स्वास्थ्य एवं
परिवार कल्याण मंत्रालय
MINISTRY OF
HEALTH AND
FAMILY WELFARE
सत्यमेव जयते

सत्यमेव जयते
त्रिपुरा सरकार

TRIPURA

STATE ACTION PLAN ON CLIMATE CHANGE AND HUMAN HEALTH







National Centre for
Disease Control
Government of India

National Programme
on Climate Change
and Human Health

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2022-27

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PART I

Climate Change and its Health Impacts

CHAPTER 1
Introduction

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

Climate change may negatively affect human health in a number of ways, but the most commonly experienced are increased frequency and intensity of heat waves leading to a 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. Besides these, there is an increase in transmission and spread of infectious diseases, changes in the distribution of water-borne, food-borne and Vector-borne diseases and effects on the risk of disasters and malnutrition.

The *United Nations Framework Convention on Climate Change (UNFCCC)* came into force on 21st March 1994. Since then many steps 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 a signatory to "*Male' Declaration"* wherein the 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 & made climate-resilient, particularly in promoting 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, health department has to undertake measures to initiate the greening of the health sector by adopting environment-friendly technologies, and using energy-efficient services.

Initiatives undertaken by the Government of India are: a) Identification of Ministry of Environment, Forest & Climate Change (MOEF&CC) as nodal ministry; b) Formulation of National Environmental Policy 2006; c) Formulation of Prime Minister's Council on Climate Change for matters related to Climate Change.

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

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

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, Delhi, conducted four regional consultations in 2017-18 involving all the states and Union Territories of the country. Regional consultations aimed at sensitizing states and Union Territories on reassessment of diseases' morbidity and mortality with respect to climate variability and extremes have been conducted. These regional consultations had participations from ministries and departments of states and UTs including Senior Regional Directors, Regional Directors from Regional Office of Health & Family Welfare, State Nodal Officers, State Surveillance Officers, National Vector-borne Diseases Control Programme, Officers from Integrated Diseases Surveillance Programme, representatives from identified Centre of Excellence, representatives from Regional Centre of Meteorological Departments, Ministry of Environment Forest and Climate Change and Central Ground Water Board.

Tripura is one of the mountainous states of the Indian Union. Elevation varies from 300 meters to more than 8000 meters within the 113 km North South extension and 64 km East West extension makes the steep gradient topography of the state. The geographical area of Tripura is 7096 sq km. Landslides and flashfloods are common during the rainy season. In addition, the state is located in a tectonically active area in Himalayas, where the earthquake is frequent phenomenon. In this scenario the state population is directly or indirectly vulnerable to climate change. Its impacts are seen in the form of unusual weather and climate phenomena like the drought, heavy rainfall, melting of the glaciers and ice masses etc., which results in various kind of natural disasters, extinction of plant and animal species, decrease of food production which ultimately affects the survival of human beings.

Therefore, climate change and its impacts are likely to pose serious impact on the life of the people in this Himalayan state. This situation makes the state vulnerable to climate change.

CHAPTER 2

Climate Vulnerability in the State

Although the state is small with a population of only over three million, Tripura is the 2nd most populous state in the North Eastern Region. The social composition of the population of Tripura is diverse. Around one-third of the population belongs to the Scheduled Tribes. According to 2011 census, the state's population is 36.74 lakhs, with a density of 350 persons per sq km. Population pattern and demography have always been fluctuating. In 1901 Tripura's population was 1.73 lakh, with tribals making up nearly 52.89% of the whole. By 1941, the total population rose to 5.13 lakhs with a barely 50.09% tribal majority. But by 1981, the tribal population dipped to 28.44% out of a total population of 2.05 million because of several socio-political developments.

Total number of households have increased from 664334 in 2001 to 855556 in 2011 (increased by 28.8%) whereas total Population increased from 3199203 in 2001 to 3673917 in 2011 (increased by 14.8%). Sex Ratio is 960 (in 2001 it was 948); in all India scenario it is 943. Population in the group 0-6 increased from 436446 in 2001 to 458014 in 2011 (increased by 5%). Schedule Caste Population is 17.8% of the total population. Sex ratio was 962 in 2001 which had decreased to 959 in 2011. Schedule Tribe Population is 31.8% of total Population. Sex ratio was 970 in 2001; now in 2011 it is 983 (for rural 982 and urban 1017). Literacy rate, as per the 2011 Census was 87.22% (against 73.19% in 2001). By 08.09.2014, literacy rate of the state reached up to 96.82%. Male-Female Literacy gap reduced to 7% which was the highest reduction in the country during the 2001- 2011 decade, thus fetching the State, Decadal Literacy Award. Since the distant past, agriculture in various forms has been the mainstay in the lives of people in Tripura. The primary sector (Agricultural) contributes about 64% of total employment in the state and about 48% of the State Domestic Product (SDP). A variety of Horticultural/Plantation Crops are produced in Tripura like Pineapple, Orange, Cashew nut, Jackfruit, Coconut, Tea, Rubber, Forest Plantations etc. At present both conventional settled agriculture in the plains and Jhum system of cultivation in the hills are practiced, although earlier many tribal people depended more on Jhum system of cultivation, perhaps due to their life- pattern i.e. predominantly living in the hill areas. State has 60 per cent of the geographical area covered by forests.

Districts of Tripura

Sl. No.	District	Sub- Div.	Blocks	Panchayat	Revenue Circles	Revenue Mouja	TTAADC	MC/NP
1.	West	3	9	87	5	112	85	4
2.	Sepahijala	3	7	111	6	118	58	3
3.	Khowai	2	6	54	4	79	69	2

Sl. No.	District	Sub- Div.	Blocks	Panchayat	Revenue Circles	Revenue Mouja	TTAADC	MC/NP
4.	Gomati	3	8	70	7	130	103	2
5.	South	3	8	99	6	138	70	3
6.	Dhalai	4	8	41	7	154	110	2
7.	Unokoti	2	4	59	3	78	32	2
8.	North	3	8	70	7	88	60	2
9.	Tripura	23	58	591	45	897	587	20

Climate Profile

Climate Change is generally defined as "a change in the state of the climate that can be identified (e.g., using statistical analysis) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer" (IPCC 2014). Anthropogenic climate change is defined as a change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere (e.g., increase in greenhouse gases due to fossil fuel emissions) or surface characteristics e.g., deforestation) and which is in addition to natural climate variability observed over comparable time periods. It is reported that, in India, the mean annual temperature increased by 0.6°C over the last century; the monsoon rainfall has declined over the last three decades of the 20th century in many parts of the country, while some parts have showed an increasing trend in the observed frequency of heavy precipitation events.[1]

Past and on-Going Climate Trend

Tripura is in the north eastern region of India and lies between 22°56 & 24°32" north latitudes and 91°10 & 92°20 east longitudes. The State is part of the Himalayan Ecosystem and five major hill ranges- Hathaik'tor, Hachuk Beram, Longtharai, Shakhan and Jampui run through the state from north to south. It has a humid tropical climate. It observes moderately warm temperatures during summer and moderately cold temperatures during winter. Spring season starts from late mid February and continues till mid-March. The State experiences high humidity in summer season because of the presence of Bay of Bengal to its south. It sometimes experiences early winter if there is early rain around mid- February. Summer season starts from middle of March and lasts up to May. Monsoon season through is from June-September, rainfall is seen across the seasons. Annual rainfall ranges from 1922 mm to 2855 mm. The State experiences four seasons:

1. Winter-Winter starts from December itself. During winter, the state experiences moderate to dense fog and sometimes very dense fog. January remains the coldest month and average temperature remains around 10°C.
2. Pre-Monsoon (summer)-Temperature starts increasing from March which results in thunderstorms. These thunderstorms in this season are called "Kalbaisakht' in local language. The average maximum temperature remains around 31 to 32°C and minimum temperature around 24 to 25°C. April remains the warmest month of the year.

1 *IPCC (2014) 'Summary for Policymakers', in Edenhofer, O., Pichs-Madruga, R., Sokona, Y., Farahani, E., Kadner, 8., Seyboth, K., Adler, A., Baum, I., Brunner, 5., Eickemeier, P.,Kriemann, B., Savolainen, J., Schlémer, 5., von Stechow, C., Zwickel, T. and Minx, J.C.(Eds.): Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK and New York, NY, USA*

3. Monsoon-South-west monsoon enters the State during first week of June. The State receives 60% of the annual rainfall during this period with average rainfall of more than 1300 mm. June remains the rainiest season with more than 400 mm of average rainfall.

4. Post-Monsoon-Rainfall and temperature starts decreasing in the State from October. The average maximum temperature remains around 26°C and the average minimum temperature remains around 11°C. The weather becomes dry from November, morning starts becoming foggy from December and winter season commences.

