सत्यमेव जयते
Government of India

Ministry of Health and Family Welfare

Government of India

STATE ACTION PLAN FOR CLIMATE CHANGE & HUMAN HEALTH

ODISHA

(Revised Version- 29.09.2022)

National Programme on Climate Change & Human Health
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State Action Plan for Climate Change and Human Health 2022-2027

Odisha

National Centre for Disease Control
Government of India

National Programme on Climate Change and Human Health

Executive Summary

Climate change is a growing concern for sustainable development. Sustainable Development Goal 13 emphasizes taking urgent action to combat climate change and its impacts. Climate change poses several threats to the health of the population. Health effects of climate change occur either through direct effects (changes in temperature and precipitation and occurrence of heat waves, floods, droughts, and cyclones, etc.) or indirect effects (ecological disruptions resulting in crop failures, shifting patterns of diseases' vectors, or displacement of the population).

National Action Plan on Climate Change and Health (NAPCCH) called for state-specific action plans to be prepared. As the adaptation challenges are experienced most acutely at the state level determined by the demographic, socio-economic, and physiographic situations in the states, it is imperative to determine the precautionary and anticipatory measures for facing the expected changes and adapting to the same by using long-term strategic planning such as state action plan on climate change and human health.

The state of Odisha is well known for its vulnerability to environmental hazards like cyclones and floods. In recent years, climate change impacts are evident in Odisha, mainly in terms of increasing cyclones, heat waves, dry spells, and floods. The health impact of climate change is already evident in the state as it is experiencing increased urbanization as well as an increase in the incidences of Non- Communicable Diseases. Odisha also witnessed the emergence and re-emergence of many infectious diseases including vector-borne and zoonotic diseases in recent years. In Odisha, the health of human populations is sensitive to shifts in weather patterns and other aspects of climate change, owing to urbanization, dependency on agriculture, depletion of forest cover, increased energy consumption, variation in food production, vector-borne diseases, geographically hard to reach districts and large tribal population. In view of the above requirement, the Government of Odisha has been working on a strategy for action in the state in response to climate change and health.

The State Action Plan for Climate Change and Human Health (SAPCCHH) proposes a multi-pronged approach to address the health-related aspects of climate change. It envisions strengthening the health of these citizens of Odisha against climate-sensitive illnesses. The goal is to reduce morbidity, mortality, injuries, and health vulnerability to climate variability and extreme weather. Objective is to build the capacity of health care services against the adverse impact of climate change on human health.

Acknowledgement

The guidance and oversight provided by Shri Naba Kishore Das, Hon'ble Minister for Health, Principal Secretary, Health and Family Welfare, Ms. Shalini Pandit, State Mission Director, NHM Odisha, and senior officials from Odisha State Disaster Management Authority, and National Centre for Disease Control to develop the Odisha Strategic Action Plan for Climate Change and Human Health is gratefully acknowledged.

This document is based on inputs provided by officials and experts from the Odisha State Departments of Health & Family Welfare and Disaster Management Authority. Active contributors include the experts from the Health Services Department and State Pollution Control Board. The strategies and activities were planned under the guidance and administrative support of Dr. Bijay Kumar Mahapatra, Director of Health Services.

Technical coordination and documentation support was done under the leadership of Dr. Basant Pradhan, State Nodal Officer-National Program for Climate Change and Human Health (NPCCHH), supported by Dr. Upasona Ghosh, Assistant Professor, Indian Institute of Public Health, Bhubaneswar (PHFI) and Dr. Shridhar Kadam, Director, Indian Institute of Public Health, Bhubaneswar (PHFI).

