                    |  |
|--------------------|--|
| • Chairman         | Hon'ble Health Minister                          |
| • Vice Chairman    | Principal Secretary Health & Family Welfare      |
| • Member Secretary | Director Health & Family Welfare                 |
| • Member           | Principal Secretary Medical Education & Research |
| • Member           | Mission Director – National Health Mission       |
| • Member           | Director Medical Education & Research            |
| • Member           | Regional Director Health and Family Welfare      |
| • Member           | State Surveillance Officer - IDSP                |

B) State Level Task Force of SAPCCHH

The constitution of State Level Task Force of SAPCCHH will be as following:-

- |                    |  |
|--------------------|--|
| • Chairman         | Principal Secretary Health & Family Welfare                    |
| • Member           | Mission Director – National Health Mission                     |
| • Member           | Chairman, State Disaster Management Authority                  |
| • Member           | Chairman, Punjab Pollution Control Board                       |
| • Member           | Secretary, Department of Agriculture                           |
| • Member           | Secretary, State Ground Water Board                            |
| • Member           | Director, Department of Local Government                       |
| • Member           | Director Health & Family Welfare                               |
| • Member           | Director, Meteorological Department                            |
| • Member           | Environmental Engineer   |
| • Member           | Deputy Director Malaria  |
| • Member           | State Programme Officer NVBDCP                                 |
| • Member           | State Programme Officer, Disaster Management, Deptt. Of Health |
| • Member           | State Surveillance Officer – IDSP                              |
| • Member Secretary | Cum Nodal Officer SAPCCHH                                      |

The State Level Task Force of SAPCCHH shall be working under the guidance of Principal Secretary Health & Family Welfare. It shall be directly overseeing the implementation of State Action Plan for Climate Change and Human Health (SAPCCHH) in the State. It shall be working through the Directorate of Health Services (DHS), which will be the implementing agency for State Action Plan for Climate Change and Human Health (SAPCCHH).

The State Level Task Force of SAPCCHH will meet minimum thrice in a year and prepare the Action Plan for Climate Change and its impact on Health of the human beings and it will recommend the activities to be undertaken to the State Level Governing Body of SAPCCHH. The members of State Level Task Force of SAPCCHH

Continue.....

From pre page:-

-2-

prepare the action plan for climate change and its impact on health of the human beings. It will recommend the activities to be undertaken to the State Level Governing Body of CCHH. The members of State Level Task Force of CCHH can be increased or changed as per orders of Chairman.

DHS will create an Environmental Health Cell within the State Health Department.

Place : Chandigarh  
Dated: 24.09.2019

Anurag Agarwal  
Principal Secretary to Government of Punjab  
Department of Health & Family welfare, Punjab

NO. 16/46/86-3HB-IV/ 1585095/2 - 13 Dated, Chandigarh the; 24/9/19

A Copy of the above is forwarded to the following for information:-

- 1) PS to Health Minister Punjab.
- 2) Financial Commissioner, Department of Revenue, Rehabilitation and disaster management Govt of Punjab.
- 3) Chairman, Punjab Pollution Control Board , Punjab.
- 4) Secretary, Department of Agriculture Govt of Punjab.
- 5) Secretary, State Ground Water Board Govt of Punjab.
- 6) Director, Department of local Government, Govt of Punjab.
- 7) Director, Health & Family welfare, Punjab.
- 8) Director, Meteorological Department, Chandigarh.
- 9) Environment Engineer, Punjab Pollution control Board.
- 10) Deputy Director malaria, Department Health & Family welfare, Punjab.
- 11) State Programme Officer Disaster Management deptt of Health & F.W.
- 12) Regional Director, ( Health & Family Welfare, GOI).