Temperature

Based on the historical IMD Gridded data on daily temperature (maximum and minimum) from 1951 to 2013 for the state of Tripura has been analysed. This has been given in the table below:

District	T-max	T-min
Dhalai	28.0	17.8
North Tripura	27.9	17.8
South Tripura	28.2	17.9
West Tripura	28.2	17.9
Khowai	28.0	17.8
Unakoti	27.9	17.8
Gomati	28.2	17.9
Sepahijala	28.2	17.9

Mean annual maximum temperature for Tripura is 28.1°C with a range varying from 27.9°C to 28.2°C. It is also observed that for annual maximum temperature, the highest value is attained for the districts - South Tripura, West Tripura, Gomati and Sepahijala. Mean annual minimum temperature is 17.9 degree Centigrade with a range varying from 17.8°C to 17.9°C.

The lowest average minimum temperature was 17.8°C in Dhalai, North Tripura, Khowai and Unakoti. The past trend shows that both average annual maximum temperature and minimum temperature are showing an increasing trend.

The analysis[2] of the projected daily temperature under climate change scenario shows that: e Mean annual maximum temperature for RCP 4.5 scenario is projected to increase by about 1.1°C by mid-century. For RCP 8.5 scenario it is projected to increase by about 1.35°C by mid-century for the state of Tripura. e Mean annual minimum temperature for RCP 4.5 scenario is projected to increase by about 1.05°C by mid-century. For RCP 8.5 scenario it is projected to increase by about 1.35°C by mid-century.

Precipitation

Based on the IMD gridded data, the precipitation trends (1951-2013) have been given below. Average annual rainfall of Tripura varies with a range from 2338 mm to 2519 mm over the period 1951-2013.

2 *Analysis from IMD gridded data and climate projection data source INRM.*

District	Average Annual Precipitation in mm
Dhalai	2472
North Tripura	2519
South Tripura	2415
West Tripura	2338
Khowai	2472
Unakoti	2519
Gomati	2415
Sepahijala	2338

From the above table, it is clear that North Tripura and Unakoti districts receive higher annual average rainfall than rest of the districts. The historical trend shows Dhalai, Khowai, North Tripura, Unakoti, South Tripura and Gomati, the precipitation is in a decreasing trend whereas West Tripura and Sepahijala is showing an increasing trend.

General implications of temperature increase may include heat stress related health impacts, increase in energy demand for cooling, evaporation and evapotranspiration losses resulting in increase in water required for irrigation of crops. Considering increase in intensity of rainfall events may lead to floods, urban storms, Vector-borne diseases, loss of work, transport disruption, additional cost for flood proofing factories and warehouses. Maximum precipitation event may decrease towards mid-century. The cold spell events may decrease about 2/3" towards mid-century.

Climate Vulnerability

Although the state is small with a population of only over three million, Tripura is the 2nd most populous state in the North Eastern Region. The social composition of the population of Tripura is diverse. Around one-third of the population belongs to the Scheduled Tribes. According to 2011 census, the state's population is 36.74 lakh, with a density of 350 persons per sq. km. Population pattern and demography have always been fluctuating. In 1901 Tripura's population was 1.73 lakh, with tribals making up nearly 52.89% of the whole. By 1941, the total population rose to 5.13 lakh with a barely 50.09% tribal majority. But by 1981, the tribal population dipped to 28.44% of a total population of 2.05 million because of several socio-political developments.

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Plantation Crops are produced in Tripura like Pineapple, Orange, Cashew nut, Jackfruit, Coconut, Tea, Rubber, Forest Plantations etc. At present both conventional settled agriculture in the plains and Jhum system of cultivation in the hills are practiced, although earlier many tribal people depended more on Jhum system of cultivation, perhaps due to their life-pattern i.e. predominantly living in the hill areas. In a state where 60 per cent of the geographical area is under forest land.

The climate of Tripura exhibits a strong seasonal rhythm. The state is characterized by a **warm and humid tropical climate** with five distinct seasons, namely, spring, summer, monsoon, autumn and winter. Spring starts from late mid-February & continues till mid March.

It was witnessed that in recent years, Tripura faced many climate change impact in terms increased in vector density (raise of dengue and malaria), extreme weather like high temperature, droughts, floods, landslide, and reduction in winter duration including air borne diseases like COVID-19.

Due to improper distribution of public distribution system (PDS) and its short falls, many people of hilly areas specially from Dhalai, North, and Unakoti districts of Tripura are totally depending on jhum cultivation leading to deforestation or destruction of natural forest area. Urbanization is also taking place at a faster rate. In recent years, usage of private vehicles also increased by 10 fold which may lead to many air pollution related diseases. In recent years, Tripura has also witnessed record high temperatures in 2019 (37.2°C) and highest rainfall in 2018 (242.6 km) in a single day.

Due to rapid urbanization, diversity in geographical distribution, risk behaviours, deforestation, disaster prone geolocation, uncertainty of natural calamities like rainfall, floods, collapse, lack of adaptation, mitigation policy in Tripura, climate vulnerability is comparatively high for the state.

Disease Vulnerability Assessment

Health and vulnerability assessment was published in 2017. This report focuses on the health impact of climate change that is relevant for Tripura, assessing the vulnerability of health issues to this impact, and providing insights into building health sector-specific adaptive capacity. The impact of climate change on health is detailed and analyzed at various levels, in relation to an increased frequency and/or intensity of extreme weather events, as well as those due to a progressive increase in temperatures. This report has primarily used indicative evidence rather than assertive evidence, due to the nature of the available data. The methodology aims at validating an association between climate change and health outcomes by means of analyzing:

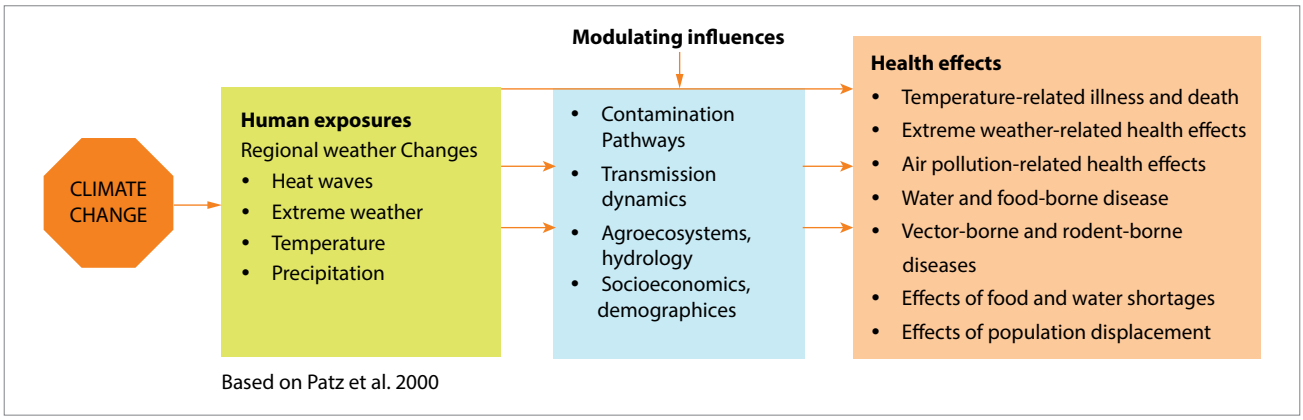
1. Seasonality and vulnerability in pattern of diseases.
2. Changing vulnerability to specific diseases across regions.
3. Correlation of health data with climate indices.

It also assesses the various health programs and their potential to serve as adaptation measures. Temporal and spatial analysis of health and weather parameters is urgent now. Cases of fever and infection-related hospitalization are likely to be higher in regions with greater rainfall and greater difference between daily maximum and minimum temperatures. However, research activity should be carried out to see the causal relationship between diseases occurrences and climate changes or variations.