Graphic Layout & Design by- Avnesh Sharma, Technical Officer-NPCCHH, Delhi

1. Introduction

South Asian countries are already experiencing the impacts of climate change in the form of altered precipitation patterns, high rate of sea level rise, and extreme temperatures, all of which threaten the region's life, livelihood, health, and well-being. Their particular vulnerabilities are a result of their complex topographic variation from the Himalayan mountains to the plains to long coastlines and low-lying islands. The region has been experiencing natural and anthropogenic climate change manifestations in terms of recession of Himalayan glaciers in mountainous regions and sea level rise, ocean and freshwater intrusion, and sea surface temperature changes in the coastal and island regions. The changing monsoon patterns are leading to erratic and unpredictable droughts, and the intense rainfalls is increasing the region's vulnerability to natural disasters such as floods, landslides, cyclones, and heat waves.

India is a signatory to the "Male' Declaration", in accordance to which the health sector is to be strengthened so as to make it climate resilient, particularly to encourage that it is able to withstand any climatic event, and that essential services such as water, sanitation, waste management, and electricity are functional during such events. Further, for climate resilient health sector, the health department has to undertake measures to initiate the greening of the sector by adopting environment-friendly technologies and using energy-efficient services.

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

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

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

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

2. Climate Change in Odisha: vulnerabilities, challenges, and opportunities

a. Geography and Demographics

Odisha is the 9th largest state by area and the 11th largest state by population in India. The state has an area of 155,707 km2, which is 4.87% of the total area of India, and a coastline of 450 km2. In the eastern part of the state lies the coastal plain. It extends from the Subarnarekha River in the north to the Rushikulya River in the south. The state is broadly divided into four geographical regions, i.e. Northern Plateau, Central River Basins, Eastern Hills, and Coastal Plains. The climate of the state is characterized by hot summer and cold winter in the interior parts. The state has historically been highly prone to climate change and multiple hazards, mainly cyclones, droughts, and floods. Natural disasters devastate millions of lives and livelihoods in Odisha each year.

