Ministry of Health and Family Welfare

Government of India

STATE ACTION PLAN FOR CLIMATE CHANGE & HUMAN HEALTH

West Bengal

(Revised Version- 24.05.2023)

National Programme on Climate Change & Human Health
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Ministry of Health and Family Welfare
Government of India

सत्यमेव जयते

Azadi Ka Amrit Mahotsav

West Bengal

State Action Plan for Climate Change and Human Health 2022-2027

National Centre for Disease Control
Government of India

National Programme on Climate Change and Human Health

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State Action Plan on Climate Change & Human Health

Chapter 1: Introduction

Climate change is emerging as the biggest threat to the health and well-being of the human race. It increases the risk of occurrences of extreme heat events, floods, droughts, and heavy storms, consequently leading to the multiplication of the risks of asthma attacks, obstructive lung diseases, and cardiovascular diseases. Climate change is also causing a change in the pattern of the spread of certain diseases carried by ticks and mosquitoes. Globally, there is increased evidence indicating these health impacts due to climate change.

While the entire human race is affected by the risks posed by climate change; the majority of people affected are the ones who contribute least to its cause, i.e. the most vulnerable and disadvantaged groups including women, children, migrants, or displaced persons, older population, and population with underlying health conditions, specifically belonging to the lower-income communities in poorer countries who are also least equipped to protect themselves against these catastrophic impacts of climate change. Furthermore, climate change is undermining many of the social determinants for good health, such as livelihoods, equality, and access to health care and social support structures.

Climate change can exacerbate existing health threats or create new public health challenges through a variety of pathways. The origination and the evolution of diseases depends on the epidemiological triad composed of disease agent, host, and environment. Climate changes may tell on each of these three fronts. These are well known to change the distribution, prevalence and character (even species) of disease agents, the term ‘agent’ being taken in a broad sense inclusive of infective as well as non-infective causation. Climate is also known to affect the host factors i.e. the internal characteristics of the living organisms, making them more vulnerable to ill health. Changes are occurring not only in the domain of human beings but also in that of animal health. An increase in zoonotic diseases again predisposes mankind to more disease problems, since animal and human infections are often inter-changeable. Disruption of environmental equilibrium usually comes more in favor of disease transmission by changing the vehicle of infection, bringing human beings closer to the disease agents, and altering the survival, distribution, and reproduction of disease vectors (vector mosquito, fly, flee, ticks, etc.).

To address these emerging issues due to climate change globally, 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 the "Rio Convention 1992", "Kyoto Protocol 1997", "Male' Declaration 1998", "Convention of Parties", "Cancun Agreement 2010", "Durban Platform 2011", and the "Nationally Determined Contributions" (NDCs) at the Conference of Parties 21".

India is a signatory to the "Male' Declaration", which highlights the strengthening health sector to make it climate resilient. According to the Male Declaration, it is desired that healthcare facilities should be prepared to be climate-resilient, particularly to encourage that these can withstand any climatic event and that essential services such as water, sanitation, waste management, and electricity are functional during such events. Further, for climate-resilient healthcare, the health department has to undertake measures to initiate the greening of the health sector by adopting environment-friendly technologies and using energy-efficient services.

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

National Centre for Diseases Control (NCDC) is identified as the 'technical nodal agency' by the MoHFW for the proposed National Mission on Health. The Centre for Environmental and Occupational Health Climate Change & Health (CEOH&CCH), NCDC, Delhi, is implementing the National Programme of Climate Change and Human Health (NPCCHH), under which West Bengal state has prepared its State Action Plan on Climate Change and Human Health (SAPCCHH). The SAPCCHH is a long-term vision and planning document prepared by the Department of Health & Family Welfare, West Bengal, applicable up till the year 2027. Based on this document, district-specific action plans will also be prepared. The West Bengal SAPCCHH highlights the current and future vulnerabilities to climate change in the state, the disease burden, and the initiatives to be undertaken by the state to reduce the disease burden and develop a climate-responsive and sustainable healthcare ecosystem.

Chapter 2: Climate Vulnerability

Climate-sensitive diseases are on the rise due to the direct or indirect effects of global warming and other extreme weather-related conditions. These effects are widespread, affecting a large section of the population, and more pronounced, for the vulnerable/ less privileged segments (children, old age persons, tribal populations, employees of unorganized sectors, high population density areas, unplanned urbanization, etc.). A state-wide action plan with multi-sectoral involvement is necessitated to support minimization of environmental changes and a reduction in the impact and intensity of hazards, so as to mitigate climate change concerns. Dept. of Health & Family Welfare (H&FW) has to play a pivotal role in this whole process with emphasis on awareness generation and health effect mitigation.

As per details from Census 2011, West Bengal has a population of 9.13 crores, an increase from a figure of 8.02 crores in the 2001 census. Out of the state population of 91,276,115 (2011 census), males and females are 46,809,027 and 44,467,088 respectively. The decadal growth of the population is 13.93% and the population density is 1029/km2. The tribal population proportion is 5.8%.

Vulnerability of West Bengal

The state of West Bengal is prone to climate change and its impacts. The concern of climate change is exacerbated by certain socio-economic conditions in the state, in addition to the demographic conditions. A few of these include the presence of highly vulnerable Sundarbans, high population density, presence of biodiversity hotspots, the state as the center of production for crop plants, high incidence of cyclonic events in terms of per km occurrence, the threat of glacial lake outburst in Bhutan and Sikkim. Furher, in terms of demographic indicators, the districts of North 24 Parganas, South 24 Parganas, and Purba Medinipur have a high population density and are situated on the coast due to which they are vulnerable to extreme weather events like cyclones and flooding. For this reason, they deserve extra attention while monitoring the program.

MAP OF WEST BENGAL (Fig 2.1)

Brief Appraisal of the Existing Health System

Different tiers of Medical Care Facilities in the state- (Table 2.1)

S. No	Facility	Number
1	MCH	13
2	DH turned into new MCH	10
3	DH	13
4	SDH	36
5	SGH	24
6	Stand Alone SSH	11
7	De-Centralized Hospitals	2
8	RH/BPHC (CHC)	349
9	PHC including newly declared PHC	915
10	Newly Declared PHC	7
11	UPHC	459

All the Medical Colleges, District Hospitals, Super-specialty Hospitals, and selected SDH/ SGHs are equipped with CCU/ HDU with the integration of multi/super-specialty services for any kind of emergency. The need of the hour is the convergence of available resources, capacity building, and awareness generation among medical faculties to render focused service for climate-sensitive illnesses.

Climate Vulnerability

A . Temperature

West Bengal has 6 agro-climatic zones, namely the Hill zone, Terai zone, Old alluvial Zone, New Alluvial zone, Red and laterite zone and coastal and saline zone. The details of coverage of these zones, locations, physiography and climate are indicated in Table 3.1. The average temperature in West Bengal ranges between a minimum of 8.4oC in the Hilly region to a maximum of 37oC in the red and laterite zone. The rainfall varies from a minimum of 1100 mm in the red and laterite zone to a maximum of 3500 mm in the hilly region.

Analysis of Indian Meteorological Department (IMD) data obtained from 19 surface meteorological stations in West Bengal for the period 1951 and 2010 indicates that there is an

increasing trend of +0.010C per year in the annual mean maximum temperature. However, there is no annual trend in the annual mean and annual mean minimum temperatures. Seasonal trends are noted in Table 2.2 (Rathore et al., 2013[2]). Another analysis[3] of 37 years of IMD data (1969-2005) suggests the changes in temperature also vary spatially (Table 2.1). Considering that the time period for analyses in Table 2.3 (1969-2005) is a subset of time period for the work carried out by Rathore et al 2013 (1951-2010), the rate of increase in maximum temperature is accepted as $+0.01^0$ C per year for further work in this report. However, the reason for observing no annual trend in mean minimum temperature and mean temperature (Table 2.2) is due to different degree of changes in different seasons and also due to varied degree of climatic responses in the six spatially different agro-climatic zones of West Bengal, which is apparent from Table 2.3

Table 2.2: Temperature Trends in West Bengal between 1951 and 2010[4]

Parameters	Annual	Winter	Summer	Monsoon	Post Monsoon
Mean Max. Temp. Trend (ºC/yr)	+0.01	No Trend	-0.01*	+0.02*	**+0.02***
Mean Min. Temp. Trend (ºC/yr)	No Trend	+0.01*	No Trend	No Trend	**+0.01***
Mean Temp. Trend (ºC/yr)	**No Trend**	**No Trend**	**-0.01***	**+0.01***	**+0.01***

*trends significant at 95% level of significance

Table 2.3: Change in of Diurnal Difference of Temperature in six agro-climatic zone[ii] between 1969-2005

Change in Zones	Hill zone	Terai zone	Old Alluvial	New Alluvial zones	Laterite zone	Saline Coastal zone
Maximum Temp.	-0.25ºC	-0.25ºC	-0.25ºC	-0.5ºC	-0.5ºC	**-0.5ºC**
Minimum Temp.	$+1.5^0$C	$+1.5^0$C	$+1.5^0$C	$+1^0$C	+0.5ºC	**$+1^0$C**
Net Reduction in diurnal difference	**1.75^0C**	**1.75^0C**	**1.75^0C**	**1.5^0C**	**1^0C**	**1.5^0C**

An analysis of 116 years of data (1901 - 2016) by IMD again illustrates that all three anomalies for mean temperature, maximum temperature and minimum temperature are showing increasing trends at various rates (Figure 3.1-3.4). During the same period, the trend of all India anomaly of mean temperature also showed an increasing trend (Figure 3.4). Spatial analysis by IMD for 116 years of data (1901 to 2016) also shows significant increasing

trends of annual mean, annual mean maximum and annual mean minimum temperatures (Figures 3.5, 3.6 and 3.7) for most of the districts of West Bengal, which corroborate the observation that temperature is increasing in West Bengal.

References : State Action Plan on Climate Change 2012, page 46, http://www.moef.nic.in/sites/default/files/sapcc/West-Bengal.pdf

4 4 Rathore L S, S D Attri and A K Jaswal, 2013. STATE LEVEL CLIMATE CHANGE TRENDS IN INDIA Meteorological Monograph No. ESSO/IMD/EMRC/02/2013. Published by IMD. Available at:

http://www.imd.gov.in/section/climate/StateLevelClimateChangeMonoFinal.pdf

Extreme events

Rainfall: Further a study by Goswami et al[16], suggests significant rising trends in the frequency and magnitude of extreme rain events and a significant decreasing trend in the frequency of moderate events over central India during the monsoon seasons from 1951 to 2000 and more intense rain fall events over the central Indian region and in some parts of West Bengal (Northern parts of West Bengal including the Himalayan region and the southern part , which has the Sundarbans region).

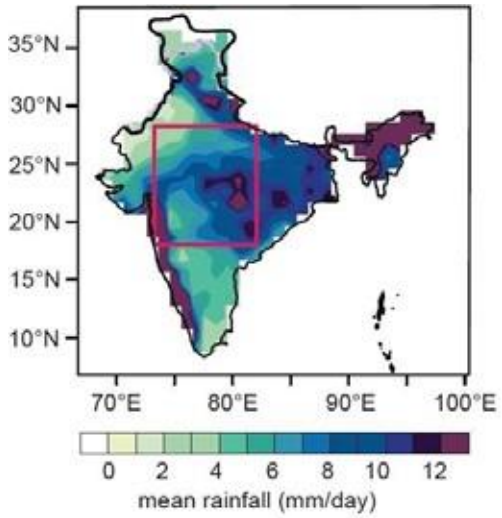

Figure 2.2: Trends of extreme rainfall events in India during 1951-

2000[17] Source: Goswami et al., 2006

It may be summarized that although the total rainfall is decreasing but extreme weather events are increasing due to new occurrence of sharp gradient between land surface temperature and SST (Sea Surface Temperature). The differences presented by different studies may also be attributed to the low weather monitoring stations of this region.

[16] Goswami, B. N. *et al*. Increasing trend of extreme rain events over India in a warming environment. *Science* **314**, 1442-1445 (2006)

[17] Goswami, B. N. *et al*. Increasing trend of extreme rain events over India in a warming environment. *Science* **314**, 1442-1445 (2006)

Cyclones*:* West Bengal had 69 occurrence of cyclones between 1891 and 2013 (Mishra, 2014)[18]. Studies (Mooley, 1980[19]; Rao, 2002[20]; Knusten and Tuley, 2004[21]; Emanual, 2005[22]; Landsea, 2005[23]; IPCC, 2007[24]; and Muni Krishna , 2009[25]; and Yu and Wang [26]) have shown that though the occurrence of tropical cyclones is declining but the frequency of severe cyclonic storms with wind speeds between 118-167 kmph is increasing noticeably. This has been attributed to rising sea surface temperature. The occurrences of extreme weather conditions during 2013-2017 is shown in Table 2.4.

Table 2.4: Occurrences of Extreme Weather events, which affect health in last five years:

Weather events	**2013**	**2014**	**2015**	**2016**	**2017**
Cold Wave:	January 8th to January 26th,	February 2nd, 3rd 18th	January 31st, February 1st ,	January 24th & 25th	**January 15th & 16th**
	27th 29th &		December 25th		
	30th. February 10th				
	Novemb er 16th				
Heat wave	April 9th to	March 29th to	May 22nd to	April 7th to	**March 31st**
	11th & 14th	31st, April 1st,	24th, June 8th	17th, 20th, 30th,	**and April 3rd**
	May 2nd & 3rd	24th to 30th,	to 11th	May 1st	
		May 9th, 12th			
		to 23rd, June			
		12th to 16th			
Nos. of			**Cyclone**		

18 Mishra Ashutosh, 2014. Temperature Rise and Trend of Cyclones over the Eastern Coastal Region of India. J Earth Sci Clim Change 2014, vol 5, Issue 9.

[19] Mooley DA (1980) Severe cyclonic storms in the Bay of Bengal, 1877-1977. Mon Wea Rev 108: 1647-1655. 7.

[20] Rao YR (2002) The Bay of Bengal and tropical cyclones. Curr Sci 82: 379-381.

[21] . Knutson TR, Tuleya RE (2004) Impact of CO2 -induced warming on simulated hurricane intensity and precipitation: sensitivity to choice of climate and convective parameterization. J Climate 17: 3477-3495.

[22] Emanuel K (2005) Increasing destructiveness of tropical cyclones over the past 30 years. Nature 436: 686-688.

[23] Landsea CW (2005) Hurricanes and global warming. Nature 438: 11-13.

[24] IPCC (2007) Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva, Switzerland.

[25] Muni Krishna K (2009) Intensifying tropical cyclones over the North Indian Ocean during summer monsoon – Global warming. Global Planetary Change 65: 12-16.

[26] Yu J, Wang Y (2009) Response of tropical cyclone potential intensity over the north Indian Ocean to global warming. Geophy Res Let 36

Weather events	2013	2014	2015	2016	2017
cyclones			'Komen' during 31st July to 1st August over Gangetic West Bengal		
No. of episode of floods (Based on media report as IMD is only issuing heavy forecast & warning)	July 21st to 31st in Gangetic West Bengal	July 24th & 25th over North Bengal, August 23rd to 25th over Haora & Hooghly district	July 29th to 31st over Haora, Purulia Burdwan, Bankura, South 24 Pargana, Jalpaigurhi August 1st to 4th over Haora, Burdwan, east and West Midnapore, Bankura, North and South 24 parganas, Nadia, Puruliya, Hooghly, **Birbhum**	NIL	**July and August , 2017 in North Bengal**

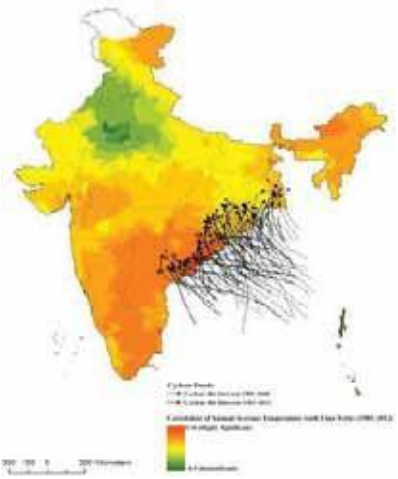

Figure 2.3: Cyclone Tracks Along The Bay Of Bengal Entering The East Coast Of India during 1901-2013
Source: Misra, 2014[9].

Droughts: A Study by Mallaya et al. (2016)[27] of drought characteristics for the Indian monsoon region analysed using two different datasets (IMD daily gridded precipitation data set at 1° resolution and University of Delaware/NOAA monthly precipitation data set at 0.5° spatial resolution) and standard precipitation index (SPI), standardized precipitation-evapotranspiration index (SPEI), Gaussian mixture model-based drought index (GMM-DI), and hidden Markov model-based drought index (HMM-DI) for the period 1901–2004, indicates that irrespective of the precipitation datasets and methodology used, the droughts appear to be migrating to the agriculturally important regions such as the Indo-Gangetic plains (of which West Bengal is a part) in recent years implying higher food insecurity and socio- economic vulnerability of this region.

Other Hazards: West Bengal across its various physiographic regions is annually experiencing landslides, floods, droughts, storm surges, because of which large scale damages are reported in terms of area inundated, crop loss, livestock and human mortalities, nutritional deficiencies, increase in DALY's (Disability Adjusted Life Years), as well as housing, tele-communication networks, electricity distribution systems and other infrastructure including roads, embankments and river banks. The level of impacts and hence damages are likely to escalate as rainfall, temperature, droughts, storm surges intensify and sea levels rises[28].

[27] Ganeshchandra Mallyaa, Vimal Mishra, Dev Niyogi, Shivam Tripathi, Rao S. Govindaraju, 2016. Trends and variability of droughts over the Indian monsoon region. Weather and Climate Extremes. Vol.12, pg 43-68. Elsivier open access journal. Available at: https://www.sciencedirect.com/science/article/pii/S2212094715300578

[28] IPCC, 2013. Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Available at: http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf

Chapter 3: Vision, Goal, & Objectives

State Action Plan on Climate Change & Human Health (SAPCCHH) sets a holistic and rational perspective before the health care system so that climate resilient and responsive actions can take a pre-planned, coordinated, and sustained course, along with surge activities at times of need.

3.1 Vision

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

3.2 Goal

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

3.3 Objective

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

Specific Objectives

Objective 1

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

Objective 2

To strengthen the capacity of the 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's impact on human health.

SAPCCHH is purported for the following:

- It describes the system and programmes that are already in place to address climate-sensitive health issues.
- It outlines the direction that needs to be taken in strengthening the healthcare system to be climate resilient and responsive.
- It indicates the areas of convergence with other stakeholder departments and organizations that need to be roped in for the above measures to materialize.

Protecting health from climate change

Climate change is a global challenge that needs the action from all people. In late 2015, to address climate change, more than 190 countries approved Paris Agreement at the 21st session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris. In the agreement, all countries agreed to work to limit global temperature rise to well below 2 degrees Celsius and to make best efforts to keep it to 1.5 degrees Celsius, for the achievement of the Sustainable Development Goals. Meeting the goals of the Paris Agreement could save about a million lives a year worldwide by 2050 through reductions in air pollution alone.

In 2017 WHO launched a Special Initiative on Climate Change and Health in Small Island Developing States. While these countries contribute very little to causes of climate change, they are among the most vulnerable to climate change impacts.

India laid strong foundations for greater global cooperation on climate action through its pledge for Paris Agreement. India has committed to cut its emission intensity of gross domestic product (GDP) by 33-35% of 2005 levels by 2030.

Promotion of renewable energy by Indian government is a strong commitment towards climate change. There's a lot we can also do in our daily life to prevent climate change including use of climate friendly transportation, save energy, go solar, harvest rain water, reduce waste and promote urban green spaces.

Positive co-benefits

Steps to reduce greenhouse gas emissions can have more immediate positive health effects, such as promoting the use of public transportation and active movement (biking or walking as alternatives to

using private vehicles) reduces carbon dioxide emissions and air pollution; and helps prevent diseases like diabetes, heart disease and cancer.

We have a much better future in store for us if we act quickly and make significant changes in our lifestyle.

Some ways to save energy and reduce GHG emissions

- Replace old appliances with energy efficient models and light bulbs.
- Save electricity by turning the gadgets off completely when not in use, including computers.
- Recycling paper, plastic, glass &aluminum keeps landfills from growing. **Reduce, reuse, and recycle waste.**
- Shop local. Supporting neighborhood businesses keeps people employed and helps prevent trucks from driving far distances.
- Green your surroundings.
- Bike, walk or take public transport. Save the car trips for when you've got a big group.
- For regular journeys, use a car pool instead of separate vehicles for individuals.
- Use renewal energy. If you have the option, install solar panels in your house.
- Use a refillable water bottle and coffee cup. Cut down on waste.
- Bring your own bag when you shop.
- Compost—composting food scraps can reduce climate impact while also recycling nutrients.