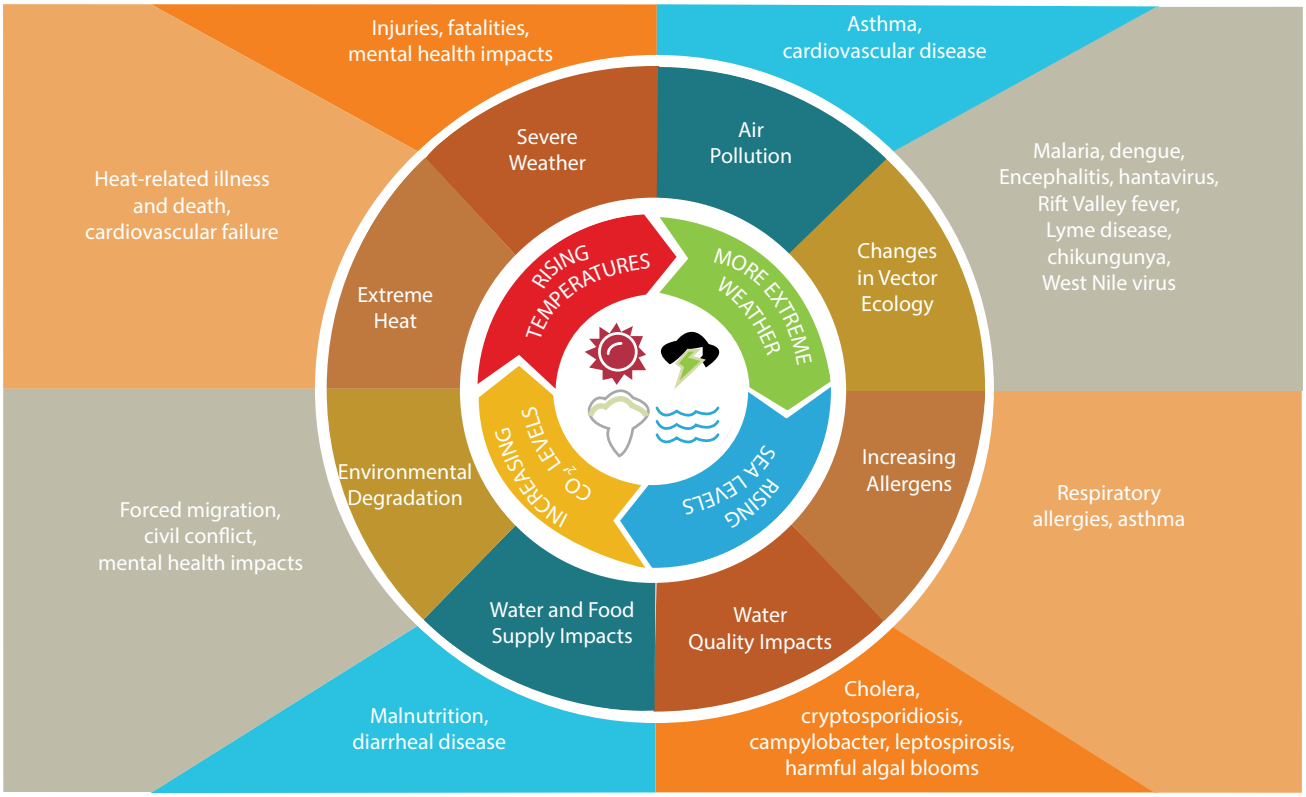
Vulnerable areas/population:

- Areas with weak health infrastructure
- Hilly areas

- Forest dwellers or jhum cultivators
- Crowded urban area
- Slums dwellings
- Population – elderly, children, pregnant mother, bed ridden patient and marginalized section
- Area near sea/river/roads/construction area



Based on Patz et al. 2000




#ClimateChange
WHO IS AT RISK OF CLIMATE CHANGE?
Those living in poverty, as well as women, children and the elderly.
Outdoor workers and people living with chronic medical conditions.
Children are the most vulnerable due to long exposure to environmental risks.
EVERYONE
EVERYONE
Those living in megacities, small island developing states and other coastal, mountainous and polar regions.
Countries with weak health systems will be least able to prepare and respond.
World Health Organization

CHAPTER 3

Climate Sensitive Issues or Diseases in Tripura

Accrued empirical evidence has already established climate disease relationship. Public health which is highly dependent upon the availability of adequate quantity and quality of food, safe drinking water, decent home protected against disasters, a reasonable income and good social and community relations (WHO, 2003) is projected to be affected by climate change (Rahman A, 2008). Such adverse impact includes morbidity and mortality due to increased heat, air pollution effects, malnutrition, water borne diseases like diarrhea, cholera, typhoid and gastroenteritis, and Vector-borne diseases such as malaria. Tripura already has a combination of many of this human health related issues. Such issues are likely to be exacerbate due to climate change.

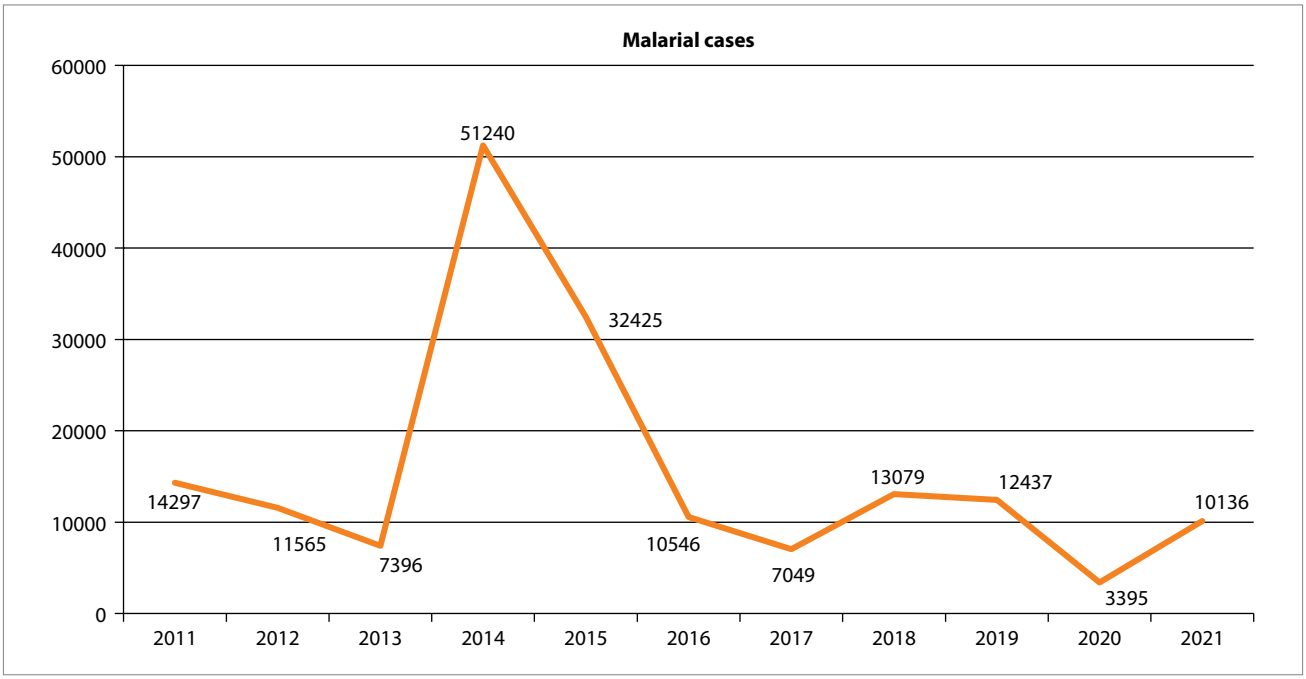
Tripura does not have to deal with the negative effects of climate change on account of extreme heat, but the state deals with numerous issues as a result of the cold wave during the winters, particularly in the North District. But as the temperature has risen in recent years, human health has been negatively impacted, combined with other environmental concerns. The effects of climate change have led to a sharp rise in the number of climate- sensitive diseases that are common in the State. As a result of rising temperatures, the population is now more susceptible to a wide range of diseases and health problems. Among Tripura's four districts (East, West, North, and South), some areas of the East district have been put on the priority list because of an increase in cases of illnesses that are exacerbated by the climate.

Climate Sensitive Illnesses or Issues in Tripura

A. Vector-borne Diseases

Health related vulnerability affects the household expenditure due to loss in livelihood. While several diseases are endemic to this region because of its geographical location, the discourse here is on Vector-borne diseases that are climate linked. Epidemiological study has established the linkage between climate change and malaria as the development of the parasite takes place in a mosquito which being a cold-blooded creature is sensitive to climatic conditions such as temperature, rainfall, relative humidity and wind velocity. At increased temperatures the rate of digestion of blood meal in mosquito increases which in turn accelerates the ovarian development, egg laying, reduction in duration of gonotrophic cycle and higher frequency of feeding on hosts thereby enhancing the probability of transmission as reduction in the duration of gonotrophic cycle and sporogony are related with increased rate of transmission. Vector-borne Diseases (VBDs) are climate-sensitive as the pathogen has to complete some part of its development in insect/arthropod vectors like mosquitoes, sandflies, ticks, etc. and are affected by climatic conditions like temperature, rainfall, relative humidity, wind velocity etc. It is well known that seasonal fluctuations in VBDs are caused by fluctuating climatic conditions (Dhiman et al).

		2021		2020		2019	
Sl. No.	Climate Sensitive Illness	Cases	Deaths	Cases	Deaths	Cases	Deaths
1	Malaria	10136	4	3395	2	12437	1



Example: Malaria situation last 10 years (TRIPURA)

Dengue, Scrub Typhus and Chikungunya are other Vector-borne diseases prevalent in Tripura.

Sl. No.	Year	Disease	Tested	Positive	Percentage	Death
1	2020	Malaria	3,94,503	3,395	0.86	02
		Dengue	482	24	4.98	0
		Chikungunya	454	24	5.29	0
		JE	244	19	7.79	0
2	2021	Malaria	4,84,883	10,136	2.09	04
		Dengue	2,010	349	17.36	0
		Chikungunya	948	20	2.11	0
		JE	162	25	15.43	0
3	2022	Malaria	8,71,279	12,771	1.47	03
		Dengue	1,223	56	4.58	0
		Chikungunya	885	17	1.92	0
		JE	191	14	7.33	0

B. Water Borne Diseases

Water borne diseases is subjected to be proliferated under the indirect impact of climate change. Such incidence can be classified as water borne (ingested) and water washed (caused by lack of hygiene). Tripura being situated in flood prone area, most of the times is vulnerable in the aftermath of floods due to unavailability of safe water supply, hygienic food availability, improper sanitation and improper bio-waste disposal leading to negative health outcomes. Direct impacts can be categorized under incidence like diarrhea, vector-and rodent-borne diseases like malaria, leptospirosis; skin and eye infections; and psychological stress. The indirect health consequences are usually related to damage to water and sanitation infrastructure, damage to crops and disruption of food supplies, destruction of property causing lack of shelter which might lead to increased exposure to disease-vectors. Climate change in the state is likely to worsen the water quality in several parts of Tripura. This will make the women and children more vulnerable. Typhoid fever/Enteric fever and Acute Diarrheal Diseases are common water borne diseases. Key priorities should be: Water usage management through improved urban drainage, sanitation management and drinking water quality to reduce Climate change impacts.