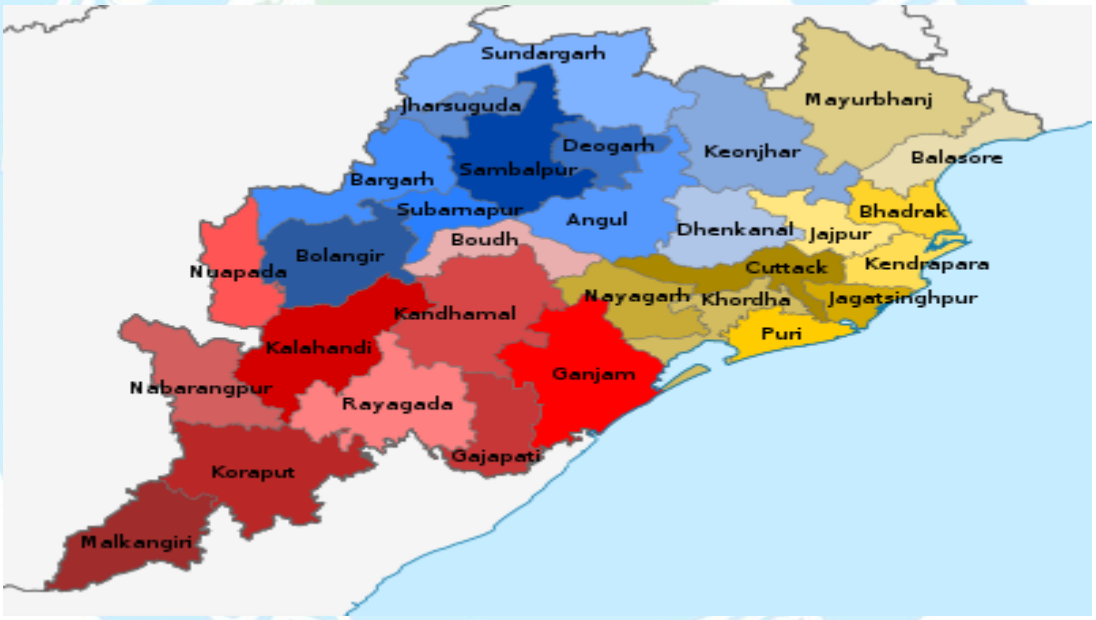


Figure 1 Districts of Odisha

Odisha's geographic location on the east coast of India and its climatic condition reveals that the state has historically been highly prone to climate change and multiple hazards. A study on the effects of disasters reveals that between 1963 and 1999, Odisha experienced 13 major disasters, which killed 22,228 people (state government figure) and rendered more than 34 lakhs homeless (Mohapatra, 2006). According to the state government's Human Development Report 2004, property loss has been steadily growing every year over the past few decades due to climate change and disasters (GoO, 2004). Thus, the impact of climate change has been associated with a number of changes which have serious implications for life in the state.

Odisha is mainly rainfall dependent as its irrigation network does not cover the entire state. The agriculture sector is vulnerable to the vagaries of climate-induced weather changes. Food security is also threatened in different parts of Odisha due to climate change-induced

disasters. Rise in temperature and sea level has made agriculture vulnerable as the gushing sea water combined with erratic rain often destroys the crops. Sea water is more often gushing into the agricultural land, filling it with saline water, which is directly affecting farmers and slowly weakening the agricultural productivity in the state. Agriculture across the coast of Odisha is now facing a serious climate emergency. The climatic variations could further multiply the vulnerability of the poor by adversely affecting their health and livelihoods and impeding the development of the state. It is evident that climate change in Odisha has the potential to tremendously aggravate water stress, food security, and health system.

b. Climate vulnerability:

a. Agriculture

Agriculture holds a predominant position in the state's economy. About 80-85% of the state's population is rural and depends on agriculture. The agriculture sector contributes about 26% of the GSDP. Here, almost 60% of the land is under rain fed agriculture. Water dependent crops such as rice, is particularly vulnerable to the vagaries of climate change. Further, paddy fields in the coastal areas are prone to frequent erosion, salinization, and inundation. Climate projections indicate that drier areas will become drier and flood-prone areas will be subject to more flooding. Other problems such as pest and disease outbreaks are also likely to increase due to climate variability.

b. Coastal Zones and Disasters

Odisha has been prone to disasters. Frequent droughts, floods, and cyclones are recurrent features in the state and have had a crippling effect on the economy. In 1999, a severe cyclone followed by a super-severe cyclone lashed the entire coast of Odisha causing large scale loss of life. Whilst the extent to which climate change will exacerbate floods and droughts is not yet fully understood, it is clear that their frequency and intensity will increase. While Odisha has done pioneering work on disaster management through the Odisha State Disaster Management Authority (OSDMA), the first of its kind in the country, there is a considerable need to improve own understanding of the climatic impacts on disasters and to build capacity of communities to adapt, manage, and mitigate their impacts. The figure depicts the district wise wind and cyclone hazard map which reflects that the entire coastline is highly vulnerable to cyclonic activities, increased in last 10 years, due to climate change.