Health Adaptation Plan should underscore, in general, the importance of behavioral change at organization, community & individual levels.

The above are some key messages that should be incorporated in health awareness communications. These are cornerstones of Health Action Call for Climate Change.

Chapter 4: Organizational Framework

The Nodal Branch in the State Health Dept. for National Programme for Climate Change & Human Health (NPCCHH) is the **Public Health & Communicable Diseases Branch**. This branch is headed by a Jt. DHS under whom there are two Dy. Directors – DDHS(Malaria) for the Vector Borne Diseases and DDHS (PH) for other public health matters in relation to communicable diseases (except Tuberculosis, Leprosy & HIV/AIDS) e.g. IDSP, NVHCP, NRCP, Disaster Management, Influenzas, emerging diseases like Nipah, Scrub Typhus, etc.

NPCCHH falls in the domain of DDHS (PH). There are two Asst. DHS-s and one DADHS who look after the different programmes. They are responsible for and help the DDHS (PH) in the implementation of NPCCHH in the cross-cutting areas. Another DADHS, although placed under the DDHS (Malaria), supports the IDSP as the State Nodal Officer. Moreover, there are Contractual Consultants of IDSP (e.g. State Epidemiologist, State Veterinary Consultant, State Entomologist, etc.) and two Specialists of Community Medicine (working in PH & CD Branch on detailment), who work under these officers and are involved in the formulation of the State Plan and its implementation.

A senior Professor of Community Medicine has been designated by Govt. Order as the State Nodal Officer for NPCCHH. The programme has started functioning in the State under his overall guidance. The day-to-day activities are carried out by the PH & CD Branch.

At the District level, the District Leprosy Officer, a senior Officer in the PH cum Administrative Cadre, has been identified as the District Nodal Officer. In districts where there is no sanctioned post of District Leprosy Officer, the Asst. CMOH of the Sadar Subdivision would hold the charges of DNO. The Dy. CMOH-II, the District Officer in charge of the Public Health Programmes, will act as the Public Health Liaison Officer for NPCCHH.

In addition to the organizational structure described above, there are Rapid Response Teams (RRT) at every level, namely state, district, and block levels. The RRTs are responsible for prompt response to public health emergencies.

Training programmes for RRTs at all levels have been organized. Re-orientation is also planned from time to time. Initiatives have been taken to enable the Block level functionaries to analyze surveillance and use them for public health action. Keeping the increasing importance of zoonoses in view, representatives of the Dept. of Animal Resource Development have been inducted into the RRTs up to

the block. To strengthen the technical quality, Specialists/Faculties of Medicine, Pediatrics. Medicine, Microbiology/ Pathology have been included in the state and district RRTs.

Multi-Sectoral Task Force:

For efficient preparation and execution of the State Action Plan on Climate Change and Human Health (SAPCCHH) a multi-sectoral task force had been formed on 23.09.2019 (order below). The first meeting of the multi-sectoral task force was held on 27.01.21.A working group was also formed under the guidance of the State Nodal Officer to develop the draft SAPCCHH. The process has unfortunately got delayed due to the pandemic situation.

Government of West Bengal
Department of Health & Family Welfare
(PHP Branch)
Swasthya Bhawan, GN-29, Sector-V
Bidhannagar, Kolkata-700091

Memo. No. 545-HFW-I8099/4/2018-PHPSEC **Date:** 23.09.2019

O R D E R

Sub: **Formation of 'Multi-sectoral Task Force' for implementation of the State Specific Action Plan for Climate Change and Human Health (SAPCCH)**

Ministry of Health & Family Welfare, Government of India has issued guidelines for strengthening of State health system for making it climate change Resilient vide D.O.No.720/16-08/2016-CEOH(NCDC)(Pt.19)dated27thMarch,2018(copyenclosed).IthasbeenproposedtodraftStateSpecificActionPlanfor Climate Change and HumanHealth(SAPCCHH).Also, anEnvironmentalHealthCellistobeformedwiththeofficialsfromdifferentconcerneddepartments.ApublichealthexpertwouldfunctionastheNodal Officer.Undertheabovescenario,theundersignedisdirectedtostatethata'Multi-sectoral TaskForce'isherebyformedwiththeofficialsfromvariousbranchesofthisDepartmentaswell asofficialsfromother concerned Departments as shown in the table below :

SI. No.	Name of the Post	Name/Designation of the officials
1	State Nodal Officer	Prof. Raghunath Mishra, Prof. of Community Medicine and MSVP, IPGMER Mobile No: 9433832862, E-Mail: msvpsskm@gmail.com
2	Member	Additional Mission Director, National Health Mission, Deptt. of Health & Family welfare.
3		Joint Secretary to the Govt. of *W.B*, PHP Branch, Deptt. of Health & Family Welfare.
4		Deputy Director of Health Service (Malaria), Directorate of Health & Family Welfare.
5		Deputy Director of Health Service (Public Health), Directorate of Health & Family Welfare.
6		Deputy Director of Medical Education, Directorate of Health & Family Welfare.
7		Deputy Director of Health Service, NCO-II, OirectorateofHealth&FamilyW'elfare.
8		Assistant Director of Health Service (EC, NC & ES), Directorate of Health & Family Welfare.
9		Sri T. Talukdar, Scientist ' D ' , Central Ground Water Board, Eastern Region, Salt Lake, Kolkata.
10		Dr. G.K. Das, Scientist ' D ' & Director, India Meteorological Deptt.Cont.no: 9836213781, e-mail :imdgkdas@gmail.com
11		Dr. Tapas Kumar Gupta, Chief Engineer, Planning & Waste Management Cell,west Bengal PollutionControlBoard.
12		P. Suresh Babu, Deputy Director (s), Ministry of Environment, Forest&ClimateChange,Govt.ofIndia,Cont.no:8008143846.
13		**Dr. Abhik Sinha, Scientist-' C', ICMR,** **National Institute of Cholera & Enteric Diseases.**

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ng informed accordingly for compliance.

Enclo: As stated

Core Committee under Chief Secretary:

Although the Governing Body has not yet been formed in the state (under due process), there is a Core Committee that functions under the chairmanship of the Chief Secretary. This Committee consists of the Secretaries of the stakeholder Departments of State Govt. It is primarily meant for prevention of vector-borne diseases. However, it also discusses environmental matters that have bearings on the mitigation of climate-sensitive issues.

Environmental Health Cell:

In pursuance of MOHFW D.O.No.720/16-08/2016-CEOH(NCDC) (Pt.19) dated 27th March 2018 Environmental Health Cell has been formed in the State Headquarters for the conduct of day-to-day work of NPCCHH. This Cell facilitates sharing of data between the different wings of Health & FW Dept. There are many Officers and Consultants in the Department whose domains of work are linked to climate change issues. The Environmental Health Cell will help to create synergy among them in the interest of the programme. Cell is composed as mentioned in the order below-

Government of West Bengal
Health & Family Welfare Department (PHP Branch)
Swasthya Bhawan, GN-29, Sector V
Salt Lake, Kolkata 700091

No.113- HFW-18099/4/2018-PHP SEC Dept. of H&FW 19/04/2021

ORDER

Subject : Formation of " Environmental Health Cell" for implementation of the State Specific Action Plan for Climate Change and Human Health (SAPCCHH).

Ministry of Health & Family Welfare, Government of India has notified a guideline for strengthening of State Health System for making it climate change resilient vide D.O.No.720/16-08/2016-CEOH (NCDC) dated 27th March 2018 (copy enclosed). It has been proposed to draft State Specific Action Plan for climate change and Human Health (SAPCCHH).Also, an Environmental Health Cell is to be formed with the officials from concerned department.

Under the above scenario, the undersigned is directed to state that a "Environmental Health Cell" is hereby formed with the following officials from various Branches of this Department shown in the table below.

Sl.No	Name of the Post	Name and Designation of the Official
01.	Cell Head	Shyamal Mondal, Joint Secretary
02.	Member	Jt.DHS, (PH&CD)
03.	Member	Dr.Suparno Pal, Technical Officer, SPSRC
04.	Member	ADHS, Epidemiologist-IBD
05.	Member	ADHS,Epidemiologist-PH
06.	Member	ADHS/DADHS, Maternal Health
07.	Member	ADHS/DADHS, Child Health
08.	Member	State Nodal Officer, IDSP
09.	Member	State Epidemiologist, IDSP
10.	Member	Community Medicine Specialist (Supy,Bond Duty), at PH & CD Branch
11.	Member	State Data Manager ,IDSP
12.	Member	State Veterinary Consultant ,IDSP
13.	Member	State Microbiologist ,IDSP
14.	Member	State Entomologist, IDSP
15.	Member	State Entomologist, NVBDCP
16.	Member	Consultant (Vector Control), NVBDCP

This issues in supersession of previous order issued in this regard.

All concerned are being informed accordingly.

19/4/21
Joint Secretary

District Nodal Officer (CC & HH):

As per the recent redistribution of duties and responsibilities of district-level officers in the Dy.CMOH rank, the Dy.CMOH –II is the officer in charge of NPCCHH. Hence the Dy.CMOH –II is to be considered as the District Nodal Officer (CC & HH) of the respective district.

Job chart of the Deputy CMOH

Job chart of Dy. CMOH-I

1. All infrastructure issues of CMOH
2. Vehicle and Mobile Medical Unit
3. Procurement of drug, equipment, consumable through SMIS
4. Local procurement / Non CAT procurement
5. Nodal Officer DPMU
6. Establishment Section.
7. Nodal Officer HR recruitment & HR Management
8. E-tender Inviting Authority
9. Nodal Officer legal matters
10. Nodal Officer Clinical Establishment
11. Rogi Sahayata Kendra
12. All IEC Matters
13. Any other activities assigned by the authorities from time to time

Job chart of Dy. CMOH-II

1. Program Officer/Nodal Officer for following Programmes
    a. Communicable diseases under National Health Programmes excluding NLEP
    b. National Quality Assurance programme
2. Programme Officer Hospital performance including KPI, HMIS
3. Nodal Officer Sushree, Kayakalp
4. Nodal Officer Disaster Management
5. Programme Officer Climate Change (NPCCHH) Programme
6. Food Safety
7. Snake bite and Animal bite management
8. Any other activities assigned by the authorities from time to time

Job chart of Dy. CMOH-III

1. Programme Officer/Nodal Officer for following programmes
    a. Maternal Health Programme related all activities , incl. VHND, ANC,PNC, Institutional delivery, Midwifery, Maternal Death Review
    b. LaQshya, Labour Rooms (LDR + NBCC), MCH Hub, FRU, HDU/ICU-MH
    c. JSY, JSSK, PMMVY (BMP), SUMAN
    d. All FP Services - Sterilization –Female/Male, IUCD Insertion (PPIUCD and PAIUCD), Antara, FPIS, FPLMIS, World Population Day, CAC
    e. FW Store (all programme), Fund management of related programme
    f. Implementation of RCH portal/ANMOL/ Matrimaa Portal
    g. Dial 102 ambulance services and other JSSK ambulances services.
2. Coordinating Officer for all ASHA related activities including ASHA incentives.
3. Any other activities assigned by the authorities from time to time.

Further strategy

Actions for organizational strengthening are supposed to flow in the following direction:

- Formation of a Governing Body for NPCCHH according to GOI guidelines.
- Formation of the District Task Force (DTF) in every district.
- Meetings of the Multi-Sectoral Task Force, Governing Body, and DTF as per plan.
- Further training/ re-orientation of the RRT members
- Development of a more elaborate version of the State Action Plan in furtherance of this version.

Chapter 5: Climate Sensitive Diseases Prevalent in West Bengal

In accordance with the disease burden in the state, the changing epidemiological and/or entomological scenario as well as the threats of individual diseases/ public health problems, the following disease conditions were tentatively short-listed for primary focus:

1) Dengue
2) Malaria
3) Japanese Encephalitis**
4) Heat Stress and related impacts
5) ARIs including Influenza.

Such prioritization was a sequel of the National Planning Meeting on Climate Change & Human Health for the Eastern & NE States held in Kolkata in 2016, where NCDC (GOI) suggested all the participating States to identify several focus areas for detailed planning and sustained action.

Rationale for selecting the particular diseases:

(a) Dengue: -

- Urban disease extending its limit to affect peri-urban & rural areas due to continuing unplanned/ less planned urbanization
- Disease pathology changing characteristics; more of organ involvement warranting critical care
- Change in serotypic pattern
- Change in vector predominance: Aedes albopictus gaining importance

(b) **Malaria**: -

- Parasite is likely to develop drug resistance with time
- New species may emerge
- New endemic foci may appear
- Vector may become resistant to insecticides
- Challenge of forest malaria – very difficult to prevent

- Asymptomatic malaria

(c) **Heat Stress & Related Impacts**:

- As heat related events are being reported almost regularly during the summer months, thus it is an impending problem.
- In last few years drastic increase in temperatures has been noted which is causing significant impact on public life.

(d) **Influenza:**

- Notifiable disease.
- Previously it was seen that upsurge in cases was only during rainy season (July – October) but currently two trends have been noted one during rainy season and the other during late winters.
- Round the year cases are been noted.
- High risk disease.
- Often a zoonotic entity

** Japanese Encephalitis has long been recognized as a disease of paramount importance related to climate changes due to its high case fatality rate (20-30%) and ability to cause considerably prolonged morbidity as well as disability. But off late, the burden of the disease has decreased to a great extent in our state due to routine vaccination drive for the children and the special drives for the adolescents/ adults in different pre-identified hot spots. On the other hand, scrub typhus, a mite borne disease has emerged as a public health problem in the State during last few years.

Disease prioritization (Revised):

In pursuance of the further communications from MOHFW (GOI) in the recent years, the priority disease list has been revisited and extended to cover further aspects of climate sensitive public health problems. This renewed exercise has been carried out in a participatory manner along with the members of the Working Group for drafting the State Plan.

The following diseases and/or public health problems are now identified as the focus areas for climate responsive planning under the broad heads suggested by MOHFW (GOI).

Sl. No.	Broad areas	Diseases/ Public health problems
A	Vector Borne Diseases	(i) Dengue, (ii) Malaria and (iii) Scrub Typhus
B	Diseases due to poor air quality	Acute Respiratory Illness (ARI)
C	Water Borne Diseases	(i) Acute Diarrhoeal Diseases (ADD), (ii) Fluorosis
D	Extreme weather events	(i) Heat related illnesses and (ii) Flood & Cyclone
E	Zoonotic Diseases	Influenza
F	Nutritional Deficiencies	Nutritional Anaemia

PART – II

Chapter 6: Health Adaptation Plan for Air Pollution and Acute Respiratory Illness

Air pollution has been recognized as the world's largest single environmental health risk. The Global Burden of Disease 2010 (GBD) ranked air pollution as a leading cause of death and disability in India. According to the World Health Organization's (WHO) Ambient Air Pollution database, 13 of the top 20 cities in the world with the highest annual levels of PM2.5 are now in India, with Delhi featuring at the top of the list. With relatively-weak policies to manage industrial, transport, and other emissions, and increasing economic activity and industrialization across the country, the situation is likely to get worse.

Addressing this problem will require a multi-sectoral approach, driven by environmental and health data, science, and evidence. The formulation, strengthening, and implementation of policies and programs are needed to tackle this major risk factor, these are enlisted below-

1. **Source-wise actions to reduce exposure:**

   a. Household air pollution: integration with GOI Project to supply cooking gas to BPL families at a subsidized rate.

   - Making clean sources available (i.e., electric cooking or gas (natural, bio, or liquefied petroleum), or
   - Making ubiquitously available sources (i.e., biomass) clean

   b. Vehicular pollution: recommend an "avoid-shift-improve" framework involving local traffic police and pollution control department.

   c. Trash burning: Controlling trash burning will require strict enforcement of existing legislation banning the practice (local police and community leader, PRI)

   d. Brick kilns and other local industries: developing and implementing emissions standards that are in line with the technology standards, enforcing bans on inefficient kilns by local authorities, and promoting alternative building materials and bricks.

   e. Large sources (such as industries and power plants): Industry and power plants will also need a siting policy to ensure these are not located close to densely populated habitats. Regular monitoring by the respective authority.

2. **Role of the Department of Health and Family Welfare:**

MoHFW has recognized that air pollution exposure (household and ambient) is responsible for a large proportion of the ill-health in India the corrective steps were taken as-

- Better integration of air pollution and public health policies- Air Act (1986)
- Integrate care pathways into existing national frameworks or programmes- RSBY
- Strengthen policy-making capabilities in the area of air pollution and health- establishment of a standing expert group

Role of other Departments and Agencies

- **Dept. of Agriculture** - Policy in place to promote multiple uses of crop residues and prevent their on-farm burning
- **Finance Dept.** - Analysis of the economic and financial implications of the health and other impacts of air pollution
- **Labor Dept. -**
  - ✓ Ensure regular health check- ups for early screening of NCD related risk factors among workers
  - ✓ Frame guidelines for health promoting workplaces, especially guidelines on indoor air quality and conduct workshops at different workplaces
  - ✓ Strengthen the capacity of ESI Hospitals to cater to the growing burden of respiratory diseases and NCDs
  - ✓ Exploring feasible options for RSBY to include OPD services for respiratory diseases, COPD, NCDs, etc.
  - ✓ placing the workplace in sites that are accessible through public transportation (ex. Metro) or non-motorized transport
- **Human Resource Development**-
  - ✓ Regular screening of school children for early detection diseases, which can be attributed to the existing air pollution
  - ✓ Inclusion of harmful health effects of environmental pollution (AAP and HAP) in the school curriculum, including current policies and mitigation practices that are designed to reduce air pollution
  - ✓ Improving the indoor air quality of educational institutions
- **Dept. of Women and Child Development**-Advocate through Self Help Groups and Mahila Mandals for the protection of women and children from significant exposure to smoke from biomass while inside the house. Awareness raising can be done to improve household ventilation to reduce smoke inhalation from lighting (ex. kerosene) or cooking fuels.
- **Environment Dept. and Pollution Control Board –** Sharing of data on Air Quality from time to time.
- **Public Works Dept.**

- **Transport Dept. –** They may engage in law enforcement and advocacy on citizens' role.
- **Police –** Especially Traffic Police may take the role of a positive change agent.
- **Dept. of Education –** Behavioral change initiatives among school & college students.

ACUTE RESPIRATORY ILLNESS

Acute Respiratory Illness includes diseases like Bronchial illness, Acute chronic bronchitis, or COPD, Pneumonia, etc. Air pollution is identified as a serious contributor to the ill health of people causing or exacerbating respiratory disease and cardiovascular illness in almost all age groups.

Air quality is a definite concern for Kolkata and Howrah in West Bengal. Kolkata was included in the list of 102 Indian cities covered under the National Clean Air Programme (NCAP). Later, 6 more towns in West Bengal have been included i.e. Asansol, Howrah, Barrackpore, Haldia, Raniganj, and Durgapur. A colour coded system has been established to communicate the air quality details and accordingly, health consequences of the same for the general population as indicated below-

Table: AQI levels, Health effects and Certain Protective Health Measures

Air Quality Index(AQI)# (Pollution level)	Possible Health Consequences	Advice for	
		General Population	Vulnerable Population*
Good (0-50)	Low risk	No special precautions	No special precautions
Satisfactory(51-100)	Minor breathing discomfort invulnerable population*	No special precautions	Do less prolonged or strenuous outdoor physical exertion
Moderate(101-200)	Breathing or other health related discomfort in vulnerable population*	Do less prolonged or strenuous outdoor physical exertion	Avoid prolonged or strenuous outdoor physical exertion

Poor (201-300)	Breathing discomfort in healthy peopleon prolonged exposure Breathing or other health relateddiscomfort in vulnerable population*on short exposure	Avoid outdoor physical exertion	Avoid outdoor physical activities
Very Poor(301-400)	Respiratory illness in healthy peopleon prolonged exposure Pronounced respiratory or other illnesses in vulnerable population* onshort exposure	Avoid outdoor physical activities, especially during morning and late evening hours	Remain indoors and keep activity levels low
Severe (401- 500)	Respiratory illness in healthy peopleon prolonged exposure Serious respiratory or other illnesses in vulnerable population* onshort exposure	Avoid outdoor physical activities	Remain indoors and keepactivity levels low

Infrastructure development: In the last several years, the State health systems have been strengthened in a big way to take care of critical cases. A large number of CCUs/HDUs and also a significant number of PICUs have been set up across the state. The number of beds has been increased in many of the pre-existing CCUs. A portal is maintained to monitor the number and the type of cases managed in the CCU/HDUs and the overall performance of the units. The existing strength of CCU/HDU beds may be seen in the table below. These units are a great support in serving the load of severe ARI cases and are now equipped with surge capacity as well.