*Under*  
Under Secretary to Government of Punjab  
Department of Health & Family welfare, Punjab

NO. 16/46/86-3HB-IV/ Dated, Chandigarh the;

A Copy of the above is forwarded to the following for information:-

- 1) All the Commissioners of Division in the State of Punjab.
- 2) All the Deputy Commissioners in the State of Punjab.
- 3) The Managing Director, Punjab Health Systems Corporation, Punjab. Mohali.
- 4) The Managing Director, National Health Mission, Punjab, Chandigarh.
- 5) The Director, Health & Family welfare, Punjab. Chandigarh.
- 6) The Director, Health Services (FW), Punjab, Chandigarh.
- 7) The Director, Health Services (SI), Punjab, Chandigarh for circulation in all the institutions ESI.
- 8) The Director Research and Medical Education, Punjab, Chandigarh.
- 9) The Accountant General (A&E) Punjab, Chandigarh.

*Sd/-*  
Under Secretary to Government of Punjab  
Department of Health & Family welfare, Punjab

NO. 16/46/86-3HB-IV/

Dated, Chandigarh the;

A Copy of the above is forwarded to the Controller Printing & Stationery Punjab, Chandigarh, along with two attested copies for publishing the above notification in the Punjab Govt. Gazette and for supplying 50 copies of the same to this department.

*Sd/-*  
Under Secretary to Government of Punjab

Punjab 05-11-19  
250 (667)

GOVERNMENT OF PUNJAB  
DEPARTMENT OF HEALTH & FAMILY WELFARE  
(HEALTH - IV BRANCH)

STC 25043

NOTIFICATION

NO. 16/46/86-HB-IV/1 Dated 15/10/1986

Dated Chandigarh, the 15th October 1986

Vide this notification following committees are constituted for preparation of Climate Change and Human Health (CCHH).

C) State level Governing Body of Climate Change and Human Health  
The constitution of State level Governing Body of CCHH will be as following:-

- Chairman - Hon'able Health Minister  
• Vice Chairman - Principal Secretary, Health & Family Welfare.  
• Member - Principal Secretary, Medical Education & Research  
• Member - Mission Director, National Health Mission  
• Member - Director, Health Services Punjab  
• Member - Director, Family Welfare Punjab  
• Member - Director, Medical Education & Research  
• Member - Regional Director, (Health & Family Welfare, GOI)  
• Member - S.N.O - Climate Change and Human Health

State Level Governing Body meeting will be held once a year.

D) State Task Force of Climate Change and Human Health

The constitution of State Task Force of CCHH will be as following:-

- Chairman - Principal Secretary, Health & Family Welfare  
• Member - Chairman, Punjab Pollution Control Board  
• Member - Chairman, State Disaster Management Authority  
• Member - Principal Secretary, Animal Husbandry  
• Member - Principal Secretary, Dept. of Science & Technology  
Environment  
• Member - Mission Director, National Health Mission  
• Member - Secretary, Dept. Medical Education and Research  
• Member - Secretary, Agriculture and food security  
• Member - Secretary, Drinking Water and Sanitation  
• Member - Director, Department of Health and Family Welfare  
• Member - Director, Meteorology Department  
• Member - Director, Planning and Management Department  
• Member - Deputy Director, Malaria  
• Member - P.O, NVBDCP  
• Member - P.O, Climate Change and Human Health  
• Member - State P.O, NCD

The State Level Task Force of Climate Change and Human Health (CCHH) shall be working under the Chairpersonship of Principal Secretary Health & Family Welfare. It shall be directly overseeing the implementation of State Action Plan for Climate Change and Human Health (SAPCCHH) in the State. It shall be working through the Directorate of Health Services (DHS), which will be the implementing agency for State Action Plan for climate Change and Human Health (SAPCCHH).

The State Level task Force of CCHH will meet minimum twice in a year and

Continue.....

can be increased or changed as per orders of Chairman.  
DHS will create an Environmental Health Cell within the State Health Department.