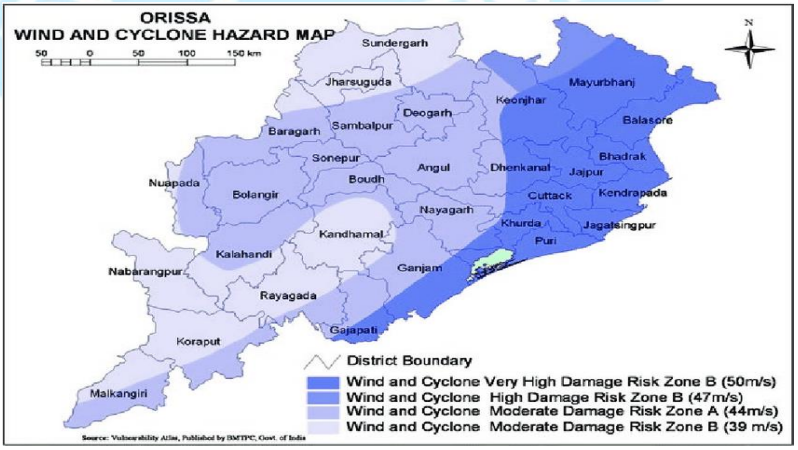


Figure 2 District wise Wind and Cyclone map of Odisha

c. Fisheries and Animal Resources

The fisheries sector in Odisha is also at the receiving end of the impact due to climate change. The livelihoods of the fisher folks are most affected, not only due to sea level rise and climate mediated hazards, but also due to erratic rainfall that affects the open reservoirs and ponds/tanks. Animal resources are impacted by heat stress and other climatic impacts. Methane emission from the livestock is a key concern.

d. Forests

Forests provide livelihoods to a large proportion of the tribal population and rural poor. The forests also serve important ecological functions, such as checking soil erosion and reducing the impact of droughts, floods, and cyclones (presence of mangroves). Forests are also particularly important both from climate mitigation as well as adaptation perspectives. While no assessment of the impact of climate changes on Odisha forests has yet been undertaken, it is nonetheless necessary to evaluate the long-term effects of climate change on forests and determine what the community might do in response.

e. Urban Planning

The continuous exodus of the rural population to urban areas in Odisha has contributed to urban growth. There is already a severe strain on the existing urban infrastructure.

The Government of Odisha is initiating urban planning measures in a sustainable development manner based on lessons from past mistakes / experiences of other Indian cities (particularly the metropolitan cities) including climate-sensitive urban development.

Table 1 District wise distribution of population including vulnerable population

S. No.	District	Population on as per Census 2011	Estimated Projectd Population on (2021-22)	Crude birth rate (CBR) 2011 - 2012 census	Estimated under 5 years population (5 years, 2016 census available)	Estimated 15-19 Years (2016 census available)	Estimated (60 -64 yrs)
1	Angul	1273821	1429355	17.5	21145	130053	44373
2	Balangir	1648997	1850340	20.8	20328	124082	50501
3	Balasore	2320529	2603866	18.8	37823	233472	73230
4	Bargarh	1481255	1662116	17.6	20238	123920	54910
5	Baudh	441162	495028	28.8	7176	40348	15527
6	Bhadrak	1506337	1690261	20.5	25549	163251	54068
7	Cuttack	2624470	2944918	19.5	35351	217888	217888
8	Debagarh	312520	350679	18.4	5256	31561	11103
9	Dhenkanal	1192811	1338453	20.9	17297	106644	43073
10	Gajapati	577817	648368	20.2	11700	50229	18743
11	Ganjam	3529031	3959926	19.0	58976	343918	130740
12	Jagatsinghapur	1136971	1275795	17.7	15107	96351	46194
13	Jajapur	1827192	2050292	18.3	27806	176298	64790
14	Jharsuguda	579505	650263	17.0	8304	52632	18280
15	Kalahandi	1576869	1769405	20.2	26892	134410	58530
16	Kandhamal	733110	822623	21.2	15545	67819	25453
17	Kendrapara	1440361	1616229	18.7	21371	133529	54924
18	Kendujhar	1801733	2021725	20.3	31457	169158	53620
19	Khorda	2251673	2526602	18.9	32274	198660	75799

20	Koraput	1379647	1548102	25.1	25902	108191	40777
21	Malkangiri	613192	688063	24.4	10749	46237	15342
22	Nabarangapur	1220946	1370024	24.1	25894	106589	38391
23	Nayagarh	962789	1080346	20.6	12933	79764	36038
24	Nuapada	610382	684910	22.5	9973	50611	20850
25	Puri	1698730	1906145	17.5	23418	144425	63167
26	Rayagada	967911	1086093	22.7	19043	79128	30128
27	Sambalpur	1041099	1168217	18.6	15386	94835	35470
28	Subarnapur	610183	684686	20.9	9171	9171	21763
29	Sundargarh	2093437	2349046	17.9	33248	204154	61938
30	Mayurbhanj	2519738	2827398	19.8	4823	225546	86363