Five Years Comparison ARI & Pneumonia

Year	Disease	Case	Death	Disease	Case	Death
2016	ARI	3419564	601	Pneumonia	60737	417
2017	ARI	3840955	462	Pneumonia	103210	477
2018	ARI	4226159	689	Pneumonia	268070	626
2019	ARI	4387414	979	Pneumonia	133388	831
2020	ARI	2785759	653	Pneumonia	68564	561

HEALTH ADAPTATION PLAN

AWARENESS GENERATION

Under the programme, awareness generation amongst all the relevant stakeholders including the common population, vulnerable communities, healthcare providers, and policymakers around the impacts of air pollution along with the ways to address the same is imperative. Thereby, under the programme, West Bengal state will conduct the following key activities-

a. IEC Campaign

The districts are aimed to create awareness through Information, Education and Communication Activities (IEC) through the development of locally and culturally acceptable messages by using communication materials such as posters, audio, and videos, organizing public health events, and issuing advisories related to air pollution.

The content for the IEC for air pollution-related issues will be provided by the State NPCCHH division. The state has already translated posters into the local or regional language (Bengali) and the role of the districts is to utilize these materials and disseminate them at all levels. In accordance with the IEC strategy, the Meghalaya state plans to implement the following IEC dissemination strategy:

Details of planned activities on awareness generation for air pollution-

Table 6.1: IEC DISSEMINATION PLAN FOR 5 YEARS 22-27

S. no.	IEC Content	Priority Districts	Dissemination Plan for 5 years	Timeline	Budget (in lakhs) for 5 years				
					22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
1.	***Posters***	*Priority 7 districts (North 24-Parganas, Howrah, Hooghly, Paschim Bardhaman, South 24-Parganas, Purba Medinipur & SMP) and subsequently all districts.*	*2 Posters for healthcare facilities in all districts*	*July to September*	*5*	*6*	*7*	*8*	*8.5*
2.	***Audio***		*Social Media (Facebook, Instagram, Twitter etc.)*	*September to November*					
3.	***Videos***								
4.	***GIF's***								
5.	***Public Health Advisories***		*1 in all the Healthcare facilities*	*October to December*					

Modes of IEC dissemination in the State:

- 1000 folk programmes (facilitated by magic shows and folk music) have been planned and are currently ongoing throughout the length and breadth of the state.
- At least one Village Health and Nutrition Day session conducted at the sub-center level is to focus on air quality and air pollution and its ill effects.
- Urban ASHA and FTS are being trained and sensitized on the deleterious effects of air pollution so that they in turn can sensitize the general public
- Dissemination of information focusing on air quality and pollution through wall writing in all the districts.

Public Health Advisories

Health advisory on air pollution has been formulated and shared with all the districts. It will be updated and revised from time to time as and when needed.

Observation of Special Days

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

Capacity building

Training programme has been planned for concerned District & Subdivision Level Officers of Health and the Block Medical Officers & other Medical Officers at the periphery. The programme will be rolled out in two stages in the online mode (currently) including a State level TOT followed by district-level sessions. Further, training sessions will be organized at the sub-block level wherein RBSK MOs, ASHA, and ANM workers will be prepared to disseminate information at the community health centers.

Since poor air quality has a pronounced impact on the health of pregnant women and children, the officers associated with maternal and child health (e.g. DMCHO, DPHNO, etc) will also be

involved in the training programme. State & District Level Officers associated with urban health will also be requested to participate.

Training on air pollution and various health impacts of air pollution:

TABLE 6.2: NPCCHH TRAINING PLAN AT THE DISTRICT LEVEL

Training Programme	Trainer	Participants	Training Content
Medical Officers (3 days)	DNO	MO (DH,CHC,PHC)	Air pollution-related illness • Air pollution-health impact, prevention measures • Surveillance case identification, reporting, and analysis with AQI • Health facility preparedness
Community Health Care Workers (HWC) (2 days)	MO	Community Health Workers (MPHW, ASHA)	
Panchayati Raj Institutions (1 day)	MO, MLHP	Panchayati Raj Institutions, communities	

Table 6.3 : SCHEDULE PLAN FOR TRAINING FOR 5 YEARS 22-27

Sl. no	Training program	Timeline	Target	Priority Districts	Budget (in lakhs) for 5 years				
					22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
01	DNO	August	100%	*7 districts (North 24-Parganas, Howrah, Hooghly, Paschim*	17.0	27.5	29.5	31.0	32.0
02	MO	September-October	100%						

03	Community Health Workers	October-November	100%	*Bardhaman, South 24-Parganas, Purba Medinipur & SMP)*					
04	Panchayati Raj Institutions	November	100%						

Surveillance for ARI

In order to monitor the impact of air quality on respiratory health, surveillance of ARI i.e. acute respiratory illnesses is to be conducted in major hospitals of cities where extremely poor air quality levels are present. Initially, Kolkata and Howrah have been chosen as the cities for surveillance. Later, two more NCAP cities i.e. Barrackpore and Asansol, and one (1) non-NCAP city i.e. Hooghly have been brought under purview. So, presently six (6) hospitals named below are participating in the ARI Surveillance.

S. No.	City	Category	Sentinel Hospital
1	Kolkata	NCAP City	NRS Medical College & Hospital
2			MR Bangur Hospital
3	Howrah	NCAP City	Howrah District Hospital
4	Barrackpore	NCAP City	Dr. BN Bose Sub-Divisional Hospital
5	Chinsurah	Non-NCAP City	Imambara District Hospital
6	Asansol	NCAP City	Asansol District Hospital
7	Haldia	NCAP City	Haldia SDH
8	Durgapur	NCAP City	Durgapur SDH
9	Raniganj	NCAP City	Ballavpur Rural Hospital

Data on ARI is being captured daily in the Emergency Dept/ER and Medical Wards of the above-mentioned hospitals, being compiled, and reported at the end of the month for correlation of the disease data with the Air Quality Index.

Data on ARI are being recorded in the Emergency Dept./ER in Format A (Register for ER) on a daily basis. The Register is maintained by the Sr. OD or some other senior Medical Officers on duty in the Emergency Dept/ ER. Every Faculty/ MO/ SR/ PGT/ House-Staff/ Intern who works in the ED/ER, records the data in the provided format during the shift s/he worked for.

The MSVP/Superintendent of the Hospital has already identified a DEO/ Asst. Superintendent/ other suitable Staff who collects the daily data alongside daily total attendance in the E.R and notes it in his/her record.

Data are recorded in the Medical Wards in Format B (Register for IPD) similarly on a daily basis. A Register is maintained by the Sister-in-Charge in all the Wards of Medicine Dept, Paediatric. Medicine and CCU/ITU/RCU. The data is collected during the night census. The data person also collects date-wise data from each of the Wards & Special Units at the end of each month.

The daily data collected by the data person from the ER and the Wards/Special Units are collated by him in his compilation format (Format C) and then a monthly report in Format D is generated. The MSVP/ Superintendent sends the Monthly Report to PH & CD Branch of the Directorate.

Stakeholder Departments/Organizations

- Family Welfare Branch of H & FW Dept.
- Urban Development & Municipal Affairs
- Panchayat & Rural Development
- Department of Environment
- Pollution Control Board
- Transport Dept.
- Home Dept. (Police)

Planned Activities

- Sensitization of peripheral health care workers e.g. ANMs, ASHA, etc.
- Sensitization of Panchayat functionaries.
- Organization of public awareness sessions at the village level in tandem with the Village Health & Nutrition Days.
- Conduct of awareness generation programmes in High Schools involving the RBSK & School Health HR for the roll-out of this initiative.
- Standard materials for capacity building – Concise materials will be developed in English & Bengali for capacity building of Medical Officers & Health Care Workers.
- Hospital-based surveillance on ARI will be extended to cities under the National Clean Air Programme (apart from Kolkata & Howrah).

- Correlation of ARI surveillance data with Air Quality Index data as will be obtained from Pollution Control Board.
- Greening of Health Facilities – initiation will be done with a few District or Subdivision Level Hospitals.
- IEC activities will be extended further with the help of other related Govt. Departments.
- Replacement of traditional lighting with LED lights in major health facilities throughout the state, in a phased manner.

Alerts on AQI data, as shared by PCB/IMD from time to time, will be communicated to the concerned districts so that they may put the treating hospitals on alert.

ROLES AND RESPONSIBILITIES

In accordance with the action plan on air pollution and its impact on human health, the following roles and responsibilities have been identified to be implemented at the state, district, block as well as healthcare facility level-

	Responsibilities
SNO	• Finalization of IEC material and dissemination plan • Organize IEC campaigns at the state level on the observance of important environment-health days • Organize training sessions for district-level and surveillance nodal officer • Facilitate training of medical officers in clinical aspects of air pollution's health impact • Real-time air quality data dashboard in proposed cities • Monitor AQI levels in states especially in hotspots and NCAP cities • Ensure reporting from sentinel hospitals and DNO • Ensure necessary health facility preparedness • Review surveillance reporting and monthly report submission by DNO • Submit a report of activities • Review implementation of IEC and surveillance activities at all levels • Evaluate and update relevant sections of SAPCCHH with support from the State Task Force • Liaison with State Pollution Control Board for AQI alerts and its dissemination • Liaison with the Department of Environment for combined IEC

	campaigns and information sharing on health indicators for targeted air pollution reduction activities • Awareness and action plan input sharing with the local bodies of cities with high AQI • Create organizational support and strengthen the Environmental Health cell to implement NPCCHH vision, goal, and objectives • Organize sensitization workshops for other stakeholders and line departments • Organize seminars on Air Pollution and conferences to share knowledge and action under NPCCHH. • Collaborate with academic institute/s for support in updating SAPCCHH • Surveillance activity monitoring, vulnerability assessment, and applied research • Advocate for a reduction in source of air pollution
DNO	• Ensure IEC dissemination to the community level • Facilitate community-level IEC activities • Organize training for Block Health Officers, Medical Officers, and Sentinel hospital nodal officers with relevant training manuals • Organize training of vulnerable groups i.e. police officers, outdoor workers, women, and children • Organize IEC campaigns at the district level on the observance of important environment-health days • Collect and monitor AQI levels in states especially in hotspots and NCAP cities • Ensure daily reporting from Sentinel hospitals and compile the data • Analyze daily health data with AQI level to monitor trends and hotspots in health impacts • Submit analyzed monthly report to SNO, NPCCHH Headquarter, and other departments for necessary action • Submit a report of activities • Update DAPCCHH with support from District Task Force • Advocate for a reduction in source of air pollution
Surveillance hospital nodal officer	• Train hospital staff and clinicians responsible for daily reporting in case indentation and reporting flow • Compile daily reports for the health facility and submit it to DNO and NPCCHH, Headquarters
Block Health Officer	• Conduct community-level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshops and training for vulnerable groups
Medical Officer	• Conduct health facility-based IEC activities

	• Support community-level IEC activities • Be aware of AQI levels and the health impact of air pollution • Ensure necessary health facility preparedness in early diagnosis and management of cases

Chapter 7: Health Adaptation Plan for Heat-Related Illness

Introduction:

Climate change and consequently the heatwave is taking its toll across West Bengal. Regional Meteorological department capable enough to provide prior intimation regarding weather forecast in present-day high-tech facilities.
In West Bengal, the Sunderbans area has been hit hard by heatwaves in addition to Bankura, Birbhum, and Purulia district western part. The rise in temperature in the forest region is harmful for the flora and the fauna. One may experience rapid climate and associated changes in various eco-regions. It will affect wildlife in Sunderbans in South Bengal and Gorumara, Chapramari, Neora Valley,Buxa Forest in North Bengal.

Climate change is leading to an increase in average temperatures and an increased possibility of severe heat waves. A heatwave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season. Heat waves typically occur between March and June, and in some rare cases even extend till July. The extreme temperatures and resultant atmospheric conditions adversely affect people living in these regions as they cause physiological stress, and heat stroke, sometimes resulting in death.

The Indian Meteorological Department (IMD) has given the following criteria for Heat Waves:

- Heatwave need not be considered till the maximum temperature of a station reaches at least 40°C for plains and at least 30°C for hilly regions
- When the normal maximum temperature of a station is less than or equal to 40°C: Heat Wave Departure from normal is 5°C to 6°C; Severe Heat Wave Departure from normal is 7°C or more.
- When the normal maximum temperature of a station is more than 40°C: Heat Wave Departure from normal is 4°C to 5°C; Severe Heat Wave Departure from normal is 6°C or more.

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

Health Impacts of Heat Waves:

Heat stress can make working conditions unfavorable and increase the risk of cardiovascular, respiratory, and renal diseases and heat-related illnesses. With 1.5°C warming, 350 million more people could be exposed to deadly heat stress by 2050.

The health impacts of Heat Waves typically involve dehydration, heat cramps, heat exhaustion and/or heat stroke. The signs and symptoms are as follows:

- *Heat Cramps:* Edema (swelling) and Syncope (fainting) generally accompanied by fever below 39°C i.e.102°F.
- *Heat Exhaustion:* Fatigue, weakness, dizziness, headache, nausea, vomiting, muscle cramps, and sweating.
- *Heat Stroke:* Body temperatures of 40°C i.e. 104°F or more along with delirium, seizures, or coma. This is a potentially fatal condition.

Pathophysiology of Heat/ Extreme temperature impact:

The effects of heatwaves on human health are generally worse in urban areas, due to the "***Heat Island"*** effect. The heat island effect occurs when urban areas experience much higher temperatures than that of surrounding rural environments. This is caused by the extensive areas of treeless asphalt, along with many large heat-retaining buildings that physically block the cooling breeze.

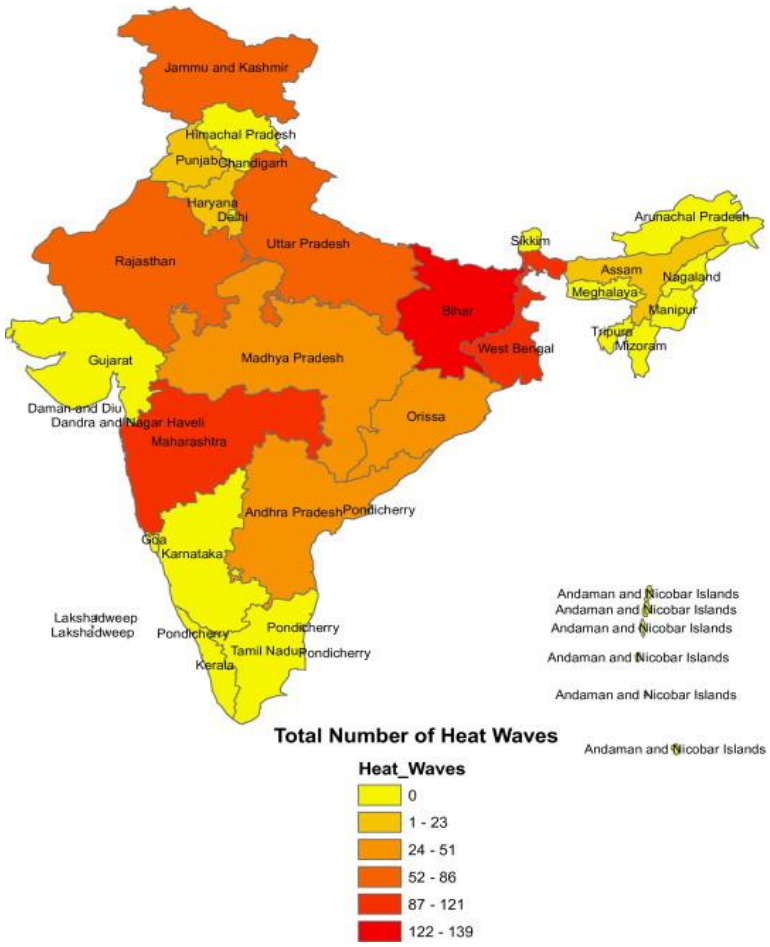
The human response to heat stress can be hyperthermia, heat stroke, and other harmful effects. Heat illness can relate to many organs and systems including the brain, heart, kidneys, liver, etc. Heat waves have also resulted in epidemics of chronic kidney disease (CKD). Studies have shown that prolonged heat exposure, physical exertion, and dehydration are sufficient factors for developing CKD. These cases are occurring across the world congruently with heat stress nephropathy.

A 2015 report revealed that the risk of dying from chronic lung disease during a heat wave was 1.8-8.2% higher compared to average summer temperatures. Bodily stress from the heat also causes fluid loss, which disrupts pulmonary perfusion. In combination with higher pollutant concentrations, this leads to bronchial inflammation.

The human body requires evaporative cooling to prevent overheating, even with a low activity level. With excessive ambient heat and humidity during the heatwaves, adequate evaporative cooling might be compromised. Even under ideal situation, sustained exposure to a wet-bulb temperature exceeding about 35 °C (95 °F) is fatal. As of 2020, only two weather stations had recorded 35 °C wet-bulb temperatures, and only very briefly, but the frequency and duration of these events is expected to rise with ongoing climate change. Elderly populations and those with co-morbidities are at a significantly increased health risk from increased heat.

Heat Vulnerability in West Bengal

The districts in the western part of the state are usually very hot in the summer months. These include Purulia, Birbhum, Bankura, Paschim Bardhaman, Jhargram, and Paschim Medinipur. A large area of this zone is characterized by laterite soil and is in continuity with the plateau of Jharkhand. Hence these districts are vulnerable to heat waves during the summer, when the ambient temperature may shoot up to 45-47◦ C. The summer season usually sets in this zone in April and continues till June. A significant proportion of the land surface is forest area, but the reduced forest cover adds to the heat swing during the summer. The scarcity of natural water resources and dysrhythmic biodiversity has enormous affects on the heat situation.



Why are Kolkata's temperatures rising? – The "Urban Heat Island Effect" in addition to greenhouse gases

Warming by "greenhouse gases" is a global phenomenon and, to that extent, contributes to the city's rising temperature. Yet, there is a second major reason afflicting cities worldwide called the "***urban heat island effect***". The heat island effect can cause temperatures in urban areas to be several degrees higher than the countryside due to high population densities, heat from vehicular exhaust and the use of ACs, dark roads made up of asphalt that absorb solar radiation, tall buildings that block wind flow and the lack of sufficient open green spaces.

Recent research led by Tom Matthews published in the journal PNAS (Proceedings of National Academy of Science of USA) found that humid heat waves of a devastating intensity of those in

2015 may strike Kolkata on an annual basis for a global average temperature rise of "as little as" 1.5 ^{0}C. These temperatures will be met in about 20 years at the current rate of warming.

Target population: Urban and highly dense or overcrowded spaces, people living in dry /drought-prone areas. Occupationally vulnerable groups including mine workers, laborers, field workers, traffic police, street children, etc. as well as the extremely aged group with co-morbidities.

Morbidity & Mortality in West Bengal

Currently, in the state, the cases of heat-related illnesses reported are not very high. However,. 57 cases and one death (Purulia) were reported from nine Districts in 2016. One death was reported also from Paschim Medinipur in 2015.

Actions taken

In accordance with the memo no. 596(11) –DMCD-11017(99)/61/2018 dated 28.03.18 of the Department of Disaster Management & Civil Defense, Government of West Bengal read with the letter from Director, NCDC, E. File No. 3146468/MOHFW dated 15.03.2018, measures are taken every year in the vulnerable Districts in order to minimize the morbidity/mortality due to heat exposure/stress.

(a) Guidelines on Prevention and Management of Heat-Related Illnesses issued by the MoHF&W are shared with all concerned. A soft copy is made available also on the departmental website (www.wbhealth.gov.in).

(b) An abridged version of the case management guideline has also been prepared, which is circulated, along with the case definitions, for the Medical Officers at all levels.

(c) A "Do-s and Don't-s" that has been formulated in Bengali is sent to all the CMOHs for circulation through the public health machinery for public awareness generation.

(d) Design of an IEC material has also been kept ready in the form of a leaflet (copy attached).