C. Acute Respiratory Illness

Assuming current emission level continues, there is high chances of deterioration of air quality in urban areas as well as increased exposure to ozone and other air pollutants including particulate matter resulting in an increase in acute respiratory illness and cardio-respiratory morbidity and mortality. Certain weather patterns enhance the development of urban heat island, the intensity of which is important for secondary chemical reaction within the urban atmosphere leading to elevated level of some pollutants. The climate change may also alter the seasonal distribution of some allergenic pollen species leading to physiological problem.

In some areas there are reduction in yields of biomass adding to the labour of the women to fetch them for cooking. There are also increased risks to human health with children, women (especially the pregnant) and the elderly in a household becoming the most vulnerable due to lower nutritional status and enhanced air and water pollution. The other important issue is that the women help in increasing the social capital and make the community resilient. It has been seen through the work of SHG groups and especially during the post disaster recovery period. Therefore, it is important to nurture such social capital through the strengthening women's institutions like SHG groups to enhance their resilience.

D. Health impacts due to disasters

Flood, Drought and other climate linked events Critical analysis of the available material shows that in Tripura, the flood magnitude is likely to increase by about 25% in the future as compared to the present. The number of drought weeks during monsoon months shows an increasing trend to the tune of about 25 % increase in future (Ravindranath et al., 2011). This affects the vulnerability of the state in the agricultural sector and adversely affects cultivators, agricultural labourers as well as retail trade which is either based on agricultural produce or non-timber forest products.

The city of Agartala is highly vulnerable to climate related issues mainly due to its close proximity with the international border. The development plan of Agartala City and other towns particularly in regard to management of heavy precipitation situation has a close link with trans-border planning process. A number of studies have shown that low lying areas of Agartala and other cities/towns bordering with Bangladesh

are vulnerable to a range of risks related to climate change including flooding. The main causes of flooding in Agartala city and other Towns are intense precipitation and backflow of water from Bangladesh. Many portions of Tripura which is surrounded by Bangladesh in 85% of its border have Saucer topography and consequent problems with drainage.

Districts namely West Tripura, Bishlagarh, Sonapmura, Khowai, Teliamura sub-divisions; in South Tripura, Udaipur, Sabroom, Amarpur, Belonia, Santra Bazar; in North Tripura, Dhramanagar, Kailasahar and in Dhalai Kamlapur, Manu and Chwamnu areas are flood prone areas in Tripura.

E. Earthquake

Tripura state falls under the seismic zone V which is most vulnerable to earthquake disasters. Climate change and urban disaster risk are the two biggest challenges for Tripura as it faces the consequences of unprecedented rates of population growth, urbanization, economic development and GHG emissions. Most of the towns and the capital city lies in a mountainous high terrain region which are prone to natural hazards, so all the towns will be considered for appropriate measures to reduce its vulnerability.

CHAPTER 4
Vision, Goal and Objectives

National Programme on Climate Change and Human Health (NPCCHH) is a flagship programme of Ministry of Health and Family Welfare shaping health system response to climate change in the country. The programme was approved in February 2019 for funding of the implementation of the programme related activities in the States under National Health Mission (NHM).

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 weather.

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

Specific Objectives

Objective 1: To create awareness among the general population (vulnerable community), healthcare 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 national/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 country in coordination with the Ministry of Health & Family Welfare.

Objective 5: To strengthen state research capacity to fill the evidence gap on climate change impact on human health.

CHAPTER 5
Organisational Structure

ORGANISATIONAL STRUCTURE

NATIONAL LEVEL

Key Nodal Agency
Head, NPCCHH
(NCDC, MoHFW)

- Prime Minister's Council on Climate Change
- Health Mission
- Ministry of Health and Family Welfare (MoHFW), Govt of India

STATE LEVEL

Key Nodal Point
(SNO-NPCCHH)

- State Governing Body - Environmental Health
- State Level Task Force - Environmental Health
- State Environmental Health Cell

DISTRICT LEVEL

Key Nodal Point
(DNO-NPCCHH)

- District Task Force - Environmental Health
- District Environmental Health Cell

Tripura State Governing Body for Environmental Health

The State level governing body for policy level decision shall be working under Chairpersonship of Hon'ble State Health Minister. The members of the Governing Body are as follows:

Hon'ble State Health Minister	Chairperson
Secretary(Health & Family Welfare)	Vice Chairperson
Director of Family Welfare & P.M	Member Secretary
Ex-Officio Addl. Secretary & DHS	Member
Mission Director, NHM	Member
Chief Engineer, DWS	Member
Director, DSTE	Member

Tripura State Task Force Committee for NPCCHH

This task force shall be working under the guidance of Secretary (Health) of the State. It shall be directly overseeing the implementation of the State Action Plan for Climate Change and Human Health (SAPCCHH) in the State. The members of the State Level Task Force are as follows:

Secretary (Health & Family Welfare)	Chairperson
Mission Director, NHM	Co-Chairperson
State Nodal Officer, NPCCHH	Member Secretary
Director of Health Services	Member
Director of Family Welfare & PM	Member
Chairperson, State Pollution Control Board	Member
Chairperson, State Disaster Management Authority	Member
Chief Engineer, DWS	Member
State Nodal Officer, Bio Waste Management	Member
Director, Directorate of Agriculture	Member
Director, Meteorological Department	Convener

Roles and Responsibility of a Few Key Members of Task Force

	Roles and Responsibilities
SNO-CC	• Overall responsibility to co-ordinate activities of assessing impact of Air Pollution on health and to suggest measures to reduce the same. • Co-ordinate with Directorate of Medical Education to identify the sentinel sites for ARI Surveillance. • Conduct training to the DNO's and TOT's on air pollution related issues. • Conduct sensitization workshops at state level. • Coordinate with the districts for air pollution related activities. • Dissemination of IEC materials • Conduct the taskforce meeting on air pollution related health issues.

	Roles and Responsibilities
DNO-CC	• Conduct awareness and sensitization workshops to the MO's. • Dissemination of IEC materials to all the health care facilities. • Conduct the taskforce meeting on air pollution related health issues. • Identify the hospitals for sentinel surveillance on air pollution. • Coordinate with the identified sentinel hospitals for data collection, compilation and analysis. • Conduct training to the MO's on air pollution related health issues including surveillance.
Medical Officer- Block Level	• Conduct training to the Panchayati Raj Institutions, Health care workers on air pollution related health issues. • Coordination with other departments like PWD, PRI, ICDS etc. • Conduct and supervise awareness generation and dissemination of IEC materials among the healthcare workers, PRI's etc.
Medical Officer- PHC Level	• Conduct training to the Panchayati Raj Institutions, Health care workers on air pollution related health issues. • Coordination with other departments like PWD, PRI, ICDS etc. • Conduct and supervise awareness generation and dissemination of IEC materials among the healthcare workers, PRI's etc.
Roles and Responsibilities of Other Departments	
Director, from any research Institute	• To create evidence of Air Pollution impact on health by undertaking various studies, research for the same.
Director, Meteorological department of State/ UT	• To provide timely data of temperature, rainfall, wind speed or any other relevant meteorological factors having relation with increase or decrease of air pollution for particular city/district. • To give inputs for reducing air pollution in relation to meteorological factors.
Chairperson, State Pollution Control Board	• To provide Air Quality Data for the cities identified under the Sentinel Surveillance for assessing impact of Air Pollution. • To undertake measures to reduce the Air pollution and improve quality of air. • To monitor the progress of activities undertaken for reduction of Air Pollution.
Chairperson, State Disaster Management Authority	• To monitor the situation of the Air, Water, Soil Pollution in different cities of state. • To monitor the impact of industries on disasters.
State Surveillance Officers	• To take necessary actions in regular data collection and analysis of data. • To prepare and disseminate IEC on regular basis to the cities where air pollution is the big issue for public health.
Environmental Engineer/Senior Scientist from MOEFCC	• To enlist & share probable causes of increase in air pollution within cities of the state. • To give necessary inputs to reduce air pollution as per the causes identified.
Secretary, State Agriculture Ministry	• Prevent on-farm burning of crop residue.
WHO, UNICEF	• Support in capacity building, logistics, funding, research development, • Management SOPs
NGOs, Civil societies (PPP)	• Support in manpower, monitoring

Formation of different team/committees:

1. Emergency Response team (PHC, CHC, Block, District, State)
2. Monitoring & Evaluation Team (District & State)
3. District Task force/Interdepartmental coordination committee

PART II

Health Action Plans on Priority Climate Sensitive Health Issues

CHAPTER 6

Health Action Plan on Air Pollution Related Diseases

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

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

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

Air Quality Index (AQI) Category	
Good	0-50
Satisfactory	51-100
Moderately Poor	101-200
Poor	201-300
Very Poor	301- 400
Severe	401-500

As pe the National Clean Air Programme (NACP) report there are 2 air quality monitoring stations in the state at Agartala. The recorded average AQI levels by the monitoring stations in Agartala are as follows:

City or Locality	Measurement Year	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	NO_2 (µg/m³)	PM_{25} temporal coverage (%)	PM_{10} temporal coverage (%)
Agartala	2017	39.5	61.5	17	66.35	66.35
Agartala	2018	42	75.5	17.5	100	100
Agartala	2019	42.5	76.5	10.5	79.80	79.80

Health Adaptation Plan Heat

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

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

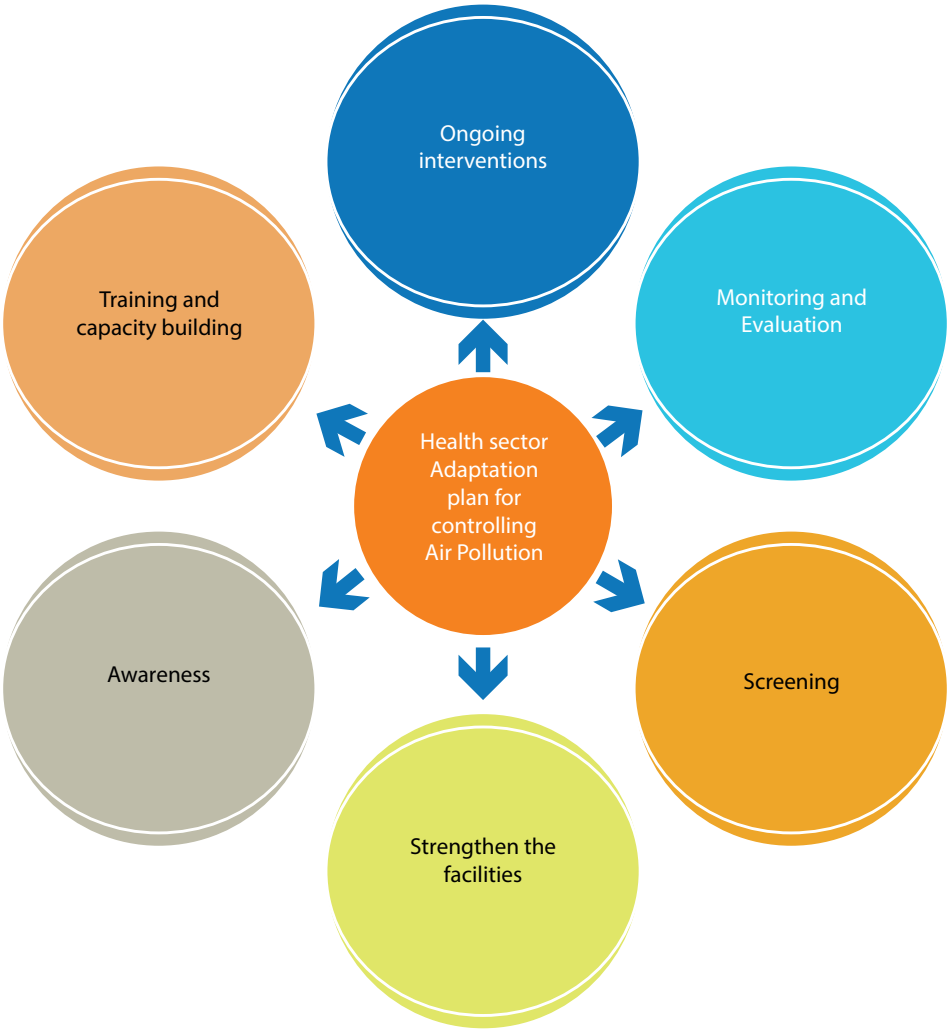
Goal: To reduce morbidity, mortality, health vulnerability due to air pollution.

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

Specific Objectives:

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

Health Sector Adaptation plan for Air Pollution Control



Key components of Health adaptation plan of ARI:

a. IEC and awareness generation

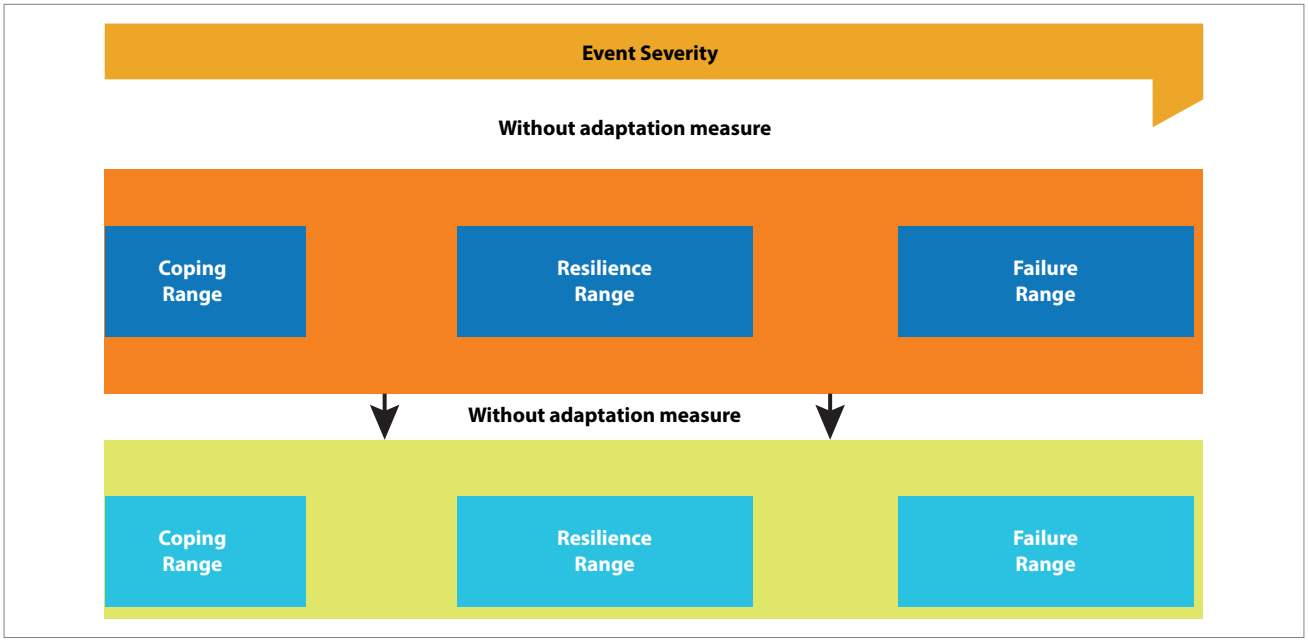
b. Capacity building

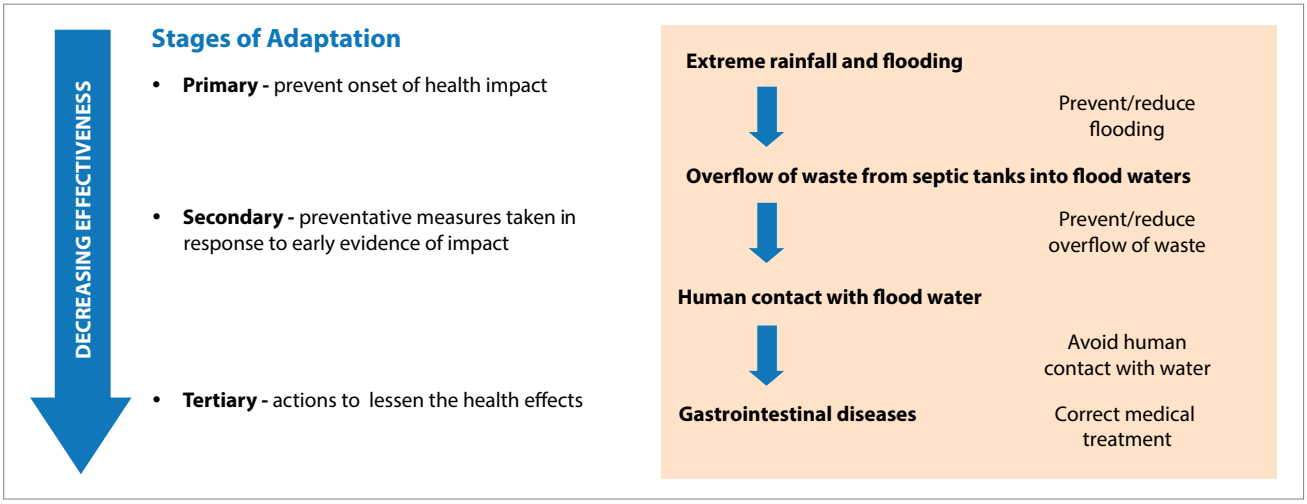
c. Surveillance

Adaptation

Coping with climate change – taking measures to reduce the negative effects, or exploit the positive ones, by making appropriate adjustments. It depends on coping range, resilience range, and failure range.