Place: Chandigarh  
Dated: 27 December, 2017

ANJALI BHAWRA  
Principal Secretary to Government of Punjab  
Department of Health & Family Welfare, Punjab

No. 16/46/86-3HB-IV/

Dated, Chandigarh

A copy of the above is forwarded to the following for information:-

- 1) PS to Health Minister Punjab
- 2) Financial Commissioner, Department of Revenue, Rehabilitation and Disaster Management, Govt. of Punjab.
- 3) Chairman, Punjab Pollution Control Board, Punjab.
- 4) Secretary, Department of Agriculture, Govt. of Punjab.
- 5) Secretary, State Ground Water Board, Govt. of Punjab.
- 6) Director, Department of Local Government, Govt. of Punjab.
- 7) Director Health & Family Welfare, Govt. of Punjab.
- 8) Director, Meteorological Department, Chandigarh.
- 9) Environmental Engineer, Punjab Pollution Control Board.
- 10) Deputy Director Malaria, Department of Health & Family Welfare, Punjab
- 11) State Programme Officer, Disaster Management, Deptt. Of Health
- 12) State Surveillance Officer, IDSP, Department of Health & Family Welfare, Punjab

Additional Secretary to Government of Punjab  
Department of Health & Family Welfare, Punjab  
No. 16/46/86-3HB-IV/ 1137081/14-22 Dated, Chandigarh 02/01/2018

A copy of the above is forwarded to the following for information and compliance:-

- 1) All the Commissioners of Divisions in the State of Punjab.
- 2) All the Deputy Commission in the State of Punjab.
- 3) The Managing Director, Punjab Health Systems Corporation, Punjab, Mohali.
- 4) The Managing Director, National Health Mission, Punjab, Chandigarh.
- 5) The Director Health & Family Welfare Punjab, Chandigarh.
- 6) The Director Health Services (FW), Punjab, Chandigarh.
- 7) The Director Heath Services (SI), Punjab, Chandigarh for circulation in all the institutions under ESI.
- 8) The Director Research and Medical Education, Punjab, Chandigarh
- 9) The Accountant General (A & E) Punjab, Chandigarh.

Additional Secretary to Government of Punjab  
Department of Health & Family Welfare, Punjab

No. 16/46/86-3HB-IV/

Dated, Chandigarh

A copy of the above is forwarded to the Controller Printing & Stationery Punjab, Chandigarh, along with two attested copies for publishing the above notification in the Punjab Govt. Gazette and for supplying 50 copies of the same to this department.

Additional Secretary to Government of Punjab  
Department of Health & Family Welfare, Punjab



• Outline for group work by state representatives

The state team may preferably comprise of representatives / experts from

- State Health ministry
- Environment, Forest & Climate Change Ministry
- ICMR
- Meteorological department
- Disaster management authority
- Environmental engineer/ Scientist
- Agriculture ministry
- Ground water board

Most of the states have their State Action Plan for Climate Change, wherein health may be updated based on following statistics or details of states

- Based on mapping/ vulnerability assessment for health, List & prioritise climate sensitive illnesses occurring in their state/region (emerging or reemerging).
- Statistics related to
  - Vulnerable population:
  - Geographical factors affecting climate sensitive illnesses
  - Health care infrastructure/ facilities
  - Current burden and distribution of climate related health outcomes
  - Other factors contributing to increase/ decrease of climate sensitive illnesses
  - How effective are current health and other sector policies and programmes to manage the climate sensitive illnesses