(e) At the onset of summer, the District Health Administration of the vulnerable Districts is alerted so that they maintain adequate stock of ORS & IV fluids in Sub-centres, Health Centres, & Hospitals.

(f) Advisory is sent to the bedded health facilities in the vulnerable Districts for the adoption of heat-focused examination procedures including arrangements for cool corners and cold drinking water.

(g) General Administration and ULBs are requested for the following:

- Large scale setting up of drinking water kiosks at common places.
- Re-scheduling of school timing to avoid peak heat during mid-day.
- Setting up of special shelters for MGNREGA workers and re-scheduling of their working hours.
- Wide publicity on Do-s & Don't-s and forecast of the heat wave (if any).

HEALTH ADAPTATION PLAN ON HEAT-RELATED ILLNESS

I. Awareness Generation

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

a. IEC Campaign

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, videos, organizing public health events, and issuing advisories related to increasing heat.

The content for the IEC for the heat-related issues will be provided by the 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 them at all levels.

TABLE 7.1: IEC dissemination plan

S. No	IEC Content	Priority Districts	Dissemination Plan	Timeline	Budget (in lakhs) for 5 years with 15% increase each year

					22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
1.	Posters	Purulia, Bankura, Bishnupur HD, Birbhum, Rampurhat HD, Paschim Medinipur & Jhargram (these 7 districts on priority) and subsequently all districts	1 Poster for Healthcare facilities in all districts	March to May	-	6.0	7.0	8.0	9.0
2.	Audio		Social Media (Facebook, Instagram etc.)	March to May					
3.	Videos								
4.	GIF's								
5.	Public Health Advisories		1 Health advisories to all the healthcare facilities	March to May					

b. Public Health Advisories

Health advisories are issued to alert the population of the potentially harmful impacts of increasing heat. Advisories are issued at the central level and forwarded to Districts through State/UTs for public dissemination. The districts should ensure timely dissemination of health advisories in locally acceptable language.

II. CAPACITY BUILDING

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

Training on various health impacts of heat is as follows

TABLE 7.2: NPCCHH TRAINING PLAN AT DISTRICT LEVEL

Training Programme	**Trainer**	**Participants**	**Training Content**
Medical Officers (3 Days)	DNO	MO (DH,CHC,PHC)	Heat-related illness
Community Health Care Workers (HWC) (2 Days)	MO	Community Health Workers (MPHW, ASHA)	
Panchayati Raj Institutions (1 Day)	MO, MLHP	Panchayati Raj Institutions, communities	

TABLE 7.3: SCHEDULE PLAN FOR TRAINING

S. No	**Training programme**	**Timeline**	**Target**	**Priority Districts**	**Budget (in lakhs) for 5 years**				
					22 to 23	**23 to 24**	**24 to 25**	**25 to 26**	**26 to 27**
01	DNO	February	100%	7 districts (Purulia, Bankura, Bishnupur HD, Birbhum, Rampurhat HD, Paschim	17.0	27.5	29.5	31.0	32.0
02	MO	March	100%						
03	Community Health Workers	April	100%						
04	Panchayati Raj Institutions	April - May	100%						

				Medinipur & Jhargram)					

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

Surveillance

Surveillance of heat is functional and the data is also regularly shared with National Center for Disease Control under the National Program of Climate Change and Human Health**.**
During the peak summer months, a daily report is collected from different health facilities of the vulnerable districts about cases and deaths (if any) due to heat-related illnesses in a specific format. The existing format will be partially modified in tune with the reporting structure suggested by NCDC, including 'nil' reporting as the case may be.

Additionally, the following efforts are being made-

a) Creating Heat Stress Response Corners in the Hospital. There will be a special section in the hospitals equipped with material, ORS, water, and drugs, along with the technical staff to create awareness and respond to heat-related emergencies.
b) Issuing Health advisories by the Directorate of Health and Family Welfare and District Collectors during extreme heat situations. These advisories will contain the Do's and Dont's for the general public.

Summary of Management of Heat-Related Illnesses

A. Onsite management.

The principles of onsite management are as follows.

• Removing the patient immediately to a cool shady place with enough ventilation.

• Making the patient lie down. Elevating the legs with support in case of heat cramps or exertion associate collapse.

• Assessing the body temperature.

• Removing excess clothing; drenching skin with cool water and fanning.

• Encouraging cold fluid intake - preferably with salt & sugar, if the patient is conscious.

• Transferring the patient to a suitable health facility.

B. **Management at health care facility.**

• Placing the patient in a cool &well-ventilated place (preferably AC room).

• Checking of airway, breathing & pulse if patient is unconscious.

• Recording of body temperature.

• Lowering of body temperature. Goal would be to rapidly reduce the core temperature to about 39◦ C but avoiding overshooting.

(i) External cooling by Immersion cooling, or Evaporative cooling.

(ii) Internal cooling.

- Intravenous rehydration: Staring with I.V. normal saline.
- Medication: Antipyretics (but not effective in heat stroke), anticonvulsant, correction of hypoglycemia (common in heat stroke) and others as & when necessary.
- Emergency life support
- Oxygen - Ventilation may be necessary. Avoid suxamethonium during intubation.
- Circulatory support

Differential diagnosis.

As example, exclusion of metabolic, cardiovascular & neurological causes of syncope in case of heat syncope/ ECG, serum sodium estimation etc. to exclude other causes in exertion associated collapse.

Monitoring and management of complications.

In heat stroke, temperature should be assessed with rectal or esophageal thermometer.

NB: For details of the classification and management protocol of Heat-Related Illnesses, please refer to the **"Guidelines on Prevention and Management of Heat-Related Illnesses, 2015"** issued by Emergency Medical Relief, Ministry of Health & FW, GOI **(available in IDSP Section of www.wbhealth.gov.in)**

Roles of stakeholders:

1. **At the level of Individual and House hold**

   a) Training and orientation of the frontline/health worker (ASHA/ICDS)
   b) Assessment of target group of people by household survey
   c) Timely intervention by higher authority/administrative authority regarding awareness generation, environmental modification by minimal intervention at their accessible limit.
   d) Active involvement of PRI (Panchayati Raj Institute) members and trained public representative for action taking and cooperation.

2. **At the level of small-scale establishment**
   a) Identification of high-risk target population/group/establishment/zone to intervene strategies
   b) Awareness/environment friendly construction planning, shading, tree plantation, water reservoir, climate friendly roof and construction
   c) Emergency service regarding heat wave impact related health problems
   d) Reporting cell and rapid response team with well communication networking with higher level and referral
   e) White painting of roof of buildings to reduce heat absorption. For hospitals, this measure may be incorporated in Green Health Facility schemes.

3. **At the Community/District level**

   In addition to item no 1 & 2,

a) A response or supporting team at community health/block level to be established for timely back up of lower tier services
b) Training centre, database, reporting portal establishment and financial back up to provide essential services
c) Intersectoral coordination: Establishing and identify roles and responsibilities of operational district level bodies relevant to climate change and their constitution, such as Distt. Disaster Management Authority, Disease Surveillance Programmes, Distt. Health Information System, district unit of Departments of Meteorology, Pollution Control Board, Water and Sanitation, Public Works Departments and civil societies etc.
d) Involvement of Private agencies by PPP model or NGOs/NPOs.

4. At Higher Tier/ State level

a) Advocacy of the State level task force members along with training of the trainer to be completed immediately. Capacity Building by training cum orientation workshop for health care professionals towards managing Heat-Related Illnesses. The training aimed towards orienting healthcare professionals on Heat Stress Action Plan, enhancing their capacities for proper and inclusive management of heat-related illnesses and health impacts.

b) A **State Research Wing cum Training Cell** to be established, preferably in a well-developed Medical College for:
    i. Time to time research and analysis in collaboration with Dept of Meteorology, IT sector and state epidemiology cell for observational and operational studies.
    ii. Training in frequent intervals with provision of both offline and online mode.
    iii. Supervision and monitoring of strategies implemented.

c) Strengthening of HMIS in the existing reporting portal.
d) Periodic meetings with other departments for review of planning, policy making and modification.
e) Financial implementation/budgeting in both recurring and non-recurring expenditure under separate HOA along with untied fund facilities to combat emergency situation.

5. At Inter sectoral and Stakeholder level

a. Encouragement for more contribution under CSR scheme focusing on environmental domain category.
b. Volunteering scheme from NGOs/NPOs to be encouraged to face or mitigate crisis situation
c. Urban Development Corporation, ULB, and all the Development authorities including HIDCO to be involved in environment/climate-friendly planning of city and town ship
d. Mass media including Doordarshan, Pvt news media, local TV channels, re-vamping of Gyan darshan channel to be actively involve for mass education
e. Organizing Essay, Seat and draw, extempore competition along with Remuneration and/or Grant for individual and small scale start up establishment on behalf of society /community to integrate public awareness at each and every corner of the society.

6. At all levels:

- Reorientation of Hospital Superintendents, BMOH, Medical Officers, Nursing Personnel and other supportive non-medical administrators.
- Key leadership and commitment at local government set up.
- Stock taking of heat focused examination procedures including arrangement for cool corners and cold drinking water in the hospitals (in vulnerable Districts) and consolidation of the action taken in this regard.

- Exchange of heat wave alerts from Meteorology Dept. and percolation to District &Block levels.
- Further extension of awareness among the public as well as Depts. related with engagement of physical workers/labour.
- Focus on doable action at local/City level
- Good prediction system for weather forecasting for 7 days in advance to mobilize the affected population at rescue centre as well as to prepare to combat the situation as per given training.
- Capacity building at the community level, through awareness campaigns and outreach programmes. Communicating risks associated with heat stress and its impact on health, livelihood and productivity and ways to mitigate the same.
- Initiating research on micro-climate and corroborating the need to monitor temperatures in urban areas. Policy level intervention to retrieve natural eco-systems and natural shelters.
- Improvising the urban landscapes through vertical greenery, roof gardens can prove to be good alternate methods to bring down the temperature of the built environment.
- Greening infrastructure can be an effective method to cope with heat stress. Urban forests have found to be effective for city heat mitigation.
- A combination of shading, reduced heat build-up in materials, humidity and wind management can provide heat refuge at street levels.
- Initiating Early warning systems, advisories and alerts against extreme heat for the communities and Urban Local Bodies.
- Building communication networks through Local bodies, Health officers, Health care centers, hospitals, communities and media.
- Encourage investing in water bodies, fountains in areas of mass presence and promote greeneries in urban areas along with improving green transport and energy systems.

Mitigation:

Steps to be taken to reduce heat stress during a heatwave (during-event responsibilities) and measures to incorporate lessons learned and fill gaps found in the management of heat stress (post-event responsibilities) are as following;

During the Heat Season (April to June) High alert, continuous monitoring of the situation, coordination with all the department's agencies concerned on one hand and general public and media.

Post -Heat Season (July to October) main attention on evaluation and updating of the plan. It is important at the end of the summer to evaluate whether the heat-health action plan has worked. Continuous rectification of the plan is a necessity. Global climate change is projected to further increase the frequency, intensity, and duration of heatwaves and attributable deaths. Public health preventive measures need to take into consideration the additional threat from climate change and be adjusted over time.

Heat wave alerts are issued from time to time by IMD. Dissemination of such alerts to the district level will be a valuable input for the DNO-CC.

On one hand, he will be able to alert the emergency health service to gear up for tackling heat related illness cases.

On the other hand, he may further disseminate the message to alert the public. This can be done through the Genl. Administration, PRI, existing public address systems and different WhatsApp groups.

Mitigation measures

- Keeping gardens, cooling shelters and other possible cooling centers open with the availability of drinking water.
- Availability of water and sheds at open construction sites.
- Distribution of gunny bags for putting on the tin roofs/asbestos in slums. (Trial in Rajkot is going on).
- Provision of water points (Jalsatra) and ORS at construction sites, bus stands, and other public places during processions and political and other rallies and processions during summer.

- Distribution of cool roof jackets to on-duty traffic police personnel.
- Water tanker campaign- Tankers to be made available on call in slums during alert days.
- ***Early warning communication-*** SMS and WhatsApp messages for early warning to citizens, NGOs, Citizen welfare groups, and construction contractors.
- Public address through mikes a day before and early on the forecasted day.Press Releases and campaigns on radio, TV, and websites.
- Medical camps at hotspots.
- ***Monitoring and Analysis-*** Recording ward-wise heatstroke cases, proper cause of death, and monitoring daily mortality as well as daily hospital admission due to all causes and due to heat-related causes.
- Identifying locations for building shelters and shades in urban areas. Shelter locations for the urban poor and slum dwellers must be identified and constructed.
- Incorporation and documentation of indigenous knowledge to develop protective measures at the regional and community level for sensitization and awareness generation. Local culture and physical exposure of the population need to be improvised to reduce the impact of heat stress on health and physical wellbeing.

Stakeholder Departments to be involved:

- Panchayat & Rural Development
- School Health Education-secondary as well higher secondary.
- Information & Cultural Affairs
- Meteorology Dept. (GOI)
- Public Works Dept.
- Railways and transport.
- State-run Development Authority
- HIDCO etc.
- Disaster and Civil Defense Department

Roles and responsibilities

- The roles and responsibilities of the state staff to implement the action plan for heat-related illnesses are defined below-

	Responsibilities
SNO	• Disseminate early warnings to the district level • Finalization of IEC material and dissemination plan • Liaison with IMD for weather alerts and its dissemination • Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action • Organize the IEC campaigns at the state level on observance of important environment-health days • Organize training sessions for the district level and the surveillance nodal officers • Facilitate training of medical officers in clinical aspects of the heat-health impact • Ensure daily surveillance reporting from the district level • Ensure submission and analysis of heat-related death at the state and district level • Monitor daily health data with temperature and humidity levels to monitor trends and hotspots in the state • Review health facility preparedness and ambulance services to manage HRI • Identify health facilities at different levels that can have heat illness wards with necessary treatment/cooling facilities • Keep existing Rapid Response Teams under IDSP prepared to manage HRI if needed for an emergency response to extreme heat • Review implementation of the IEC and surveillance activities at all levels • Evaluate and update relevant section of SAPCCHH with support from State Task Force • Create organizational support and strengthen Environmental Health cell to implement NPCCHH vision, goal, and objectives • Organize sensitization workshops for other stakeholders and line departments • Organize seminars and conferences to share knowledge and action under NPCCHH. • Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, training of health care professionals, vulnerability assessment, and applied research • Submit a report of activities on heat-health under NPCCHH • Advocate for the reduction in source of greenhouse gas emissions

DNO	• Disseminate early warning to block and health facility level • Ensure IEC dissemination to the community level and facilitate community-level IEC activities • Liaison with IMD to receive daily observed temperature and relative humidity information • Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action • Conduct training for block health officers, and medical officers with relevant training manuals • Conduct sensitization of vulnerable groups: police officers, outdoor workers, women, children, etc • Organize IEC campaigns at the district level on the observance of important environment-health days • Ensure daily reporting from health facilities and compile the data • Analyze daily health data with temperature and humidity levels to monitor trends and hotspots in the district • Support timely suspected heatstroke death analysis and its reporting • Submit analyzed weekly report to SNO, NPCCHH, Hq, and other departments for necessary action • Coordinate with other agencies for response • Update DAPCCHH with support from District Task Force • Submit a report of activities on heat-health under NPCCHH • Advocate for the reduction in source of greenhouse gas emissions
Block health officer	• Conduct community-level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshops and training for vulnerable groups • Implement heat mitigation efforts
City health department	• Support in the development and implementation of the city-specific heat-health action plan
Medical officer	• Conduct health facility-based IEC activities • Support community-level IEC activities • Ensure necessary health facility preparedness in early diagnosis and management of cases
Panchayati Raj Institutions	• Conduct community-level IEC activities

Chapter 8: Health Adaptation Plan for Vector-Borne Diseases

The menace of different Vector Borne Diseases (VBD) in the state of West Bengal, namely Dengue and Malaria, is a considerable public health burden and twined significantly with the climate changes. Especially the case load of dengue is often very high posing a serious public health threat. The changing pathology of the disease with the involvement of multiple organs, and the more exophilic nature of the predominant vector (Aedes albopictus) alongside different circulating serotype of the virus are areas of concern. A multi-pronged approach has been adopted from time to time to tackle the problem holistically.

The case fatality rate has shown a steady decreasing trend from 2017 till 2019. But the point of concern is the increasing incidence of dengue in rural areas, probably due to unplanned urbanization, climate change, change in vector characteristics, etc.

Preparedness & actions taken

The following measures have been adopted to control dengue in the state:

Measures for Prevention & Control of Dengue in West Bengal			
S. No	**Measures**	**Activities**	**Status**
1	Entomological Surveillance & Vector control	Pre-monsoon activities for perennial breeding sites	The status of some sample perennial breeding sites in the pre-monsoon season was noted. The plan was to compare the status after the implementation of the vector control activities.
		Entomological surveillance activities with monitoring of relevant indices at fixed and random sites at regular interval	Surveillance is done in more than 200 sites every fortnightly
		Breeding Container Analysis	Types of breeding containers (other than HI, BI, CI) are analyzed and specific vector control activities are recommended to strengthen vector control activities.
		Intensification of vector control activities in areas reporting high indices for Aedes	Weekly alert is generated on the basis of analysis of the entomological surveillance

		Source reduction activities during house-to-house survey except in Covid-19 containment zones adhering to respective guidelines	Vector Control Team Members are sensitized to emphasize the source reduction activities.
		Guppy fish have been released in both Urban and Rural areas	Guppy fishes have been released in the waterbodies like ponds, lowlands having stagnant water accumulation, clogged drains, etc.
		Fogging in the containment zones	
2	Disease surveillance	Test for suspected Dengue cases at SSHs	
		Stock of diagnostic kits (ELISA based NS1 & IgM)	
		Timely reporting from SSHs even for tagged peripheral institutes with line-listing	Being uploaded in DKPI portal regularly
		Rapid response team for any upsurge/outbreak	Already in vogue at the state, district & block/municipality level
3	Case Management	Dedicated beds for Dengue patients in hospitals	Present & strategically placed
		Sufficient stock of blood components in blood banks	
		Provision of timely referral from the periphery	Available
		Dengue case management protocol of State	Present & being followed
		TOT of the Dengue case management protocol in 2020	State TOT completed. District and sub-district level training in progress
		Training on management of Dengue cases with co-morbidities and in special groups	Addressed elaborately in this year's modified Dengue case management protocol
		Use of Top-sheet to monitor the clinical condition of the patient	Used everywhere for suspected and confirmed Dengue cases
4	Logistics	Stock position of insecticides	Temephos, Bti 5%WP (Strain 164), Serotype H-14 &Bti 5%WP (Strain ABIL), Serotype H-14 have been supplied to the urban and rural areas via District CMOH Office.
		Other logistic issues for vector control	Chemical larvicides are sprayed in 9 weeks with 1 week of Biolarvicide to prevent the development of insecticide resistance.

		Cell counter machine	Dispatched newly to a number of institutions
		ELISA machine for Dengue diagnostics	Dispatched newly to a number of institutions
		Component separation unit for blood bank	
		Fund allotment for different logistics in different critical care units	
		Purchase of portable USG machine for Dengue case management	
5	IEC for community awareness	Regular rounds of house to house survey for IPC to encourage community awareness and involvement in source reduction	Being done (except in COVID 19 containment zones adhering to respective guidelines)
		Use of electronic media	TV & radio are regularly used
		Use of social media	
		Public display of banners, posters, etc	Done in hospitals, offices, roadsides, market places etc.
		Mobile app for fever reporting and probable breeding source identification	
6	Inter-sectoral co-ordination	State level coordination with SUDA, Municipal Corporations, P&RD	Training for vector control activities, awareness generation, case management imparted; regular liaison being maintained
7	Monitoring	Daily reporting of fever cases	Being done from every institution through DKPI portal and analysis carried out in DSU & SSU on a regular basis
		Reporting of laboratory confirmed Dengue cases	Being done by both the govt. and pvt. hospitals and laboratories through DKPI portal daily and through IDSP
		Entomological reporting	Provision for real-time reporting of survey findings has been arranged through google spread-sheet
		Monitoring of laboratory activities & adherence to protocol based management	State & district level monitoring teams provide supportive supervision to different private and government institutions regularly
8	Miscellaneous	Engagement of phlebotomist in selected high case load hospitals for stipulated time	In process

		Establishment of district level entomological laboratory	Functional in 15 districts (rest 12 districts under process); funds to buy basic equipment have been released. Entomological laboratory in the State HQ is also under process

Further strategy & plan

- Vector Mapping – To determine the distribution and formation of a database of different vector species densities over time.
- Functional Entomological Laboratories at State & District Levels
- Monitoring of resistance of vectors against larvicides and insecticides.
- Emphasis on solid & liquid waste management in urban as well as rural areas, which will encompass tackling malaria, leptospirosis, diarrhoeal diseases, etc., in addition to dengue.
- Extension of dengue diagnostic facilities to all the 2nd tier hospitals (SDH/ SGH/ SSH-s) and to the specifically vulnerable blocks.
- Empowering the Block PHCs of the high-risk Blocks with cell counters, typhoid antibody kits (rapid test) etc. for investigation of fever cases.
- Totally portal-based line listing of cases to enable epidemiological analysis.
- To engage with Meteorological Dept. to have mid-long term rain forecast as an alert for dengue upsurge.