Severity of an event with and without Adaptation





1. Awareness Generation

IEC Campaign

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

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

Considerations for IEC tool development on air pollution and health

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

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

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

IEC Dissemination Plan

<table>
<tr><th rowspan="2">Sl. No.</th><th rowspan="2">IEC Content</th><th rowspan="2">Activity</th><th rowspan="2">Dissemination plan for 5 years</th><th rowspan="2">Timeline</th><th colspan="5">Budget (in lakhs) for 5 years</th></tr>
<tr><th>2022-23</th><th>2023-24</th><th>2024-25</th><th>2025-26</th><th>2026-27</th></tr>
<tr><td>1</td><td rowspan="5">Pamphlet, poster, banner, Newspaper ad, Folk activities, School quiz/essay competition, Voice message/OBD calls etc.</td><td rowspan="2">a. Development of IEC tools and printing
b. Hiring of agency for folk activities</td><td>2 Posters for Healthcare facilities in all districts</td><td rowspan="2">August-September</td><td rowspan="5">12.0</td><td rowspan="5">12.0</td><td rowspan="5">14.0</td><td rowspan="5">16.0</td><td rowspan="5">18.0</td></tr>
<tr><td>2</td><td rowspan="2">Social Media (Facebook, Instagram, Twitter etc.)</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td><td rowspan="2">a. Dissemination of IEC materials
b. Folk activities (Nukkad Nataks)</td><td rowspan="2">October-February</td></tr>
<tr><td>5</td><td>1 in all the Healthcare facilities</td></tr>
</table>

*No separate IEC budget for Air pollution

Observation of special days

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

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

2. Capacity Building

Capacity building efforts include developing the technical skills and institutional capability in developing countries and economies in transition to enable them to participate in all aspects of adaptation to, mitigation

of, and research on climate change. Trainings, workshops, and meetings are very important to sensitise and update target groups on air pollution and its health impacts and various health adaptation mechanisms.

Some of the priority groups/human resource working in health sector and other departments are targeted to be trained on the health problems of air pollution, such as:

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

Air Pollution Training Modules are available on NCDC, GoI website

Module	Web link
Training Module for Health Professionals	https://ncdc.gov.in/WriteReadData/linkimages/HandbookforHealthProfessionalsonAirPollutions&ItsImpactonHealth.pdf
Women Training Manual (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/WomenTrainingManualHindi.pdf
Women Training Manual (English)	https://ncdc.gov.in/WriteReadData/linkimages/WomenTrainingManualEnglish.pdf
Women Flipchart (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/WomenFli pchartHindi.pdf
Women Flipchart (English)	https://ncdc.gov.in/WriteReadData/linkimages/WomenFli pchartEnglish.pdf
Children Training Manual (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenTrainingManualHindi.pdf
Children Training Manual (English)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenT rainingManualEnglish.pdf
Children Flipchart (Hindi)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenF lipchartHindi.pdf
Children Flipchart (English)	https://ncdc.gov.in/WriteReadData/linkimages/ChildrenF lipchartEnglish.pdf
Traffic Police Training Manual Hindi	https://ncdc.gov.in/WriteReadData/linkimages/IEC/Traffic PoliceTrainingManualHindi.pdf
Traffic Police Training Manual English	https://ncdc.gov.in/WriteReadData/linkimages/IEC/Traffic PoliceTrainingManualEnglish.pdf
Municipal Worker Training Manual Hindi	https://ncdc.gov.in/WriteReadData/linkimages/IEC/Municipal WorkerTrainingManualHindi.pdf
Municipal Worker Training Manual English	https://ncdc.gov.in/WriteReadData/linkimages/IEC/Municipal WorkerTrainingManualEnglish.pdf

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

Sensitization Workshop

Sl. No.	Sensitization Workshop	No. of Workshop Trainings	Timeline	Budget (in lakhs) for 5 years				
				2022 -23	2023 -24	2024–25	2025-26	2026- 27
1.	District Nodal Officers - CC	1 (State level)	September	3.00	3.00	Budget will be calculated as per requirement (with 15% increase at least)		
2.	Nodal Officer - ARI Surveillance							

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

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

Roles and Responsibilities

State Climate Change & Human Health Cell

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

District Climate Change & Human Health Cell

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

Block level CHC/PHC

1. Implementation of the identified activities on air pollution and health as per DAPCCHH
2. Capacity Building of Medical officers, Nursing officers, Pharmacists, Communities health officers, health care workers and other departments like PRI, WCD, etc.

3. Integrate and coordinate to get support from other National/State level programmes.
4. IEC Dissemination for increasing awareness generation to public and officials
5. Health advisories dissemination and implementation
6. Hospital preparedness for public health emergencies related to air pollution
7. Supervision and monitoring of Surveillance activities if any sentinel hospitals are involved in the block area

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

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

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

Community Health workers at the Village Level/Ward Level

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

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

CHAPTER 7

Health Action Plan on Heat Related Illnesses

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

a. Based on Departure from Normal

- *Heat Wave:* Departure from normal is 4.5°C to 6.4°C
- *Severe Heat Wave:* Departure from normal is >6.4°C

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

- *Heat Wave:* When actual maximum temperature ≥ 45°C
- *Severe Heat Wave:* When actual maximum temperature ≥47°C

Most of the inhabited regions of Tripura experience a temperate climate, with temperatures seldom exceeding 28°C (82°F) in summer. The average annual temperature for most of Tripura is around 18°C (64°F).

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

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

Different 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

Types of Heat Related Illnesses

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal/Important Signs	Pertinent Negative findings
Heat rash/ prickly heat/ Miliaria	All, but frequently children	Hot environment; +/- insulating clothing or swaddling (wrap in tight clothes)	**ITCHY RASH with SMALL RED BUMPS** at pores in the skin. Seen in setting of heat exposure; bumps can sometimes be filled with clear or white fluid	**DIFFUSED RED COLOUR SKIN OR VESICULAR RASH**, itching of the skin without visible eruption	**NOT FOCALLY DISTRIBUTED** like a contact dermatitis

Clinical Entity	Age Range	Setting	Cardinal Symptoms	Cardinal/Important Signs	Pertinent Negative findings
Heat cramps	All	Hot environment, **TYPICALLY WITH EXERTION,** +/- insulating clothing	**PAINFUL SPASMS** of large and frequently used muscle groups	Uncomfortable appearance, may have **DIFFICULTY FULLY EXTENDING AFFECTED LIMBS/ JOINTS**	No contaminated wounds/tetanus exposure; no seizure activity
Heat exhaustion	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling overheated, light headedness, **EXHAUSTED AND WEAK**, unsteady, feeling of **VOMITING, SWEATY AND THIRSTY**, inability to continue activities	**SWEATY**/ diaphoretic; flushed skin; hot skin; **NORMAL CORE TEMPERATURE**; +/- dazed, +/- generalized weakness, slight disorientation	No coincidental signs and symptoms of infection; no focal weakness; no difficulty in swallowing food or speech; no overdose history
Heat syncope	Typically adults	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Feeling hot and weak; light headed ness followed by a **BRIEF LOSS OF CONSCIOUSNESS**	Brief, generalized loss of consciousness in hot setting, short period of disorientation, if any	**NO SEIZURE ACTIVITY**, no loss of bowel or bladder continence, no focal weakness, no difficulties in food swallowing or speech
Heat Stroke	All	Hot environment; +/- exertion; +/- insulating clothing or swaddling (wrap in a tight clothes)	Severe overheating; profound weakness; **DISORIENTATION, NOT FULLY ALERT, CONVULSION, OR OTHER ALTERED MENTAL STATUS**	Flushed, **DRY SKIN** (not always), **CORE TEMP** ≥40°C OR 104°F; altered mental status with disorientation, incoherent behaviour, **COMA, CONVULSION**; tachycardia; +/- hypotension	No coincidental signs and symptoms of infection; no focal weakness; no difficulties in swallowing food or speech, no overdose history

Geo-physical & Climate variables i.e., Area with highest maximum temperature (Tmax), average day temperature, (month wise) as per IMD in previous 5 years.

Health Adaptation Plan on Heat Related Illness

I. Awareness Generation

To increase general awareness among all the relevant stakeholders including people especially vulnerable communities, health-care providers and policy makers regarding impacts of heat and ways to address them.

a. IEC Campaign

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

The content for the IEC for the heat related issues will be provided by the State NPCCHH division. The state will translate the content into the local or regional language (Bengali) and the role of the districts is to utilize these materials and disseminate at all levels.