## ਪ੍ਰਦੂਸ਼ਿਤ ਹਵਾ ਦਾ ਸਿਹਤ ਤੇ ਪ੍ਰਭਾਵ

### ਬੋਚੇ ਸਮੇਂ ਲਈ ਪ੍ਰਭਾਵ

- ਨਿਰ ਦਰਦ, ਚੀਜ਼ਾਂ ਅਧੀਨਾ
- ਖੋਡੀ ਵਿੱਚ ਜਲਣ
- ਪੰਥਾਂ
- ਸਾਹ ਦਾ ਝੁਲਕਾ
- ਰਸਤੀਂ ਤੇ ਜਲਣ

### ਜਿਆਦਾ ਸਮੇਂ ਲਈ ਪ੍ਰਭਾਵ

- ਬੋਚੀ ਲੰਬਾਕ ਜੰਗ (ਸਟੋਂਚ) \*
- ਫਿਲ ਦੇ ਰੋਗ (ਵਿਲ ਦਾ ਰੋਗ) \*
- ਸਾਹ ਦੇ ਰੋਗ (ਲਾਗ ਰੋਗ, ਮੌਹਰਾਇਸ਼) \*
- ਪੋਰਾਲਜ਼ ਦੇ ਕੀਲਾਂ ਦਾ ਪੜਾ \*



### ਪ੍ਰਦੂਸ਼ਿਤ ਹਵਾ ਤੋਂ ਖੁਦ ਨੂੰ ਕਿਵੇਂ ਬਚਾਈਏ



ਕਾਰ ਹਾਲ ਦੇ ਪੀਂਘ ਵਾਲੀ ਕੁਲਾਂਗਾਂ ਵਿੱਚ ਹੋ।



ਗੈਂਡ-ਗੈਂਡ ਵਾਲੀਆਂ ਕਾਨਾਂ ਦੇ ਕੋਂ



ਵਿਲੀਆਂ ਵਾਲੀਆਂ ਕਾਨਾਂ ਦੇ ਕੋਂ



ਗੈਂਡ ਕੁਲਾਂਗਾਂ ਦਾ ਵਿਲੀਆਂ ਵਾਲਾ



National Programme for Climate Change and Human Health

ਸਿਹਤ ਤੇ ਪਰਿਵਾਰ ਭਲਾਈ ਵਿਤ੍ਤਾਗ, ਪੰਜਾਬ





ਪੰਜਾਬ ਦੀ  
ਸਰੋਤ ਮੁਹਾਰੀ  
ਗੁਰੂ ਨਾਨਕ ਦੇਵ



ਪੰਜਾਬ ਸਰਕਾਰ  
ਅਧਿਕਾਰੀ  
ਗੁਰੂ ਨਾਨਕ ਦੇਵ



## ਸਾਡੇ ਤੇ ਨਾ ਪਏ ਭਾਰੀ ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਸੁਚੇਤ ਰਹੋ ਬਿਮਾਰੀ ਦੇ ਲੱਛਣਾਂ ਨੂੰ ਯਾਦ ਰੱਖੋ ਅਤੇ  
ਸਾਫ਼ਪਾਣੀ ਕਰਓ



ਗਰਮੀ ਦੀ ਰੋਗ,  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ

ਜੇਕਰ ਤੁਸੀਂ ਜਾਂ ਹੋਰ ਕੋਈ ਬੀਮਾਰ ਮਹਿਸੂਸ ਕਰੋ ਤਾਂ



ਗਰਮੀ ਦੀ ਰੋਗ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ

ਭਾਕਟਰ ਕੋਲ ਜਾਓ ਜਾਂ ਐਂਡੂਲੋਸ ਝੁਲਾਓ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ



ਗਰਮੀ ਦੀ ਰੋਗ  
ਗਰਮੀ ਵਾਲੀ ਬਿਮਾਰੀ



ਗਰਮੀ ਦੀ ਰੋਗ



ਪੰਜਾਬ ਸੰਘ ਅਧੀਨ ਸੇਵਾ

ਪੰਜਾਬ ਸਰਕਾਰ ਦੀ ਯੋਗ ਵਿੱਚ

**ਫੋਨ ਨੰਬਰ : 104**

24 X 7 ਦੀ ਯੋਗ ਵਿੱਚ

**ਸਿਹਤ ਤੇ ਪਰਿਵਾਰ ਭਲਾਈ ਵਿਭਾਗ, ਪੰਜਾਬ**