Stakeholder Departments

In order to address the climate-sensitive aspect of the Dengue problem, coordination and convergence would be necessary with the following Departments of the State & Central Govt.

- Urban Development & Municipal Affairs
- Panchayat & Rural Development
- Public Works Department
- Public Health Engineering
- Irrigation & Waterways
- Education
- Fisheries
- Meteorology

Malaria

Malaria is a highly climate-sensitive disease. Malaria is targeted to be eliminated from the country by 2030 and accordingly, the Control Programme has been renamed as Malaria Elimination Programme. The target is to have zero indigenous cases in any of the States & UT-s. West Bengal is in Category II of the States i.e. where the Annual Parasite Incidence (API) is < 1 for the whole State but is > 1 in one or more of the Districts.

Vulnerability:

All the Districts of West Bengal are endemic for malaria due to the tropical climate, fairly high rainfall, high humidity through a majority of the months of the year (summer, monsoon & post-monsoon seasons), etc. The ecology characterized by innumerable water bodies and plenty of canals, ditches & rivulets adds to the factors influencing the vulnerability. Paddy culture, unplanned urbanization, migration of laborers, etc. are also contributing factors.

The Districts that were traditionally known as high endemic Districts have gone down in the scale of endemicity in the last several years. Use of LLIN (long lasting insecticide treated net) and early case detection with Rapid Diagnostic Kit are believed to have made this possible. However, malaria incidence has increased in several other Districts over the last few years.

Different species of Anopheles vector, e.g. An. stephensi, An. culicifacies, An. annularis, An. fluviatilis etc. are predominant in different parts of the State. It is very difficult to control breeding of Anopheles in rural environments, since breeding places like paddy fields, canals, slow-moving streams, etc. are not easily amenable to source reduction. Control of adult vectors with insecticides is also getting less effective due to vector resistance.

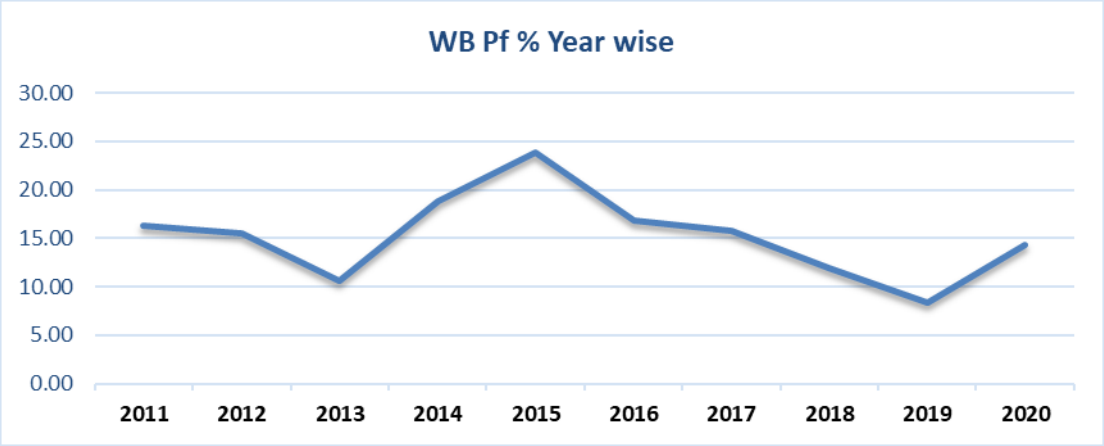
Morbidity & mortality:

The rise and fall of overall malaria cases & deaths in the State have occurred in the following manner.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Malaria cases	66308	55753	34717	26484	24909	35204	31175	26440	25928	14057
Malaria death	19	30	16	65	34	59	28	8	6	5

There were fluctuations in the incidence of malaria over the years. However, deaths due to malaria have markedly decreased since 2018. The gross decrease in no. of cases in 2020 seems to be mostly owing to the unusual situation arising from the COVID pandemic.

The proportion of falciparum (Pf%) among the total malaria cases also had gross fluctuations during the last decade (see graph below).



However, API would depend on Annual Blood Examination Rate. Hence it would be better to look at the Test Positivity Rate (TPR).

The overall TPR (%) for the State significantly declined in 2017 & 2018 and then remained more or less stable at around 0.22%. However, there was wide variation among the districts. The TPR remained very high (>4%) in Kolkata all through the last five years (2016-2020). The TPR of previously known high endemic districts, viz.- Bankura, Jalpaiguri, Paschim Medinipur & Purulia have noticeably decreased in recent years. Several other Districts e.g. Howrah, Malda, Murshidabad, South 24 Parganas, etc. have been showing a relatively higher TPR with respect to other districts during the last 3 years.

It needs to be kept in mind that disease endemicity may have variance within a district. Even in a low endemic district, there may be a few subcentres where the incidence is significantly high. From this viewpoint, subcentre-wise API is discussed in the next section.

Categorization for elimination:

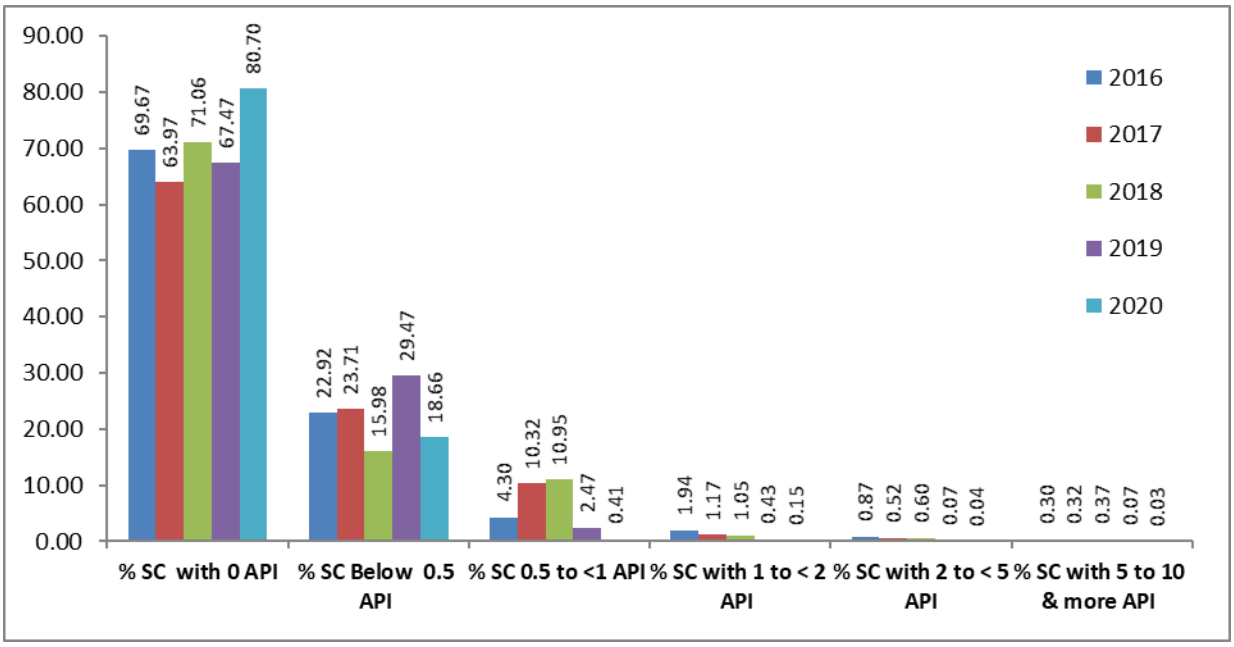
The aim of National Malaria Elimination Programme is to reach Category 0 i.e. when there will be no indigenous case of malaria in any part of the country. The target year is 2030.

Districts and Blocks are categorized as per Programme criteria. The purpose is to take strategic actions and strengthen activities according to the stratification.

All Districts of West Bengal except Kolkata are in Category I, since the overall API (Annual Parasite Incidence) of the District is below 1 and also API of all the Blocks within the District is < 1. In Kolkata, although the overall API is < 1, certain Boroughs have API > 1. Hence Kolkata falls in Category II.

API is monitored up to the Subcentre level in accordance with the Programme guideline.

The same has been shown graphically hereunder.



Measures taken:

S. No.	Measures	Action	Status
1	Diagnosis	Microscopy- standard diagnostic method. Rapid Diagnostic Kit (RDK)- for quick detection	Microscopy available up to all Block PHCs and some of the PHCs. Community health workers can also avail of it by sending slides to the

			PHC lab. RDK available up to Sub Centre level and also with the ASHAs in high endemic areas.
2	Case management	Management of uncomplicated & severe cases of vivax and falciparum – as per the (National) Drug Policy Malaria	Tablets of chloroquine and Artesunate-SP available at all levels up to the Subcenters. Inj. Artesunate ensured in all hospitals up to the Bedded PHC-s.
3	Surveillance	Early detection to enable prompt treatment to cut the transmission chain. Malaria needs to be excluded in fever cases as per the National Treatment Policy.	Evaluation of fever cases with RDK at Subcentre level. Also, collection of blood slides by community level workers. Testing for malaria (RDK & microscopy) monitored against a population-based target.
		Fever surveillance through field workers to identify cluster of cases (if any). Mapping of malaria cases to identify focal outbreaks.	Fever surveillance data collected from all Subcentres and analysed weekly. Mass survey and focal IRS to contain outbreaks.
		Capturing information of cases detected in private laboratories. (Significant contribution of private sector, inefficiently covered through the routine paper-	Development of an on-line portal for case notification by private laboratories

		based reporting system).	
4	Entomological surveillance	Identification of entomological sentinel sites in selective Districts. Monthly survey at these sites.	Survey performed by District Entomological Team to identify vector species and to monitor vector density.
5	Vector control	Indoor Residual Spray (IRS) in endemic Subcentres – two rounds in a year. Also, focal spray in areas of case clustering and around malaria deaths.	Identification of endemic Subcentres on the basis of data of previous 3 years. IRS with 50% DDT.
		Checking of potential breeding sites for presence of mosquito larvae.	Breed checking done by trained grass root workers. Source reduction and larvicidal spray(Temephos and Bti)done by Vector Control Teams.
		Use of larvivorous fish for biological control	Guppy fish released in waterbodies like cesspool, blocked drains, unused ponds etc. in pre-monsoon season
6	Personal protection	Distribution of LLIN (long lasting insecticidal net) in endemic Subcentres.	Villages under Subcentre having API > 1 are covered.
7	IEC	Blood test for early detection of malaria and use of mosquito net are publicized	Publicity through print materials e.g. posters, banners etc. and interpersonal communication. Observance of Anti-Malaria Month in June every year.

Further strategies:

- Identification of the highly endemic subcentres/urban wards across the state, irrespective of the endemicity of the districts.
- Strong vigilance to recognize any fever/malaria cluster at the earliest opportunity so that prompt containment measures can be taken.
- Line listing of each and every malaria case to support vigilance. Portal based listing would be preferable.
- Active surveillance by properly utilizing the grass root manpower like ASHA, HHW, etc.
- Commensurate availability of logistics to support continuous active surveillance.
- Training & re-training of Laboratory Technicians to keep up their skill and motivation in quality microscopy even when the disease becomes infrequent in the community.
- Unbarred use of Rapid Diagnostic Kits in the peripheral units where microscopy results cannot be available within 24 hours.
- Training and re-training of doctors and nurses to enable them to identify severe malaria in time and manage cases as per protocol so as to avert any death.
- Monitoring & research on the emergence of drug resistance.
- Orientation of Informal Health Care Providers to strengthen surveillance and case notification.
- Entomological surveillance to locate high vector density areas so that more intensive & pre-emptive actions can be taken.
- Mapping of malaria vectors in the Districts of higher endemicity and monitoring the changes in profile over the years.
- Sustenance of the LLIN distribution activity along with monitoring of its proper use.
- Operational research may be undertaken for newer developments in biological control.
- Vigilance on migrants and strengthening of cross-notification.

- Special sub-plans for typical risk groups like footpath dwellers, nomads, isolated forest villages, etc.

Stakeholders to be engaged:

- Dept. of Urban Development & Municipal Affairs
- Dept. of Panchayat & Rural Development
- Dept. of Fisheries
- Dept. of Agriculture
- Forest Dept.
- Dept. of Education
- Other Govt. agencies providing health care services e.g. Railways, ESI, Defence, etc.
- National institutes performing entomological research

Scrub Typhus

Scrub typhus, also known as bush typhus, is a disease caused by a bacterium called *Orientiatsu tsugamushi*. *O. tsutsugamushi* is transmitted by trombiculid mite larvae (chiggers), which feed on forest and rural rodents, including rats, voles, and field mice. Human infection also follows a chigger bite. The mites are both the vector and the natural reservoir for *O. tsutsugamushi*. The most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash. In the last few years in West Bengal, it is established itself as an emerging threat to public health which needs to be monitored.

Vulnerability:

Trombiculid mites are most prevalent in the hot regions of the globe. Even in the cold countries, it is found more in the temperate zones. West Bengal being located in the tropical region, bears a

huge population of these mites. The sprawling areas of agricultural land and the associated population of rodents favors the multiplication of the mites. In many urban communities, uncleanliness is suitable for the habitation of rodents which again invites the abundance of mites.

The Terai region in the north has many tea gardens which are said to be very suitable places for the trombiculid mites. The culture of walking barefoot also predisposes people to mite bites.

The collaborative study of AES pathogens with NIMHANS (2016-2018) showed that scrub typhus is the causative agent for about 34% of the acute encephalitis cases in the State, surpassing by far the Japanese encephalitis virus which was earlier considered to be a principal agent for AES.

Morbidity:

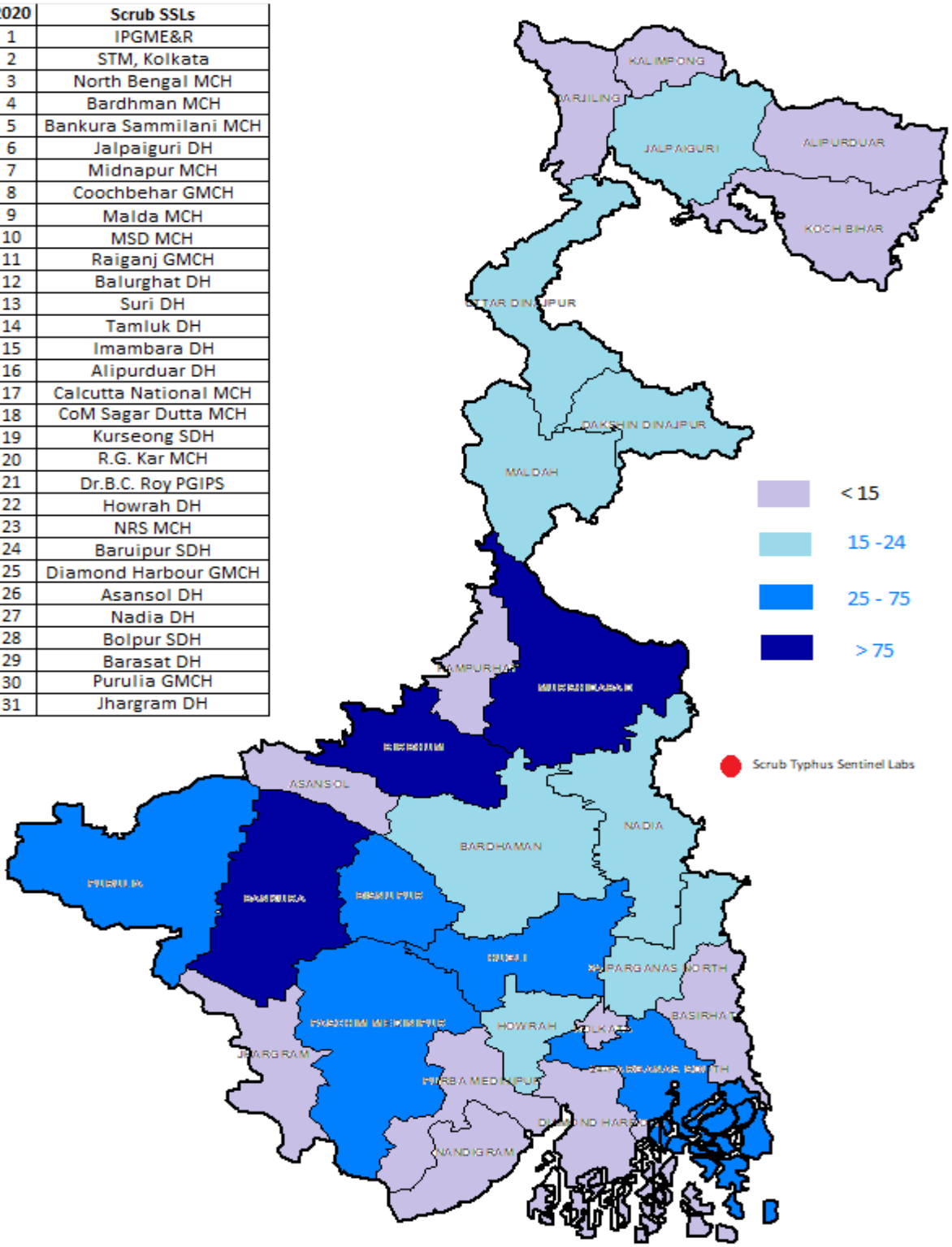
The table below illustrates the Scrub scenario in state:

Scrub Typhus Cases for the year 2018 to 2021 (till 29.06.2021)

Year	Total tests done	Lab confirmed cases	Positivity rate (%)
2018	3796	579	15.3
2019	12971	3148	24.3
2020	11262	1244	11.1
2021 till 29th June	4090	345	8.4

Scrub Typhus Map for 2020

2020	Scrub SSLs
1	IPGME&R
2	STM, Kolkata
3	North Bengal MCH
4	Bardhman MCH
5	Bankura Sammilani MCH
6	Jalpaiguri DH
7	Midnapur MCH
8	Coochbehar GMCH
9	Malda MCH
10	MSD MCH
11	Raiganj GMCH
12	Balurghat DH
13	Suri DH
14	Tamluk DH
15	Imambara DH
16	Alipurduar DH
17	Calcutta National MCH
18	CoM Sagar Dutta MCH
19	Kurseong SDH
20	R.G. Kar MCH
21	Dr.B.C. Roy PGIPS
22	Howrah DH
23	NRS MCH
24	Baruipur SDH
25	Diamond Harbour GMCH
26	Asansol DH
27	Nadia DH
28	Bolpur SDH
29	Barasat DH
30	Purulia GMCH
31	Jhargram DH



Measures for Prevention & Control of Scrub in West Bengal

Serial No	Measures	Activities
1	Disease surveillance	Steady increase in the number of diagnostic labs over the last few years: In 2019- 19 labs In 2020- 31 labs In 2021- 39 labs. IgM ELISA has been stipulated as the diagnostic test. Districts have been tagged with particular laboratories for convenience of sample referral.
2	Case Management	A protocol for the management of scrub typhus has been issued on 03.12.2019 and widely circulated. Specific criteria have been laid down for the selection of cases for testing and circulated along with the management protocol.
3	Logistics	Adequate stock of doxycycline or azithromycin is available in the hospitals and MO-s have been made aware of the role of these antibiotics.
4	Monitoring	At the state level, regular monitoring of kit utilization and providing funds/kit whenever required, for uninterrupted testing. Weekly report compilation and alert generation is done on an SOS basis. The State Rapid Response Team monitors the disease situation and the measures taken.