The available IEC content at programme division

1. Posters
2. Videos
3. GIF

IEC Dissemination Plan

Sl. No.	IEC Content	Activity	Dissemination Plan for 5 Years	Timeline	Budget (In Lakhs) for 5 Years				
					2022-23	2023-24	2024-25	2025-26	2026-27
1			Social Media (Facebook, Instagram, Twitter etc.)		12.0	12.0	14.0	16.0	18.0
2									
3		a. Dissemination of IEC materials b. Folk activities (Nukkad Nataks)		April to July					
4			1 in all the Healthcare facilities						

**No separate IEC budget for Heat related illness*

b. Public Health Advisories

Health advisories are issued to alert the population of potential harmful impacts of increasing heat. Advisories are issued at central level and forwarded to Districts through State/UTs for public dissemination.

District should ensure timely dissemination of health advisories in locally acceptable language.

II. Capacity Building

To strengthen capacity of healthcare system to adapt/address illnesses/diseases due to impacts of heat.

a. Training on various health impacts of heat is as follows

NPCCHH Training Plan at District Level

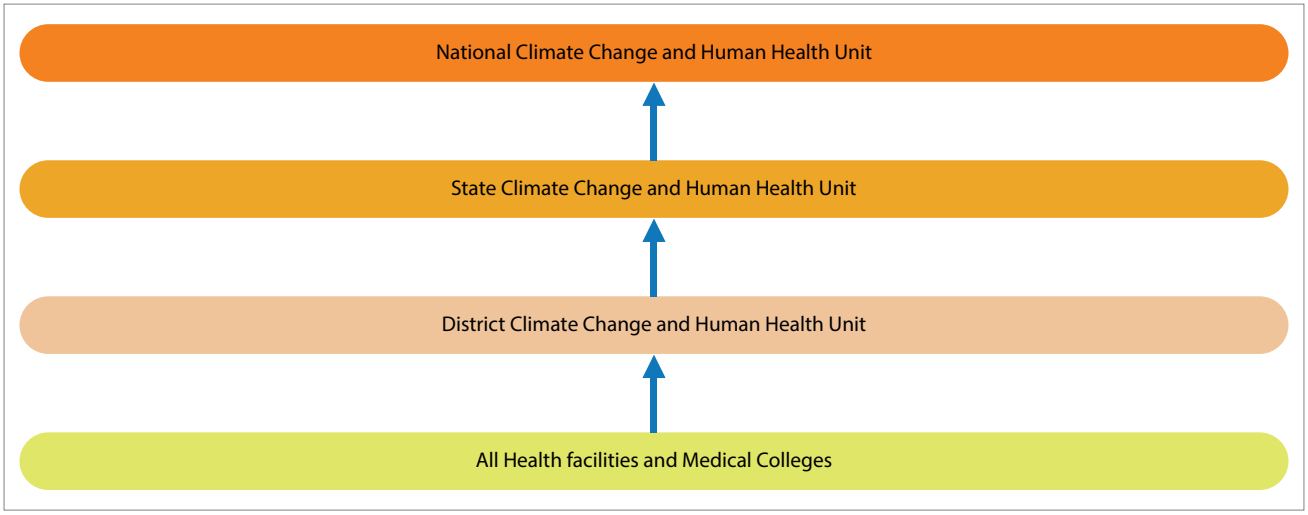
Training Programme	Trainer	Participants	Training Content
Medical Officers	DNO + Specialist/Trained Doctor (Trauma or Emergency Medicine)	MO (DH, CHC, PHC)	Heat related illness and its management
Community Health Care Workers (HWC)	MO	Community Health Workers (MPHW, ASHA)	
Panchayati Raj Institutions	MO, MLHP	Panchayati Raj Institutions, communities	

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

III. Surveillance

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

Reporting Flow and Mechanism



Roles and Responsibilities

State Climate Change & Human Health Cell

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

District Climate Change & Human Health Cell

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

Block level

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

Health Facility level

- HRI daily reporting
- IEC and awareness generation & dissemination
- Hospital level preparedness

Frontline Health Care Worker

- HRI surveillance
- Generate awareness among community
- Timely referral of suspected cases to nearest health facility

CHAPTER 8

Health Action Plan on Extreme Weather Event-Related Health Issues

The state has recorded raised morbidity and mortality due to effect of extreme weather conditions, frequent and severe episodes of heavy rainfall, increasing heat, floods, droughts and fires as a direct impact of climate variability and affecting population at large.

Climate change can result in more hot days & cold days resulting in more periods of 'drought', 'dust storms', or 'heavy rains (precipitation)', and even 'flooding' & 'landslides'. 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 illnesses and other infectious diseases (e.g. Vector-borne disease, cholera and also mental illnesses). The reason primarily is due to contamination of water and sewage disposal.

The State Disaster Management Authority (SDMA) in Tripura is a nodal institution for disaster prevention, mitigation, preparedness, and management of disaster impacts as a result of climate change. It is a part of the Department of Land Revenue. The State Disaster Management Authority (SDMA) and the Geological Survey of India (GSI) have come together to develop a regional level early warning system for excessive rainfall resulting in landslides. The warning system consists of over 200 sensors that can measure geophysical and hydrological parameters like rainfall, pore pressure and seismic activities. It will monitor a densely populated area which has seen landslides in the past. The system is capable of warning about 24 hours in advance.

As Tripura is a mountainous state, according to the State Disaster Management Plan under Multi Hazard Risk Vulnerability Assessment Study (MHRVA), the following hazards are considered to occur which is further identified and studied:

1. Earthquake hazards
2. Landslide hazards
3. Fire hazards
4. Flood/flash flood hazards
5. Snow avalanches hazards
6. Drought hazards
7. Hailstorm, thundering and lightening hazards

The most prevalent hazard due to the climate change causing damage to human health in the state is the landslide hazards caused due to heavy rainfall in the months of June – August which increases every year. The rainfall not only causes the damage to human health through landslides and floods but also the increase in mortality and morbidity rates due to the accidents majorly on road.

According to the Climate Research and Services, India Meteorological Department, Ministry of Earth Sciences, Pune, 'Observed Rainfall Variability and Changes Over Tripura State', during the last 30 years highest rainfall of June and July received in the year 2015 and 1990 (670.5 mm and 737.6 mm respectively) while highest rainfall of 637.0 in August received in the year 1990 and of 561.0 mm in September received in the year 2016. Highest annual rainfall of 3105.3 mm received in the year 2018 and highest southwest monsoon rainfall of 2156.7 mm received in the year 2009.

In the month of June the maximum number of rainy days lies in the range of 26–30 days especially in some parts of East Tripura while minimum number of rainy days lies in the range of 12–16 days especially in some parts of North Tripura and West Tripura districts.

In the month of July the maximum number of rainy days lies in the range of 31–36 days especially in some parts of East Tripura while minimum number of rainy days lies in the range of 17–21 days especially in some parts of North Tripura and West Tripura districts.

In the month of August the maximum number of rainy days lies in the range of 30–35 days especially in some parts of East Tripura. While the minimum number of rainy days lies in the range of 15–19 days especially in some parts of West Tripura and North Tripura districts.

Network for Testing/Diagnosis/Surveillance against health hazards due to climate hazards

1. Adequate infrastructure setting up in all public health institutions (PHC, CHC, SDH, DH and State Hospital): for climate change prone health events/diseases including mental health. Additionally testing for tropical diseases also to be covered.
2. Adequate manpower and logistics for testing facility.

Extensive Surveillance Unit

a. Existing IHIP/IDSP has to be strengthened
b. Timely data entry and reporting specifically for climate hazards
c. Assignment of new Nodal officer for surveillance additionally
d. Supporting staff for data management
e. Coordination from ground level to state authority level

Monitoring and Evaluation Network (MEN) & Research Development

a. Supportive supervision and monitoring team or unit formation at every possible level
b. Multi-departmental monitoring unit
c. Encouragement for research/projects on climate change at local or regional level
d. Involvement of Research unit (AGMC)

Data reporting, analysis, storage & review

a. Regular review at Block, District and state level
b. Analysis of climate change and weather forecast
c. Analysis of disease trends

Multi-sectoral collaboration action (Involvement of civil societies, NGOs, SHGs): public private partnership model

a. Involvement of civil society, NGOs and self help groups

b. Engagement of national and international organizations

c. Distribution of responsibilities among private sectors

Health Adaptation Plan for Disaster Management

I. Awareness Generation

Extensive Awareness Generation up to village level including behavioural change communication

To increase general awareness among all the relevant stakeholders including people especially vulnerable communities, health-care providers and policy makers regarding disaster management and ways to address them. Involvement of NGOs, village pradhans/PRI.

a. IEC Campaign (information motivation communication)

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

The content for the IEC for the disaster management will be provided by the State NPCCHH division. The state will translate the content into the local or regional language and the role of the districts is to utilize these materials and disseminate at all levels.

The available IEC content at programme division

1. Posters
2. Videos
3. GIF

Climate change & Media Coverage including IEC programs

a. Extensive media coverage through TV, Radio, Newspaper, Facebook, Twitters, Instagram etc.

b. PRI involvement in public gathering for awareness generation

c. Social behavioral change communication on prevention, adaptation, mitigation etc.

d. Flex poster, banner related to impact of climate change or health hazards.

e. Inter-departmental activities for awareness campaign.

b. Public Health Advisories

Health advisories are issued to alert population of disaster management. Advisories are issued at central level and forwarded to Districts through State/UTs for public dissemination.