Further strategy:

- To keep all the units in the laboratory network active throughout the year and to ensure regular flow of samples to those labs, so that representative data are generated for all the parts of the State.
- To strengthen the surveillance system in order to capture mortality data of scrub typhus from the major hospitals.
- To arrange a small study to determine the cut-off OD-value for IgM ELISA positivity with reference to the local population. [Till now we have been following the cut-off value practiced by NIMHANS].
- To undertake entomological surveys in areas reporting high no. of cases.

- To emphasize IEC for prevention of scrub typhus. Departments like Women & Child Development, School Education etc. need to be involved.

Stake holder Departments

In order to address the issues of rodent reduction, water stagnation and public awareness about scrub typhus, coordination would be necessary with the following Govt. Departments.

- Urban Development & Municipal Affairs
- Panchayat & Rural Development
- Public Works Department
- Public Health Engineering
- Education
- Women & Child Development

HEALTH ADAPTATION PLAN ON VECTOR-BORNE DISEASES

IEC Campaign

- 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, videos, organizing public health events, and issuing advisories related to vector-borne disease.
- 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, hoardings, billboards, and other advertisement modes

Capacity Building:

Refresher training of the Medical professionals:

- Expanded training of doctors and associate staff
- Increased training of NGOs and Asha workers

NPCCHH TRAINING PLAN AT DISTRICT LEVEL

Training Programme	*Trainer*	*Participants*	*Training Content*
Medical Officers (3 Days)	*DNO*	*MO (DH, CHC, PHC)*	*Vector borne related illness*
Community Health Care Workers (HWC) (2 Days)	*MO*	*Community Health Workers (MPHW, ASHA)*	
Panchayati Raj Institutions (1 Day)	*MO, MLHP*	*Panchayati Raj Institutions, communities*	

Sensitization/knowledge building workshops should be planned for seeking updates on various vector-borne diseases between district officials, medical officers, and academic institutions working on climate change impact.

Surveillance:

a) Monitoring of the cases in the districts through collaborated affords with IDSP/Vector-borne disease programs and district Nodal Officers of NPCCHH
b) Monitoring and evaluation

- Monthly Computerized Management Information System (CMIS)
- Field visits by state by State National Program Officers
- Field visits by Malaria Research Centers and other ICMR Institutes
- Feedback to states on field observations for correction actions.

Chapter 9: Health Adaptation Plan for Extreme Weather Events and Disaster Management

The state of West Bengal lies in between the Himalayas and the Bay of Bengal and its location falls on the path of the south-west monsoon, making the **state particularly prone to floods and cyclones**. Heavy precipitation during the rainy season coupled with widespread silting in the river beds and dams causes frequent floods in this region. Heavy rainfall at the upstream of the Gangetic River system and the Damodar also causes spate at the downstream and in the subsidiary rivers.

Vulnerability:

The north Bengal Districts of Jalpaiguri, Alipurduar, and Coochbehar that fall in the Dooars region are affected by rivers going into spate due to heavy showers in the hills. The districts on the western side of the state e.g. Bankura, Paschim Bardhaman, Purba Bardhaman, Birbhum, etc. are affected by heavy rainfall at the upstream of the Damodar Valley. Districts like Malda, Murshidabad, Nadia, Purba Bardhaman, etc. through which the Ganges/ Hooghly River flows, witness floods due to the overflowing of Hooghly or its tributaries. The coastal districts of the state are vulnerable to breach in the embankment and resultant inundation at the time of high tides. The coastal districts and the districts next to them are also vulnerable to cyclones originating in the Bay of Bengal. The receding mangrove belt of the Sunderbans (that is supposed to protect the coast) adds to the impact in the inland.

Existing efforts of climate change mitigation:

(a) Convergence meetings: The flood/cyclone preparedness and mitigation activities are led by the Dept. of Disaster Management in the State. However, the Dept. of Health & FW prepares its own plan of action. Every year a State Level Inter-Departmental Convergence Meeting is taken by the Chief Secretary before the monsoon sets in. Prior to that, usually in the month of May, Health organizes its annual review meeting on flood/cyclone preparedness wherein all the District CMOHs and the heads of the concerned branches are invited.

(b) State & District Plans: A basic flood/cyclone preparedness plan is there at the state level and also in the vulnerable districts. The plans are updated and modified with the inputs collected in the review meeting (mentioned above). The plans identify the vulnerable areas and health facilities and provide a directory of the persons to be contacted for coordinated actions.

(c) State guidelines: A module was developed for the training of Medical Officers on the management of disasters. The same document is considered as the state guidelines which cover all the common natural calamities with a special focus on floods and cyclones. Also, there is a drug schedule that serves as a reference for logistics management. It gives the names of medicine which are required to mitigate a flood situation and also specifies the estimated quantity that would be needed to cater to a population of 10,000 for one week.

(d) Preparedness: Since monsoon is the commonest season for floods and cyclones, adequate stock of relevant items e.g. ORS, inj. AVS, bleaching powder, etc. are procured by the District health authorities. In case there are specific zones in the district that are prone to be cut off during floods, a reserve stock is placed beforehand at a suitable place within the zone. During disasters, a serious issue for health facilities is the sustenance of the power system. Hence, when there is a forecast of a major cyclone, alternative power back-ups are kept ready with particular care for vaccines, blood, and blood products.

(e) Control Room: Whenever a widespread incident of flood or cyclone occurs, a Control Room is opened at the State level in consultation with the State Health Authorities. Control Rooms are opened also in the concerned blocks and districts from where the combat activities and logistics management are monitored and coordinated. At the state level, Asst. Director of Health Services is in charge of the mitigation of disasters/ natural calamities.

(f) Daily reporting: Daily reports, as and when necessary, are generated in a prescribed MS Excel-based format, transmitted electronically from the affected districts to the PH & CD Branch of the State Health Directorate, and then compiled at the state level.

(g) Inter-sectoral coordination: Health Dept. receives updates from the Dept. of Disaster Management in case there is any forecast for a major natural calamity like a cyclone or very heavy shower. At the district level, an exchange of information goes on between the General Admin. and Health for alerts and updates on the unfolding of events. At the sub-District level, the Block Medical Officers are advised to keep in touch with the Block Development Officer so that the places where health care has to be rendered can be identified and necessary transport support (in the unusual situation) can be obtained.

(h) Capacity building: Orientation programmes are held from time to time for hospital administrators, peripheral Medical Officers, Health Supervisors, and Public Health Nurses, often in collaboration with the Administrative Training Institute of the State Govt.

(i) Financial support: Adequate fund is placed with the District health authorities before the monsoon as a general allotment for drugs and consumables. So that there be no dearth of logistics necessary for flood preparedness. In case a widespread calamity occurs, additional allotment is provided as and when necessary.

	Close liaison is to be established and maintained with Meteorology Department to receive real-time warning dissemination for environmental and climatic situations in different parameters so that the adaptation and mitigation plan can be taken in advance to prevent the health-related impact. At the district level, an exchange of information has to take place from time to time between the General Administration and Health for alerts and updates on unfolding of events. At the sub-District level, the Block Medical Officers are advised to keep in close touch with the Block Development Officer at the time of any natural calamity.

Strategies for further action:

- Thorough updating of the District Plans and the State Master Plan.
- Fresh mapping of the vulnerable areas with renewed inputs.
- Structured vulnerability needs assessment with technical support from GOI.

- Mechanism of regular data sharing with Meteorology Dept. (GOI), which may help in long-term planning (beyond imminent alerts) and may also encourage the generation of disease alerts, once the data analysis capacity enhances.
- Preservation of data on the management of disasters at the state and district levels. These may be important inputs for future planning.
- Further extension and quality improvement of Disaster Management Training for Health Personnel.
- Generation of public awareness on combating disasters, beyond health education on hygiene and sanitation.

Stakeholder departments:

- Dept. of Disaster Management
- Indian Meteorology Dept.
- General Administration
- Dept. of Environment
- Panchayat & Rural Development
- UD & MA
- Dept. of Irrigation & Waterways

Adaptation Plan

AWARENESS GENERATION:

IEC on emerging climate-sensitive health impacts and diseases

a) Under the programme, awareness generation amongst all the relevant stakeholders including the common population, vulnerable communities, healthcare providers, and policymakers around the impacts of disaster events.

b) The districts are aimed to create awareness through Information, Education, and Communication Activities (IEC) through the development of locally and culturally more acceptable messages in posters, audio, video, organising public health events, and issuing advisories related to disaster management. The content for the IEC for disaster management will be provided by the State NPCCHH division. The role of the districts is

to utilize these materials, translate the required material, and disseminate them at all levels.

c) Sensitization of the health professionals/ communities on emerging climate-sensitive health impacts and diseases.

Observance of important environment-health days

Day	Activities
• International Day for Disaster Risk Reduction	IEC Campaigns • Audio-video spots broadcasting • Targeted awareness sessions: women, children, occupational groups • Mock drill, disaster response exercise • Sports events • Competition: poster, poem/essay, quiz Health facility-level activities • Health facility-based patient awareness sessions • Conduct an assessment of disaster vulnerability/energy/ water conservation measures • Review of implementation of climate-resilient measures

Capacity Building

a) Refreshers training of the health professionals

b) Meeting the compensation process for the family for the death of the person due to disaster

Training plan on disaster management is as follows:

TABLE 1: NPCCHH TRAINING PLAN AT DISTRICT LEVEL

Training Programme	Trainer	Participants	Training Content
Medical Officers (3 days)	DNO	MO (DH,CHC,PHC)	Disaster Management
Community Health Care Workers (HWC) (2 days)	MO	Community Health Workers (MPHW, ASHA)	
Panchayati Raj Institutions (1 day)	MO, MLHP	Panchayati Raj Institutions, communities	

Strengthening Health Sector Preparedness

i. **Early warning:** Dissemination of early warnings for heat waves, cold waves, floods, cyclones, etc. to the health facility **level** and community level

ii. Surveillance

a) Monitoring of the cases in collaborative efforts with IDSP/ Zoonotic Disease Department and State Disaster Management Authority
b) Post-disaster health impact assessment

iii. Health Facility Preparedness

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

Roles and Responsibilities

Particulars	Responsibilities
SNO	• Disseminate early warnings to the 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 assessment and implementation of climate-resilient measures in health facilities • Review implementation of IEC, training, and surveillance activities at all levels • Evaluate and update relevant sections of SAPCCHH with support from State Task Force • Create organizational support and strengthen the Environmental

	Health cell to implement NPCCHH vision, goal, and objectives • Organize sensitization workshops for other stakeholders and line departments • Collaborate with academic institute/s for support in updating SAPCCHH, Surveillance activity monitoring, training of health care professionals, vulnerability assessment, and applied research • Submit reports of activities on EWE and health under NPCCHH
DNO	• Disseminate early warning to the block and health facility levels • Ensure IEC dissemination to the community level and facilitate community-level IEC activities • Organize training for block health officers and MO • Formalize intersectoral coordination for disaster planning, management, and response with SDMA/IMD and other response departments • Liaison with other departments for combined IEC campaigns, coordinated response and information sharing of health indicators for targeted action • Identification and communication of evacuation routes and relief camps • Support planning and management of health care services in relief camps • Provide necessary IEC on health and sanitation in relief camps • training for block health officers, and medical officers with relevant training manuals • Conduct sensitization of vulnerable groups women, children, etc. • Organize IEC campaigns at the district level on the observance of important environment-health days • Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessments and health facility damage due to EWE • Update DAPCCHH with support from District Task Force • Submit reports of activities on EWE and health under NPCCHH
Block Health Officer	• Conduct community-level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshops and training for vulnerable groups • Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessments and health facility damage due to EWE
Medical Officer	• Conduct health facility-based IEC activities • Support community-level IEC activities • Preparation of Disaster Management Plans and hospital safety plan

	• Assessment of health facilities in the 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
Panchayati Raj Institutions	• Conduct community-level IEC activities • Community involvement in planning and demonstration of measures taken before, during, and after EWE

Chapter 10

Health adaptation plan for Green and Climate Resilient Healthcare System

The aim of building climate-resilient and environmentally sustainable healthcare facilities is to enhance their capacity to protect and improve the health of their target communities in an unstable and changing climate and to empower them to optimize the use of resources and minimize the release of pollutants and waste into the environment. Such healthcare facilities contribute to a high quality of care and accessibility of services and, by helping reduce facility costs, also ensure better affordability. Healthcare facilities are the first and last line of defense against climate change impacts. They can be responsible for large emissions of greenhouse gases (GHGs), but also, they provide the needed services and care to people harmed by extreme weather and other climate hazards. Healthcare facilities can also produce large amounts of environmental waste and contamination (GHGs and other contaminants) which may be infectious, toxic, or radioactive and therefore a threat to the health of individuals and communities. Improving these is a priority and is key to building resilience and contributing to environmental sustainability.

Understanding Climate Resilience and Environmental Sustainability of healthcare facilities:

Climate-resilient Health care facilities are those that are able to anticipate, respond to, cope with, recover from, and adapt to climate-related shocks and stress, so as to bring ongoing and sustained healthcare to their target populations, despite an unstable climate. The figure presented below illustrates the important dynamics affecting the climate resilience of

healthcare facilities. The figure also highlights the risk management steps for prevention, preparedness, response, and recovery.

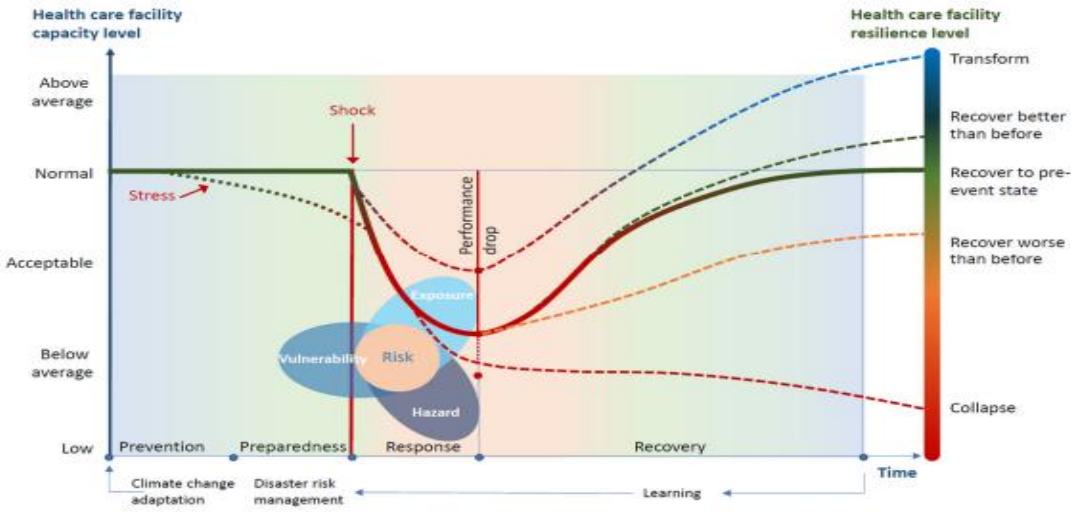


Figure 1. Climate resilience in health care facilities. Sources: [6–9].

Strengthening Climate Resilience and Environmental Sustainability:

Making HCFs climate resilient and environmentally sustainable would contribute to achieving SDGs related to climate change, sustainable consumption, water and sanitation, energy, employment, resilient infrastructure, and health and well-being.

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

Proposed process and steps for increasing climate resilience and environmental sustainability in healthcare facilities:

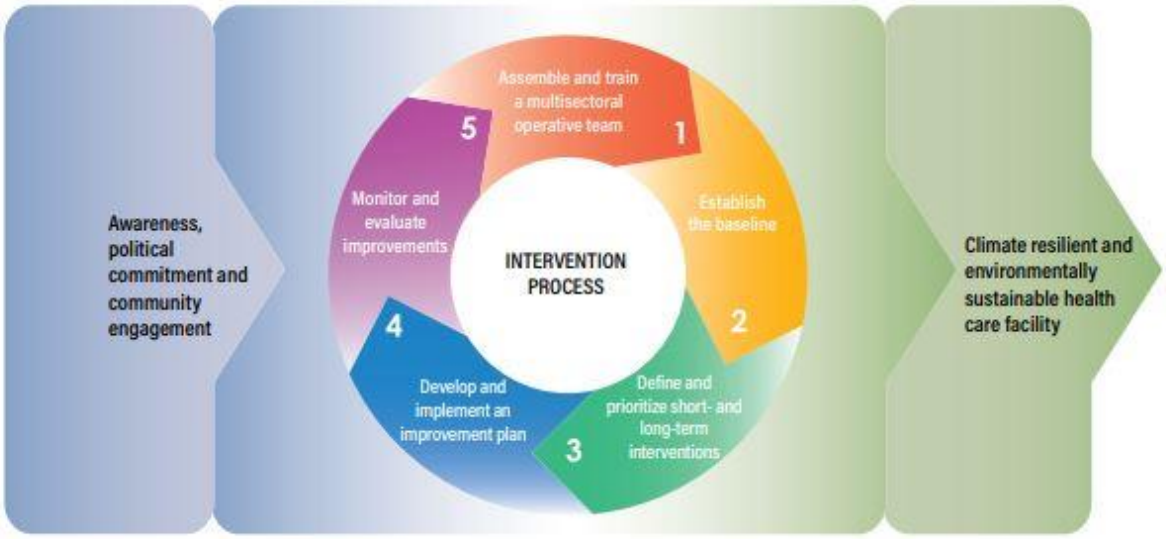


Fig.- Intervention process to improve climate resilience of healthcare facilities

1. **<u>Environmentally Sustainable (Green) Measures at Health Care Facilities</u>**

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 percent of water while heating ventilation and air conditioning (HVAC) consumes 23 pe 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 plants 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

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

It is essential that HCF planning and designing should be responsive to the 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 percent 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

Ongoing interventions for Climate Resilient Infrastructure and Green Measures in Healthcare Facilities in West Bengal

(a) Energy auditing in hospitals

__ hospitals have been identified in the state including both the government and private sector for 'mapping of hospital energy footprint' in collaboration with MOHFW and IPHA. A survey of the hospitals is being carried out at present.

The challenge remains to implement the recommendations of the energy audit in the coming years.

(b) Replacing LED lights with non-LED lights

The said activity is going on in 6 (six) hospitals in the state in the current financial year (2022-23). Further 9 (nine) hospitals have been identified to be taken up next year.

(c) Tree plantation hospitals

The spare land in the premises of different hospitals is being utilized. It's being done in collaboration with Forest Dept and PRI/ULB-s.

(d) Resilience to flood

In flood-prone areas, a new construction plan for health facilities ensures that the plinth level is specially raised. Raised walkways are constructed to connect different buildings so that water logging due to rain does not hamper staff movement within the premises.

(e) Power back-up

All hospitals down up to the level of Block PHC-s are provided with diesel generators (capacity depending on the tier of the facility) to ensure uninterrupted power supply even during natural calamities. This is critical for blood bank units, vaccine cold chain, emergency care, etc.

It's necessary is to sustain the ongoing activities and extend them further in variety and coverage with due emphasis on it in health sector planning. Convergence with NHM funding for Health Sector Strengthening needs to be explored.

IMPLEMENTATION PLAN:

Table 10.1: HEALTH SECTOR PREPAREDNESS FOR 5 YEARS 22-27

Objective	Activities	Priority districts	Identified Health facilities for 5 years for each	Timeline	Budget (in lakhs) for 5 years					Target for 5 years 22 - 27				
					22 to 23	23 to 24	24 to 25	25 to 26	26 to 27	22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
Strengthening Healthcare System	Energy Audit	28	PHC's / SHC/ HWC	February -April	12	23	543	886	1532		7 dist	7 dist	7 dist	7 dist
	Led installation-			April-May						6 facilities	9 facilities	15 facilities	20 facilities	25 facilities
	Solar Panels installation			May-August						-	-	6 facilities	11 facilities	18 facilities
	Rainwater Harvesting			August-October						-	-	6 facilities	11 facilities	18 facilities
	Retrofitting of Health care facilities			October-December						-	-	-	-	-

CAPACITY BUILDING

Training Plan for Capacity Building and System Awareness

In order to increase awareness of the citizens and healthcare providers towards climate change along with their role in mitigating the impacts of the same, a comprehensive dissemination program will be undertaken in the state with a top-down approach, as outlined below. This will flow as training provided by the State headquarters to the district officials, the district to the block, and so on. This will ensure that the policies of the program will be understood over all strata of society, various demographics, across gender, and age groups. The only way climate catastrophe can be averted and our health system be strengthened is when most citizens aid and support these policies of their own free will.

- **Training Plan**:

S. No	Level of Training	Target Audience
1.	State	CMOH, Deputy CMOH II/ DMCHO, DPHNO
2.	District	Superintendent of DH/SDH/SGH/SSH, ACMOHs, DPO-ICDS, DI Secondary, Block Medical Officer of Health, Municipality Health Officer, Sr. PHN/PHN, CDPO, RBSK District Coordinator, SI Secondary
3.	Block/ Municipality	RBSK Medical Officer, Health Supervisor, CHO, ANM, ICDS Supervisor, Anwesha Counsellor, ASHA, FTS & HHW

- **Dissemination activities**:

S. No.	Activity Planned at/ during	Facilitator	Target Audience
1.	School	RBSK Team/ Teachers	Students of Class V and onwards
2.	AWC	ICDS Supervisor/ Worker	Antenatal Mothers attending centre
3.	VHND	CHO/ANM/ ASHA	ANC mother, Adolescent, General people attending
4.	UHND	ANM	MAS members, ANC mother, General people attending
5.	GP level meeting	Health Supervisor/ ANM	PRI members, VHSNC members

Plan for Intersectoral Coordination

Intersectoral coordination is the most important aspect of handling transformative change and it is no different in this programme to tackle climate change.

Some of the most important areas are as follows:

A. Indian Meteorology Dept.
i) Dissemination of alerts for extreme weather events e.g. heat waves, cyclones, cloudburst/very heavy rain, excessive lightning, etc.
ii) Sharing of station-wise data on min & max temp, humidity, and rainfall.

B. Disaster Management Dept.
i) Sharing of forecast on extreme weather events up to the block level.
ii) Exchange of updates on affection caused by natural calamities.

C. Environment Dept and Pollution Control Board.
Exchange of data on air quality and alert for sudden predicted deterioration (if any).

D. Public Health Engineering.
Sharing of results of water quality survey; also information on the recession of ground water level - as a warning for water-borne diseases.

E. Dept. of WCD & SW.
i) Percolation of messages on the special vulnerability of women & children to climate change e.g. indoor air pollution, food scarcity (due to drought), unsafe water, etc.
ii) Advocacy to the community in regards to its role in preventing and adapting to climate change.

F. Dept. of Education.
i) Behavioral change communication among students in reference to climate change and the role of citizens.
ii) Promotion of safe practices to minimize the impact of climate change on health.

G. Police and Transport Dept.
Advocacy on measures to improve air quality.

H. Labour Dept.
Awareness generation and periodic health check-up of the vulnerable groups.

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 the state level in developing the capacity for a 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 a proposal and estimation of the budget for the identified health facilities for all activities and share it 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 a climate-resilient health system.
- Coordinate for energy auditing, ***energy conservation, solarization, rainwater 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 systems.
- Conduct activities for energy auditing, ***energy conservation, solarization, rainwater harvesting,*** retrofitting healthcare facility infrastructure (climate/ disaster resilient), etc.
- Provide a 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 function 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 sources and community involvement

Chapter 11: Budget

Climate Change & Human Health interventions, as a National Programme has come under the umbrella of National Health Mission since 2021-22.
Programme Implementation Plan (PIP) for the state has been drafted in consultation with the Programme Division of the Ministry. PIP for 2022-23 and 2023-24 has been prepared keeping both the national priorities and the locally felt needs in consideration.

The Budget Estimate & Activity Plan placed as a part of the NHM-PIP has been reviewed in the NPCC and finally approval has come from the GOI in the form of an ROP. The approved budget i.e. ROP approval is as follows:

Program name	**ROP code**	**Amount Proposed (in lakhs)**		**Amount Approved (in lakhs)**		**Activity Wise -Fund Breakup**
NPCCHH	114	**FY 2022-23**	**FY 2023-24**	**FY 2022-23**	**FY 2023-24**	
		128.68	144.87	128.68	144.87	**For FY 2022-23** Approved Rs. 128.68 lakhs as follows: a) Rs. 17.25 lakhs for capacity building and training. b.) Rs 12 lakhs for Other operational Costs- includes Greening of Health Facilities c.) Rs 86.40 lakhs for IEC & Printing d.) Rs. 11.08 lakhs for Planning and M&E e.) Rs 2.00 lakhs for surveillance, review, research & evaluation. **For FY 2023-24** Approved Rs. 144.87 lakhs as follows: a) Rs. 27.60 lakhs for capacity building and training. b.) Rs 18.00 lakhs for Other operational Costs- includes Greening of Health Facilities c.) Rs 89.62 lakhs for IEC & Printing d.) Rs. 7.65 lakhs for Planning and M&E e.) Rs 2.00 lakhs for surveillance, review, research & evaluation.

Stake holder engagement and community involvement are two essential areas of activities for Climate Adaptive Health Plan. So also, is the capacity building of the health managers and

community level care providers. Accordingly, a lion's share i.e. 64.2% of the total budget (2022-24) has been allotted for IEC & Printing and 16.4% has been apportioned for Capacity Building. For Greening of Health facilities, approx. 11% of the fund has been initially allotted. This may increase at later times.

The table below presents an overview of the proposed activities and the respective budget to be implemented under the climate change and human health programme between 2022-2027 in West Bengal. The detailed activities and the corresponding budgetary amount are enlisted in the table below-

S. NO.	ACTIVITIES	INDICATOR	BUDGET (in lakhs) for 5 years					TARGET for five years 22-27				
			22 to 23	23 to 24	24 to 25	25 to 26	26 to 27	22 to 23	23 to 24	24 to 25	25 to 26	26 to 27
PROGRAMME MANAGEMENT												
	Taskforce meeting to draft health sector plan for heat and air pollution	• % State Task Force Quarterly Meetings conducted in a year	0.5	0.5	1	1.5	2		3	3	3	3
		• % Districts conducted quarterly District Task Force Meetings in a year	2	2.5	3.5	3.5	4		3	3	3	3
	Sensitization workshop/meeting of the state programme Officers and District level Health Officers.		8	8	8.5	9	9.5		2	2	2	2
GENERAL AWARENESS												
03.	Development of IEC material, campaigns, Innovative IEC/ BCC Strategies	• % of implemented IEC on all climate sensitive issues	72	72	77	82	87	472 (Block + ULB)	472	472	472	472
CAPACITY BUILDING												

04.	Orientation/ Training /capacity Building of healthcare staffs	• % of Medical Officers/DNO/SN trained in Districts		11	13	15	17	472 (Block + ULB 1 meeting per block and ULB	472 (Block + ULB)- 1 meeting per block and ULB	472 (Block + ULB)- 1 meeting per block and ULB	472 (Block + ULB)- 1 meeting per block and ULB.	472 (Block + ULB)- 1 meeting per block and ULB.
		• % of targeted sensitization trainings planned for vulnerable population in district (PRI Training)	17.5	17.5	20	23	26	345	345 (1 meeting per block)	345 (1 meeting per block)	345 (1 meeting per block)	345 (1 meeting per block)
STRENGTHENING OF THE HEALTH SYSTEM												
05.	Adoption of Green/ Environment Friendly Measures in Health facilities	*Energy Audit*: • % of healthcare facilities per district per year that have conducted energy audit.	-	5	8	11	15	-	7 districts	7 districts	7 districts	7 districts
		LED lighting: • % of healthcare facilities per year that installed solar panel	12	18	30	45	57	6 facilities	9 facilities	15 facilities	20 facilities	25 facilities
		Solar Panel: % of healthcare facilities per district per year that installed solar panel	-	*	445	740	1320	-	-	6 facilities (1 DH, 2 SDH, 3 RH)	11 facilities (2 DH, 3 SDH, 6 RH)	18 facilities (4 DH, 6 SDH, 8 RH)

		Rain water harvesting: • % of healthcare facilities per district per year that installed rain water harvesting system.	-	-	60	90	140	-	-	6 facilities (1 DH, 2 SDH, 3 RH)	11 facilities (2 DH, 3 SDH, 6 RH)	18 facilities (4 DH, 6 SDH, 8 RH)

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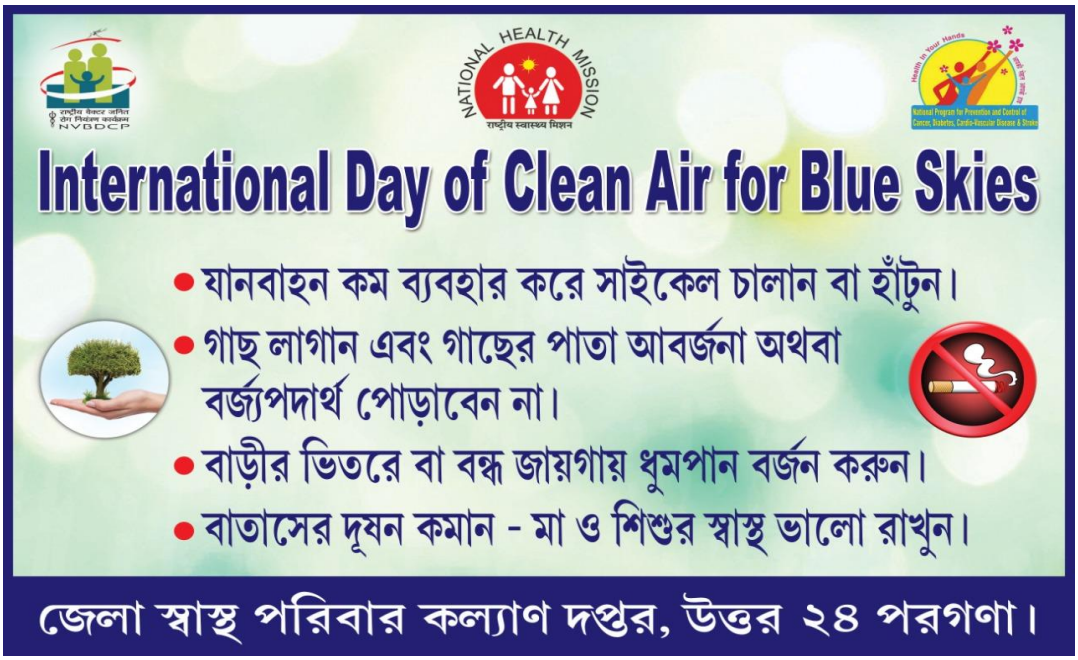
ANNEXURE A
IEC ACTIVITY ON AIR POLLUTION

IEC: In 2020,2021 and 2022, "Clean Air for Blue Skies" Week was observed in all the Districts of the State. IEC materials were developed in Bengali for this purpose (pictures given below). The following messages were emphasized in the materials.

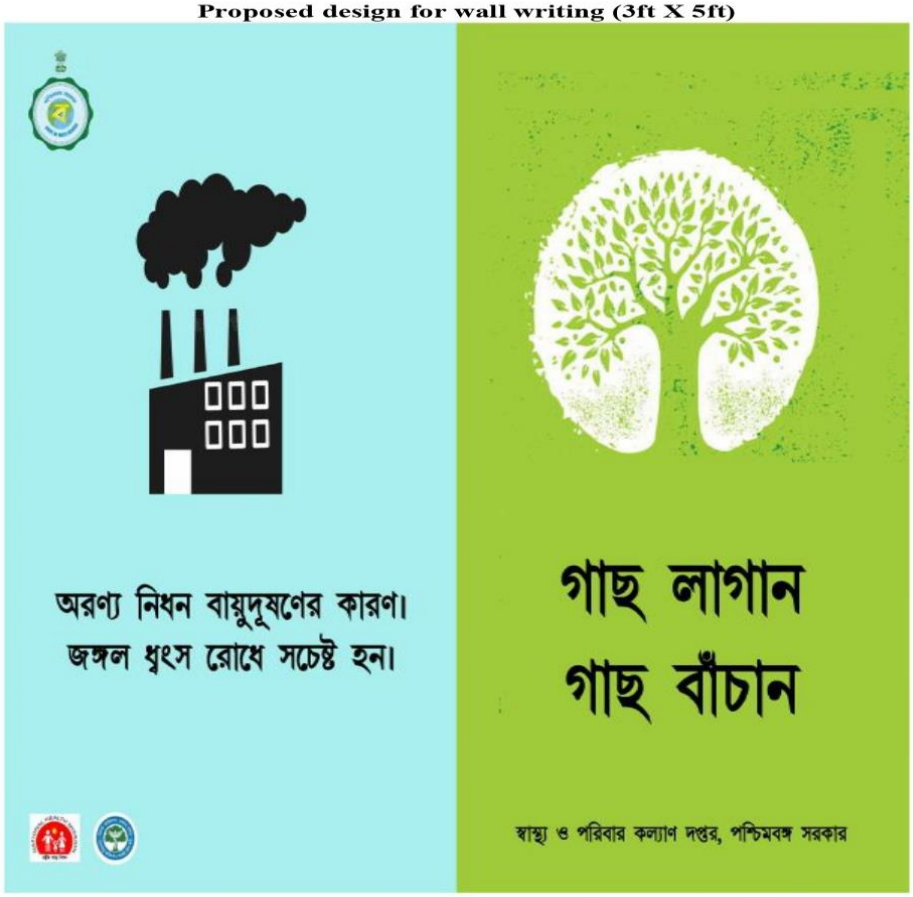
- Avoid smoking.
- Minimize the use of fuelled vehicles.
- Walk or use bicycles.
- Plant trees.
- Avoid burning of waste or dry leaves.
- Increase usage of renewable sources of energy e.g. Solar power
- Minimize usage of plastic bags- consider carrying cloth bags while shopping
- Minimize usage of Air conditioning / design well ventilated buildings


বাতাসে দূষণ কমান
জন সাধারন কে সুস্থ ও ভালো রাখুন
যানবাহন কম ব্যাবহার করে সাইকেল চালান বা হাটুন
গাছ লাগান এবং গাছের পাতা আবর্জনা অথবা
বর্জ্য পোড়াবেন না।
বাড়ীর ভিতরে বা বন্ধ জায়গায় ধুমপান বর্জন করুন।
স্বাস্থ্য ও পরিবার কল্যাণ দপ্তর, নদীয়া জেলা।


NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन
NVBDCP
International Day of Clean Air for Blue Skies
যানবাহন কম ব্যবহার করে সাইকেল চালান বা হাঁটুন।
গাছ লাগান এবং গাছের পাতা আবর্জনা অথবা
বর্জ্যপদার্থ পোড়াবেন না।
বাড়ীর ভিতরে বা বন্ধ জায়গায় ধুমপান বর্জন করুন।
বাতাসের দূষন কমান - মা ও শিশুর স্বাস্থ ভালো রাখুন।
জেলা স্বাস্থ পরিবার কল্যাণ দপ্তর, উত্তর ২৪ পরগণা।


OFFICE OF THE SUPERINTENDENT
KUSHMANDI RURAL HOSPITAL
Kushmandi • Dakshin Dinajpur
International Day of Clean Air for Blue Skies
48MP AI QUAD CAMERA

Proposed design for wall writing (3ft X 5ft)



ANNEXURE B
GUIDELINES FOR HEAT

তাপ-প্রবাহ : সাবধান হন ! অসুস্থতা প্রতিরোধ করুন !

গ্রীষ্মকালে পরিবেশের তাপমাত্রা অত্যধিক বৃদ্ধি পেলে শরীরের উপর নানারকম ক্ষতিকর প্রভাব পড়ে। বিশেষতঃ যাঁদের প্রচন্ড রোদ বা গরমের মধ্যে কাজ করতে হয়। পরিবেশে আর্দ্রতার মাত্রা বেশী থাকলে অসুস্থতার সম্ভাবনা আরও বেড়ে যায়। এই ক্ষেত্রে কী কী সাবধানতা অবলম্বন করা উচিত, জেনে নিন।

কী করবেন :

১। রোদে বেরোতে হলে ছাতা ব্যবহার করুন। অথবা মাথা ও কাঁধ ভিজে গামছা/ তোয়ালে/ কাপড় দিয়ে ঢেকে রাখুন।
২। বাইরের কাজ সকাল সকাল শুরু করে দুপুরের আগেই শেষ করুন।
৩। শীতল জল সঙ্গে রাখুন। তৃষ্ণা না পেলেও মধ্যে মধ্যে জল পান করুন। লবণ খাওয়ায় যদি নিষেধ না থাকে, জলের সঙ্গে সামান্য লবণ মিশিয়ে নিতে পারেন।
৪। পাতলা, ঢিলে এবং হালকা রঙের সুতির জামাকাপড় পরুন। কারোর প্রকৃতি অনুসারে রোদ-চশমা, ছাতা, দস্তানা ব্যবহার করা যেতে পারে।
৫। চড়া রোদে বা গরমে কাজ করতে করতে যদি মাথা-ঘোরা /অত্যন্ত ক্লান্তি /বমি-ভাব /মাথার যন্ত্রণা /জ্বর বোধ হয়, তবে যত তাড়াতাড়ি সম্ভব শীতল ছায়া জায়গায় গিয়ে বসে বা শুয়ে বিশ্রাম নিন। প্রচুর শীতল জল পান করুন এবং মাথায়, মুখে, ঘাড়ে শীতল জলের ঝাপটা দিন।

কী করবেন না :

১। চড়া রোদে বা গরমে দীর্ঘক্ষণ একটানা দাঁড়িয়ে থাকবেন না।
২। রোদে দাঁড় করানো গাড়ীর মধ্যে শিশুদের রেখে যাবেন না।
৩। এই সময় অতিরিক্ত চা-কফি, বোতলের ঠান্ডা পানীয় বা মদ্য পান করা ঠিক নয়। এতে দেহকোষে জলশূন্যতার ঝুঁকি বেড়ে যায়। বরং লস্যি, কম মিষ্টি দেওয়া সরবৎ, মরশুমি ফলে উপকার পাবেন।

প্রাথমিক চিকিৎসা :

তাপের প্রভাবে যদি আশেপাশে কেউ অসুস্থ হয়ে পড়ে, তবে তাকে দ্রুত শীতল ছায়া জায়গায় নিয়ে গিয়ে শুইয়ে দিন। জামা-কাপড় আলগা করে দিন। যদি জ্ঞান থাকে, তবে বারবার শীতল জল খাওয়াতে থাকুন। ORS পাউডার থাকলে জলে মিশিয়ে দিন। সারা দেহে এবং মাথায় শীতল জল ঢালুন ; বরফ জল দিতে পারলে খুব ভাল হয়। জোরে শরীরে জোরে জোরে বাতাস দিন। যদি রোগী অজ্ঞান হয়ে গিয়ে থাকে, তবে তাকে পাশ-ফেরানো অবস্থায় রাখবেন। মুখে লালা আটকে থাকলে পরিষ্কার করে দেবেন, যাতে শ্বাসনালীতে শ্বাসপ্রশ্বাস চলাচলে বাধা সৃষ্টি না হয়। পরবর্তী চিকিৎসার জন্য স্বাস্থ্যকেন্দ্র বা হাসপাতালে নিয়ে যাওয়ার ব্যবস্থা করুন।

স্বাস্থ্য অধিকর্তা
পশ্চিমবঙ্গ সরকার

স্বাস্থ্য ও পরিবার কল্যাণ দপ্তর, পশ্চিমবঙ্গ রাজ্য সরকার কর্তৃক জনস্বার্থে প্রচারিত

ANNEXURE C: STATE GUIDELINES DURING FLOODS AND CYCLONE

বন্যা প্রবণ এলাকার মানুষদের জ্ঞাতব্য

আমাদের রাজ্যে প্রায় প্রতি বছরই কোনো না কোনো জেলায় বন্যা হয়েই থাকে। নদী-বাঁধে ভাঙ্গন, নদী বা সুমুদ্রের জলোচ্ছ্বাস বা অতিবৃষ্টিতে জলমগ্ন হওয়ার ফলে বন্যা দেখা দেয়। এই সময় বহু মানুষকে ঘর বাড়ি ছেড়ে কোন শিবিরে বা উঁচু জায়গায় আশ্রয় নিতে হয়।অনেক লোক একসঙ্গে অল্প জায়গার মধ্যে থাকতে বাধ্য হয়।যারা বাড়িতে থেকে যেতে পারেন , তাদেরও দৈনন্দিন জীবন বিপর্যস্ত হয়ে পড়ে।