District should ensure timely dissemination of health advisories in locally acceptable language.

II. Capacity Building

To strengthen capacity of healthcare system to disaster management

a. Training on disaster management is as follows

NPCCHH Training Plan at District Level

Training Programme	Trainer	Participants	Training Content
Medical Officers	DNO	MO (DH, CHC, PHC)	Climate change and its impact on health, Disaster Management
Community Health Care Workers (HWC)	MO	Community Health Workers (CHO, MPHW, ASHA)	
Panchayati Raj Institutions	MO, MLHP	Panchayati Raj Institutions, communities	
Education Department	MO	School teachers	

b. Sensitization/knowledge building workshops should be planned for seeking updates on disaster management between district officials, medical officers and academic institutions working on climate change impact.

Roles and Responsibilities

State Climate Change & Human Health Cell

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

District Climate Change & Human Health Cell

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

Block level

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

Health Facility level

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

Frontline Health Care Worker

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

CHAPTER 9

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

Introduction

Vector-borne diseases account for more than 17% of all infectious disease, causing more than 700,000 deaths annually. They can be caused due to parasites, bacteria or viruses. (Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many of these vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host, after the pathogen has replicated. Often, once a vector becomes infectious, they are capable of transmitting the pathogen for the rest of their life during each subsequent bite/blood meal.

Every year there are more than 700,000 deaths from diseases such as malaria, dengue, schistosomiasis, human African trypanosomiasis, leishmaniasis, Chagas disease, yellow fever, Japanese encephalitis and onchocerciasis. Since 2014, major outbreaks of dengue, malaria, chikungunya, yellow fever and Zika have afflicted populations, claimed lives, and overwhelmed health systems in many countries. Other diseases such as Chikungunya, leishmaniasis and lymphatic filariasis cause chronic suffering, life-long morbidity, disability and occasional stigmatisation.

Effect of variation in climate has been well established for illnesses which are spread through vectors or which are transmitted from animals to humans.

Vector-borne diseases are among the most well studied of the diseases associated with climate change, owing to their large disease burden, widespread occurrence and high sensitivity to climatic factors. In contrast to other climate-sensitive health risks, such as heat-stress, or exposure to storms and floods, the influence of meteorological factors is less direct, and more diverse, both within and between individual diseases. The simplest connections are through temperature, affecting the biting, survival and reproductive rates of the vectors, and the survival and development rates of the pathogens that they carry. Precipitation also exerts a very strong influence, most obviously in the case of diseases transmitted by vectors that have aquatic developmental stages (such as mosquitoes), but also, via humidity, on diseases transmitted by vectors without such stages, such as ticks or sand flies.

The causes of different Vector-borne diseases in the state

1. Temperature which affects the biting, survival and reproductive rates of the vectors, and the survival and development rates of the pathogens that they carry.

2. Climate-sensitive health risks, such as heat stress, or exposure to storms and floods, the influence of meteorological factors.

Adaptation strategy and action plan for Vector-borne diseases (NVBDCP)

1. Protective measures and greater community mobilization.
2. Increased technical capacity.
3. Increased Infrastructure.
4. Strengthened monitoring and Surveillance systems.
5. Case Management; Lab diagnosis and clinical management.
6. Vector management; environmental management for source reduction, chemical control, personal protection and legislation.

Adaptation Strategy

National Programme for Prevention & Management of Trauma & Burn Injuries (Nppmt & Bi): Develop and adhere to management protocol at all Public health facilities.

Awareness Generation

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

Observance of important environment-health days

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

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

Capacity Building

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

Training Plan at District level

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

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

Annual training plan for Vector-borne diseases in context of climate change under NPCCHH, Tripura

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

Roles and responsibilities

State Climate Change & Human Health Cell

- Prepare advisory and disseminate to district level.
- Coordinate with other National health programmes like IDSP & NVBDCP for surveillance activities.
- Coordinate with multisectoral task force members in developing State Action plan for Vector-borne diseases.

- Capacity building of DNO-CC and MOs in coordination with IDSP & NVBDCP.
- IEC and awareness generation & dissemination planning in coordination with IDSP & NVBDCP.

District Climate Change & Human Health Cell

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

Block level

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

Health Facility level

- Reporting of VBDs.
- IEC and awareness generation.
- Capacity building of frontline health care workers.
- Hospital level preparedness.

Frontline Health Care Worker

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

CHAPTER 10

Action Plan for Green and Climate Resilient Health Care Facilities

"Climate-resilient and environmentally sustainable health care facilities anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stresses while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, so as to bring ongoing and sustained health care to their target population and protect the health and well-being of future generations. (WHO)". As the climate continues to change, risks to health systems and facilities – including hospitals, clinics, and community care centers – are increasing, reducing the ability of health professionals to protect people from a range of climate hazards. Healthcare facilities are the first and last line of defence against climate change impacts as they can be responsible for large emissions of greenhouse gases (GHGs), and because they provide the needed services and care to people harmed by extreme weather and other long-term climate hazards.

Framework for building climate-resilient and environmentally sustainable HCF

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

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

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

a. Energy Auditing

b. Installation of LED lighting at Health Care Facilities

c. Installation of Solar panels

d. Water Conservation Measures – Rain water Harvesting

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

Environmentally Sustainable (Green) Measures at Health Care Facilities

a. Energy Auditing

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

The guiding principles in this respect include:

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

b. Replacing the existing non-LED lights with LEDs

Replacing the incandescent bulbs with LEDs leads to 75% less energy consumption. Each LED light saves approximately INR 700-1400 over the course of a year. The guiding principle in this respect would be:

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

c. Installation of Solar panels

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

The guiding principle in this area would be:

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

d. Water conservation

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

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

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

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

Climate Resilient Infrastructure at Health Care Facilities Including Retro Fitting of Existing Health Care Facilities

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

New Buildings

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

- Installation of Rainwater Harvesting System
- Installation of alternative energy systems
- Installation of STP & ETP

Existing Infrastructure

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

Activity plan

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

Activities	Year 2022-23	Year 2023-24	Year 2024-2027
a. Energy auditing in Healthcare Facilities	Rs. 136.81 lakh	Rs. 126.30 lakh	Budget will be calculated as per no. of health facilities/ districts targeted. All districts will be targeted till 2027 for Climate resilient health infrastructure
b. Replace existing lighting (Non-LED) with LED			
c. Installation of Solar Panels			
d. Install Rainwater Harvesting System			
e. Retrofitting Healthcare Facility Infrastructure (Climate/ Disaster resilient) in Districts as per IPHS guidelines			

Objective	Activities	Priority districts	Identified Health facilities for 5 years for each	Target for 5 years 2022-27				
				2022-23	2023-24	2024-25	2025-26	2026-27
Strengthening Healthcare System	Energy Audit	All 8 districts	1 PHC, 1 CHC, 1 DH	20%	35%	50%	75%	100%
				10%	20%	50%	80%	100%
	Led installation		1 PHC, 1 CHC, 1 DH	10%	20%	50%	80%	100%
	Solar Panels installation		1 PHC, 1 CHC, 1 DH	5%	10%	40%	70%	100%
	Rainwater Harvesting		1 PHC, 1CHC, 1DH	5%	10%	20%	50%	100%
	Retrofitting of Health care facilities		1 PHC, 1 CHC, 1 DH	10%	20%	50%	80%	100%

Roles and Responsibilities

State level Climate Change and Human Health Cell

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

District level Climate Change and Human Health Cell

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

Block level/Health facility level

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

Medical officer

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

Panchayati Raj Institution

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

PART III

Budget

CHAPTER 11
Budget

Budget for FY 2022-24

Sl. No.	Activities		Year 1	Year 2
1	Infrastructure - Civil works (I & C)	Old/ongoing Work	0	0
		New Work	25,00,000	25,00,000
2	Capacity building inclusive training		3,00,000	3,00,000
3	Others including operating costs (OCC)		1,36,81,000	1,26,30,000
4	IEC and Printing		12,00,000	12,00,000
5	Planning & ME		4,70,000	5,00,000
6	Surveillance, Research, Review, Evaluation (SRRE)		1,00,000	1,00,000
	Total		**1,82,51,000**	**1,72,30,000**

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

Tentative Budget for FY 2024-27 (with a tentative 15% increase)

Sl. No.	Activities		Year 1	Year 2	Year 3
1	Infrastructure - Civil works (I & C)	Old/ongoing Work	0	0	0
		New Work	29,00,000	32,50,000	36,25,000
2	Capacity building inclusive training		3,50,000	4,00,000	4,50,000
3	Others including operating costs (OCC)		1,50,00,000	1,50,00,000	1,50,00,000
4	IEC and Printing		14,00,000	16,00,000	18,00,000
5	Planning & ME		5,50,000	6,00,000	6,50,000
6	Surveillance, Research, Review, Evaluation (SRRE)		1,00,000	1,00,000	1,00,000
	Total		**2,03,00,000**	**2,09,50,000**	**2,16,25,000**

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