বন্যায় যেমন মানুষের আকস্মিক প্রাণহানি হতে পারে , তেমনই জলের ব্যাপক দূষণ, উপযুক্ত খাদ্যের অভাব, বিপর্যস্ত শৌচ বাবস্থা , অপরিছন্ন পরিবেশ, স্বাস্থ্য সচেতনতার অভাব ইত্যাদি কারনে বিভিন্ন সংক্রামক রোগেরও আশঙ্কা দেখা দেয়। যেমন ডায়ারিয়া, কলেরা হেপাটাইটিস(জন্ডিস) , টাইফয়েড ইত্যাদি।

বন্যা কবলিত এলাকায় বসবাস কারী জনসাধারণের আসন্ন বন্যা সম্পর্কে বিশেষভাবে সতর্ক থাকা প্রয়োজন । তারজন্যে নিম্নলিখিত বিষয় গুলি জানা, বোঝা ও মেনে চলা অত্যন্ত গুরুত্বপূর্ণ :

- প্রশাসন এর পক্ষ থেকে বন্যার কারনে স্থান ত্যাগ করার নির্দেশিকা জারি হলে দ্রুত তা পালন করুন এবং নিরাপদ স্থানে আশ্রয় নিন । এই বিষয়ে অযথা দ্বিধা বা দেরি করবেন না।

- আশ্রয়স্থলে যেখানে মানুষ থাকবেন, সেখান থেকে গৃহপালিত পশুদের যথা সম্ভব দূরে রাখুন।প্রয়োজনে গৃহপালিত পশুদের আশ্রয়ের জন্যে আলাদা ব্যাবস্থা গড়ে তুলুন।

বন্যার সময় কুয়ো টিউবওয়েল ইত্যাদি জলে ডুবে যায়; পুকুরের জলও দূষিত হয়ে পড়ে। ফলে নিরাপদ পানীয় জল পাওয়া মুস্কিল হয়ে পড়ে।এই বিষয়ে নিম্নলিখিত বিষয় গুলি কার্যকর করা উচিৎ-

ক) পঞ্চায়েতের সঙ্গে যোগাযোগ করে টিউবওয়েল গুলিকে পাইপজুড়ে উঁচু করার ব্যবস্থা করুন।তারপর সেটিকে শোধন করিয়ে নিন। বন্যাপ্রবন এলাকার টিউব ওয়েল গুলিকে বন্যার আগে থেকেই এইভাবে উঁচু করে নেওয়া সবথেকে ভাল।

খ) যদি প্যাকেটের জল সরবরাহ করা হয় , তবে সেই জল পান করুন।

গ) যদি বন্যার ফলে দূষিত টিউবওয়েল, কুয়ো বা পুকুরের জলই পান করতে বাধ্য হন , তবে তা ফুটিয়ে নেওয়াই সব থেকে ভাল।(ফুটতে শুরু করা থেকে আরও দশ মিনিট আঁচে রাখতে হবে।)

তা সম্ভব না হলে সংগ্রহ করা জল হ্যালোজেন বড়ি দিয়ে আথবা ক্লোরিন দ্রবন দিয়ে শোধন করে নিন।

- হ্যালোজেন বড়ি প্রতি লিটার জলে একটি, আধ ঘণ্টা রেখে তারপর জল পান করা যাবে।
- ক্লোরিন দ্রবন তৈরি করতে এক লিটার (চার গ্লাস) পরিস্কার জলে, চা চামচের সমান করে ছয় চামচ ব্লিচিং পাউডার মেশান।মিশ্রণের ওপর দিকের পরিস্কার জল কাঁচ বা প্লাস্টিকের পাত্রে বন্ধ করে রাখুন। তবে ঘন বাদামী বা ওইরকম গাঢ় রং এর পাত্রে ভরে ছায়ায় রাখা বাঞ্ছনীয়, তাহলে অন্তত এক সপ্তাহ এই দ্রবণ কার্যকরী থাকে। জলের পাত্রে ক্লোরিন দ্রবন লিটার পিছু তিন-চার ফোঁটা দিন।আধ ঘণ্টা রেখে তারপর জলপান করুন।

- জল যদি ঘোলা হয়, তাহলে, শোধন করার আগে ছেঁকে নিন। ছাঁকার জন্যে পরিস্কার সুতির কাপড় ভাঁজ করে ব্যবহার করুন। ছাঁকার আগে জলে ফটকিরি মেশালে জল আরও পরিস্কার হবে।
- কেবল খাওয়ার জন্যেই নয়, বাসনপত্র ধোওয়া বা রান্নার কাজেও দূষণমুক্ত জল ব্যবহার করুন। অন্যথায় বাসন মাজার পর ক্লোরিন দ্রবন (পাঁচ লিটার পরিস্কার জলে চা চামচের সমান করে ছয় চামচ ব্লিচিং পাউডার) দিয়ে শোধন করে নিন।
- বন্যার জল সরে গেলে পঞ্চায়েতের সঙ্গে যোগাযোগ করে টিউব ওয়েল গুলিকে শোধন করিয়ে নিন--

ক) টিউবওয়েলের হ্যান্ডেল এবং বাকেটের অংশগুলি খুলে নিচের সীট ভাল্বটি সরিয়ে নিতে হবে।তারপর এক দেশলাইবাক্স পরিমান ভাল মানের ব্লিচিং পাউডার জলে গুলে নীচের চুন অংশটি বাদ দিয়ে বাকিটুকু পাইপের মধ্যে ঢেলে দিতে হবে।বাকেট পিস্টন ইত্যাদিকে এইরকম ব্লিচিং জল দিয়ে ভাল করে ধুয়ে নিতে হবে। বারো ঘন্টা রাখার পর কিছুটা জল পাম্প করে বার করে দেবেন।তারপর টিউবওয়েলটি ব্যবহারের যোগ্য হয়ে উঠবে।

খ) কুয়ো শোধন করার জন্যে এলাকার স্বাস্থ্যকর্মীর সংঙ্গে যোগাযোগ করুন।

গ) শোধন করা টিউবওয়েলের বা কুয়োর কাছে সবুজ কাপড় বা ওই ধরনের কোন নিশান উঁচুতে ঝুলিয়ে দিন।

- শিবির বা আশ্রয় স্থলে, যেখানে সেখানে পায়খানা বা প্রস্রাব করিবেন না। করিলে সংক্রামক রোগ ছড়িয়ে পড়ার আশঙ্কা থাকে--

ক) শিবিরের পায়খানা ঘরগুলি পরিস্কার ও দূষণমুক্ত রাখার জন্যে চুন (নয় ভাগ) ও ব্লিচিং পাউডারের (এক ভাগ) মিশ্রণ ছড়ান।

খ) যদি পায়খানা না থাকে তাহলে, মাটিতে গর্ত করে অস্থায়ী পায়খানা বানাতে হবে। গর্তটি আকারে লম্বা ১.৫ ফুট, চওড়া ১ ফুট, এবং ৩ থেকে ৫ ফুট গভীর হবে।তবে গর্তটি জলের উৎস থেকে যথাসম্ভব দূরে (৩০ থেকে ৫০ ফুট)হওয়া উচিত।

গ) খোঁড়া মাটি গর্তের কাছাকাছি রাখবেন। প্রতেকবার পায়খানার পর কিছু মাটি এবং ব্লিচিং পাউডার (যদি পাওয়া যায়) মলের ওপর চাপা দিয়ে দেবেন।

ঘ) জলশৌচের পর অবশ্যই সাবান দিয়ে হাত ধুয়ে নিতে হবে।

- রান্না বা খাওয়ার আগে এবং শিশুকে খাওয়ানোর আগেও সর্বদা সাবান্ দিয়ে হাত ধুয়ে নিতে হবে।
- ঘরের চারপাশ এবং আশ্রয়স্থল যথাসম্ভব পরিস্কার রাখুন।যত্রতত্র ময়লা বা আবর্জনা ফেলবেন না।

ডায়ারিয়া হলে কি করবেন

- যদি ৬ মাসের কম বয়সের শিশুর ডায়ারিয়া হয় এবং সে কেবল বুকের দুধ খায়, তবে তাকে বারবার বুকের দুধ দিন। এবং মাঝে মাঝে ও. আর. এস. দিন।
- শিশুর বয়স যদি ছয় মাসের বেশি হয় বা সে দুধ ছাড়া অন্যান্য খাবার খেতে শুরু করে থাকে তবে তাকে ঘরে পাওয়া যায় এমন তরল খাবার দিন।যেমন নুন মিশিয়ে ভাতের ফ্যান, ডালের জল, ঘোল, ডাবের জল,ফলের রস ইত্যাদি।
- স্বাস্থ্যকর্মী বা আশাকর্মীর সাথে যোগাযোগ করে ও. আর. এস. এর প্যাকেট জোগাড় করুন। তরল খাবার এবং ও. আর. এস. বারবার দিন।
- বড়রা ডায়ারিয়া আক্রান্ত হলে জলশূন্যতা প্রাতিরোধের জন্য তরল খাবার এবং ও. আর. এস. বারবার খাবেন।

❖ ডায়ারিয়া দেখা দিলে শুরু থেকেই তরল খাবার দিতে থাকুন।দেড়ি করবেন না, তাহালে শরীরে জলশূন্যতা দেখা দিতে পারে।

❖ **ও. আর. এস. এর পাকেট থেকে কিছু কিছু করে পাউডাড় নিয়ে গ্লাসে ঢালবেন না।পাকেটের পুরো পাউডাড় একসাথে এক লিটার জলে মিশিয়ে নিয়ে তারপর তার থেকে ঢেলে ঢেলে খাওয়াবেন। ও. আর. এস. এর দ্রবণ ২৪ ঘণ্টার মধ্যে ব্যাবহার করবেন। ২৪ ঘণ্টার বেশী হয়ে গেলে না ব্যাবহার করে ফেলে দেবেন।**

- ডায়ারিয়া দেখা দিলে শিশুর খাওয়া বন্ধ করবেন না। কারণ আন্ত্রিক রোগে শরীরে খাদ্য শোষণ করার ক্ষমতা নষ্ট হয় না। তাই সহজে হজম হয় এমন খাবার অল্প অল্প করে বারেবারে দিন। যেমন-গলা ভাত,মাছ বা শব্জির পাতলা ঝোল,পাতলা ডাল, শুকনো মুড়ি,বিস্কুট ইত্যাদি।
- **ডায়ারিয়া আক্রান্ত শিশুদের জিঙ্কের বড়ি খাওয়ান।** ২ মাস থেকে ১০ বছর বয়সী শিশুদের জন্যে এই বড়ি সাব সেণ্টার থেকে পাবেন।২ মাস থেকে ৬ মাস বয়সী শিশুদের জন্যে অর্ধেক করে প্রতিদিন মোট টানা ১৪ দিন এবং৬ মাস থেকে ১০ বছর বয়সী শিশুদের জন্যে একটি করে প্রতিদিন মোট টানা ১৪ দিন খাওয়াতে হবে।
- যেকোন মল এমনকি শিশুর মল ও যেখানে সেখানে ফেলবেন না । মল সেপ্টীক ট্যাংকে ফেলুন বা মাটিতে গর্ত করে পুঁতে ফেলুন।
- মানুষের চলাফেরার জায়গা এবং জলের উৎস , যেমন পুকুর, কুয়ো, টিউবওয়েল ইত্যাদি থেকে নিরাপদ দুরত্বে রোগীর জামা কাপড় কাচুন।পায়খানা পরিষ্কার এর পরে সাবান দিয়ে ভালো করে হাত ধুয়ে নিতে হবে।

❖ ডায়ারিয়া আক্রান্ত শিশুর যদি এই লক্ষণগুলির মধ্যে কোন একটি দেখা দেয়, তাহলে তাকে অবিলম্বে মেডিকাল অফিসার এর কাছে পাঠাতে হবে।

- শিশু জল খেতে পারছে না বা বেহুঁশ হোয়ে পড়ছে ।
- শিশু অযথা ছট পট করছে বা বিরক্তি ভাব দেখাচ্ছে ।
- খূব তেষ্টা বা জল টেনে নিয়ে খাচ্ছে ।
- বার বার বমি ।
- পায়খানাতে রক্ত ।
- প্রবল জ্বর বা শ্বাস কষ্ট ।

❖ বড়দের ক্ষেত্রে যদি জল এর মত পায়খানা হতে থাকে, প্রবল বমি যদি বন্ধ না হয়, পায়খানা তে রক্ত দেখা যায় , জলশূন্যতা তৈরি হয়ে থাকে তাহলে অবিলম্বে মেডিক্যাল টিম বা মেডিক্যাল ক্যাম্প এর সাহায্য নিন।

জলবায়ুর পরিবর্তন ও স্বাস্থ্য

মানুষের জীবনযাত্রা পরিবর্তনের কারণে চারপাশের বায়ুর দূষণ এবং তাপমাত্রা প্রতিনিয়ত বেড়ে চলেছে। সেই কারণে খরা, বন্যা, ঘূর্ণিঝড়, তাপপ্রবাহ বাড়ছে। প্রত্যক্ষ ও পরোক্ষ ভাবে এর প্রভাব মানুষের স্বাস্থ্যের উপর ও পড়ছে। সেই সঙ্গে ডায়রিয়া, ক্যান্সার, শ্বাসকষ্ট জনিত রোগ এবং পতঙ্গ বাহিত রোগ বেড়ে চলেছে।

বায়ুদূষণ জনিত স্বাস্থ্য সমস্যা ও তার প্রতিরোধ

বায়ু দূষণের ফলে অ্যাজমা, নিউমোনিয়া, ব্রংকাইটিস প্রভৃতি নানাবিধ শ্বাসের অসুখ, চোখ-মুখ ও গলার রোগ, ক্যান্সার এবং হার্টের রোগ হয়। বায়ুদূষণে বেশী ক্ষতি হয়, শিশু, গর্ভবতী মহিলা এবং বৃদ্ধদের। শুধু বাড়ির বাইরেই নয়, দূষণ হয় বাড়ির ভিতরেও।

বায়ুদূষণ সমস্যার প্রতিকার -

- যেখানে সম্ভব গাছ লাগান, গাছকে রক্ষা করুন।
- সাধারণ উনুনের জায়গায় ধোঁয়াহীন চুলা ব্যবহার করুন।
- কয়লা বা কাঠের উনুনের বদলে গ্যাসের ব্যবস্থাই কাম্য।
- বদ্ধ জায়গায় বা শিশুদের সামনে বিড়ি-সিগারেট খাবেন না।
- পরিবেশকে আবর্জনা মুক্ত রাখুন।
- গাড়ি বা বাইক চড়ার পরিবর্তে যতটা সম্ভব হাঁটুন, সাইকেল ব্যবহার করুন।
- যথাসম্ভব এয়ারকান্ডিশন কম ব্যবহার করুন।
- সাধারণ বাতির পরিবর্তে এল.ই.ডি. বাল্ব ব্যবহার করুন। এতে দূষণ কম হয়।

তাপপ্রবাহ - কিভাবে সাবধান হবেন

পরিবেশের তাপমাত্রা অত্যাধিক বৃদ্ধি পেলে শরীরের উপরে নানারকম ক্ষতিকর প্রভাব পড়ে। এতে শরীর কাহিল হয়ে পড়া থেকে স্ট্রোক পর্যন্ত হতে পারে। গরমের দিনে খেয়াল রাখবেন - তাপপ্রবাহ বিষয়ে কোনও সতর্কতা বিজ্ঞপ্তি আছে কিনা। সেই অনুসারে আপনার দিনের কাজের পরিকল্পনা করুন।

হিট স্ট্রোক এড়াতে কী করবেন ঃ-

- রোদে বেরোতে হলে ছাতা ব্যবহার করুন। অথবা কাঁধ-মাথা ভিজে গামছা বা কাপড় দিয়ে ঢেকে নিন। মাঝে মাঝেই ঠান্ডা জল খান। তৃষ্ণা না পেলেও খান। লবণ খাওয়ায় কোনও নিষেধ না থাকলে জলে অল্প লবণ মিশিয়ে নিন।
- পাতলা, ঢিলে হাল্কা রঙের সুতির জামা কাপড় পরুন।
- রোদে বা গরমে কাজ করতে করতে যদি শরীর খারাপ লাগে কিংবা খুব ক্লান্তি বোধ হয়, তবে শীঘ্র ঠান্ডা ছায়া জায়গায় গিয়ে শুয়ে বা বসে পড়ুন। অনেকটা জল খান। মাথায়, মুখে ঠান্ডা জলের ঝাপটা দিন।

কী করবেন না ঃ-

- বদ্ধ জায়গায় বেশীক্ষণ থাকবেন না।
- খুব গরমে একটানা দাঁড়িয়ে থাকাও উচিত নয়।
- বন্ধ গাড়ির মধ্যে শিশুকে ছেড়ে যাবেন না।
- গরমের মধ্যে অতিরিক্ত চা-কফি বা বোতলের ঠান্ডা পানীয় খাবেন না। এতে দেহে জলশূন্যতা দেখা দিতে পারে। বরং ডাব, লস্যি, কম মিষ্টি দেওয়া সরবৎ, মরশুমি ফলে উপকার পাবেন।


প্রাকৃতিক বিপর্যয়ের ফলে স্বাস্থ্য সমস্যা ও তার প্রতিকার ঃ-
❖ খরা, বন্যা, ঘূর্ণিঝড়, ভূমিধ্বস ইত্যাদি বিপর্যয়ের সময় জীবনের স্বাভাবিক নিরাপত্তা বিঘ্নিত হয়। বাসস্থান, খাদ্য জল ইত্যাদি সংকটের সময় ডায়রিয়া, জ্বর, শ্বাসকষ্ট প্রভৃতি অসুখ ও সাপের কামড়ের সম্ভবনা বেড়ে যায়।
❖ প্রাকৃতিক বিপর্যয়ের আগে অনেক সময় নিরাপদ আশ্রয়ে সরে যেতে বলা হয়। এই ক্ষেত্রে প্রশাসনের সঙ্গে সহযোগিতা করবেন।
❖ গবাদি পশুদেরও নিরাপদে রাখার ব্যবস্থা করবেন।
❖ জীবাণু মুক্ত পানীয় জল ছাড়া অন্য জল খাবেন না। জল শোধনের জন্য স্বাস্থ্যকর্মীরা যে হ্যালোজেন বড়ি দেন, তা জলে মিশিয়ে আধঘন্টা পরে পান করতে পারেন।
❖ হাত পরিষ্কার রাখার দিকে বিশেষ ভাবে নজর দিন। রান্না বা খাওয়ার আগে এবং শৌচ কাজের পরে অবশ্যই সাবান দিয়ে হাত ধোবেন।
পতঙ্গ বাহিত রোগের সমস্যা ও তার নিয়ন্ত্রণ ঃ-
কীটপতঙ্গের কামড়ে যে রোগগুলি ছড়ায়, জলবায়ু পরিবর্তনের সঙ্গে সঙ্গে সেগুলির ঝুঁকি আরও বাড়বে। তার মধ্যে ডেঙ্গি, ম্যালেরিয়া, স্ক্রাব টাইফাস ও কালাজ্বর আমাদের রাজ্যে খুবই গুরত্বপূর্ণ।
নিয়ন্ত্রণের উপায় -
❖ মশা ডিম পাড়ে স্থির জমা জলে। বাড়ির আশপাশে বা ছাদে যেন ফুলের টব, ভাঁড়, প্লাস্টিকের জিনিসপত্র,
❖ ডাবের খোলা, টায়ার ইত্যাদি পড়ে না থাকে। কারণ তার মধ্যে বৃষ্টির জল জমতে পারে।
❖ পুকুর বা নর্দমায় আবর্জনা ফেলবেন না। নর্দমায় যেন জল আটকে না থাকে।
❖ জলের ড্রাম, ট্যাঙ্ক ও কুয়োর মুখ কাপড় কিংবা নাইলনের জল দিয়ে ঢেকে রাখুন।
❖ বাড়ির চারপাশ ঝোপঝাড় মুক্ত রাখুন।
সপ্তাহে একদিন - চারদিক দেখে নিন।
❖ ঘুমানোর সময় মশারি ব্যবহার করুন।
❖ মাইটের কামড় এড়াতে মাঠে বা বাগানে কখনও খালি পায়ে যাবেন না।
❖ ইঁদুরে গায়ে মাইট থাকে। তাই ইঁদুরের সংখ্যা না বাড়ে, সেদিকে নজর দিন।
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স্বাস্থ্যবিধি মেনে চলুন। সুরক্ষিত থাকুন। সন্তানকে ও সু-অভ্যাসের শিক্ষা দিন।
পশ্চিমবঙ্গ সরকারের স্বাস্থ্য ও পরিবার কল্যাণ দপ্তর থেকে জনস্বার্থে প্রচারিত