Further, the state health infrastructure details are indicated in the table below

Table 2 District-wise health infrastructure- Odisha

Districts	Sub Centers	PHCs	CHCs	Sub-divisional Hospital	District Hospital
Anugul	166	31	9	3	1
Balangir	226	48	15	2	1
Baleshwar	275	73	17	1	1
Bargarh	204	49	15	1	1
Bhadrak	178	54	7	0	1
Boudh	67	12	5	0	1
Cuttack	332	73	22	2	0
Deogarh	42	8	4	0	1
Dhenkanal	167	38	10	2	1
Gajapati	136	22	8	0	1
Ganjam	460	101	28	4	0
Jagatsinghapur	189	35	11	0	1
Jajapur	260	62	12	0	1
Jharsuguda	66	20	6	0	1
Kalahandi	242	46	18	1	1
Kandhamal	172	40	14	1	1
Kendrapara	227	46	8	1	1
Kendujhar	351	67	17	2	1
Khordha	202	75	16	0	1
Koraput	307	51	16	0	1
Malkangiri	158	27	6	2	1
Mayurbhanj	589	88	28	3	1
Nabarangpur	289	41	10	1	1
Nayagarh	166	38	12	1	1
Nuapada	95	17	5	1	1
Puri	241	52	17	0	1
Rayagada	235	39	11	1	1
Sambalpur	167	36	11	2	0
Sonepur	89	20	5	1	1
Sundargarh	390	69	21	1	2
Total Districts=30	**6688**	**1378**	**384**	**33**	**27**

Furthermore, the health indicator data for the state of Odisha is indicated in the table below-

Table 3 State Health Indicators

Indicators	NFHS 4	NFHS 5
Infant mortality rate (IMR)	40	36.3
Neonatal mortality rate (NNMR)	28.2	27.0
Under-five mortality rate (U5MR	48	41.1
Children age 12-23 months fully vaccinated	78.6	90.5
Children aged 6-59 months who areanemic	44.6	64.2
Mothers who had an antenatal check-up inthe first trimester (%)	64.0	76.9
Mothers who had at least 4 antenatal carevisits (%)	61.9	78.1
Average out-of-pocket expenditure perdelivery in a public health facility (Rs.)	4,226	4,139
Institutional births (%)	85.3	92.2
Pregnant women aged 15-49 years whoare anemic	47.6	61.8
Total unmet need (%)	13.6	7.2
Current Use of Family Planning Methods -Any method (%)	57.3	74.1
Sex ratio of the total population	1036	1063
Total fertility rate	2.1	1.8

3. NPCCHH programme Goal, Vision, and Objectives

Vision

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

Goal

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

Objective

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

Specific Objectives

Objective 1:

To create awareness among 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 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:

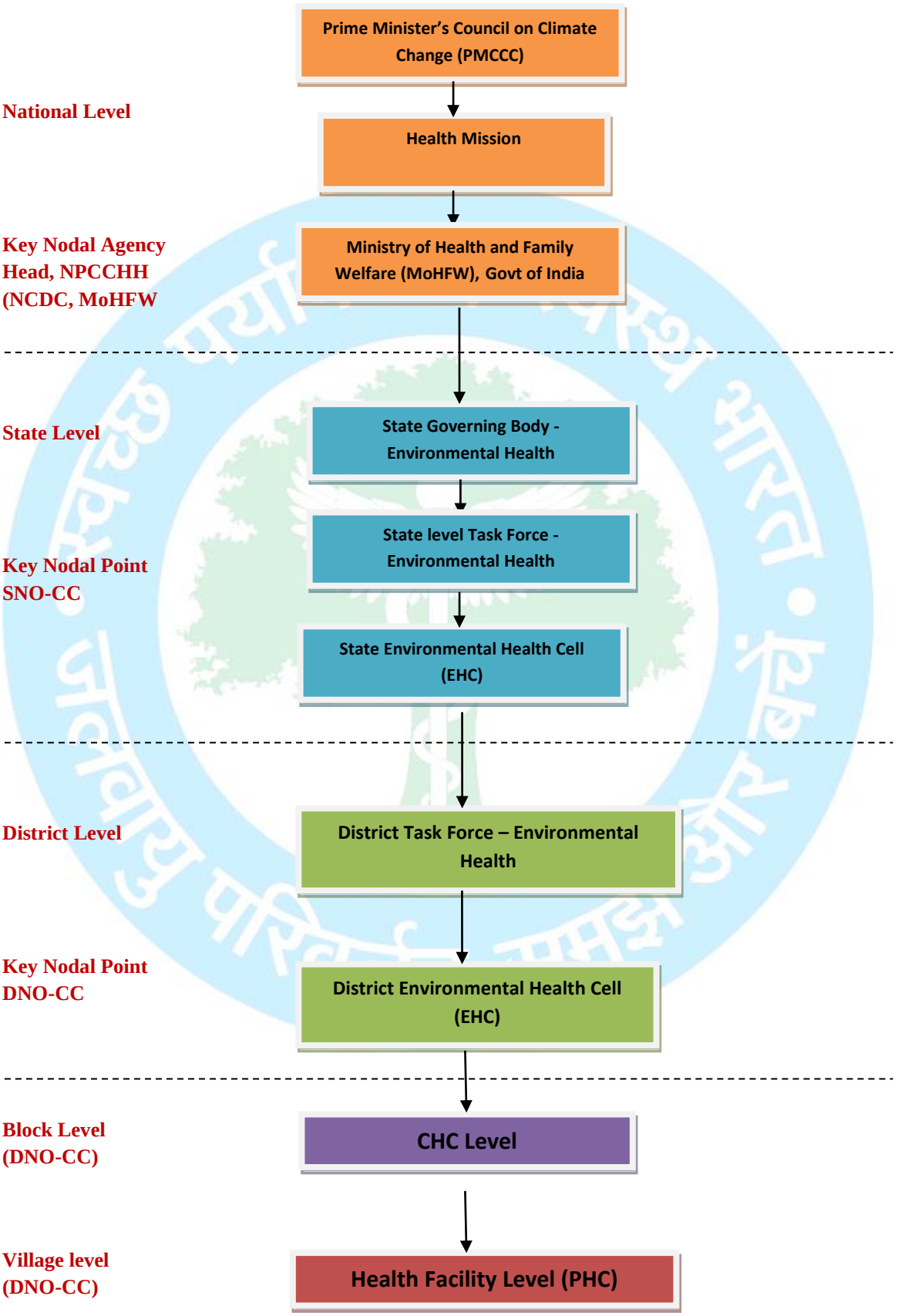
To develop partnerships and create synchrony/ synergy with other missions and ensure that health is adequately represented in the climate change agenda in the country in coordination with the Ministry of Health & Family Welfare.

Objective 5:

To strengthen state research capacity to fill the evidence gap on climate change impacts on human health.

4. Organizational Structure of NPCCHH

Figure 3 Organizational Frame of SAPCCHH



A) State Level - Governing Body - Environmental Health

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

Honorable State Health Minister	Chairman
Principal Secretary (Health*)*	*Vice Chairman*
Director Health Services/Head of Health System	Member Secretary
Mission Director-National Health Mission	Member
Principal Secretary, Ministry of Revenue (Disaster)	Member
Principal Secretary, Ministry of Agriculture	Member
Principal Secretary, Ministry of Water and Sanitation	Member
Principal Secretary, Ministry of Transport	Member
Principal Secretary, Ministry of Animal Husbandry	Member
Principal Secretary, Ministry of Environment and Forests	Member
Principal Secretary, Ministry of Women and Child Development / Social Justice	Member
Principal Secretary, Ministry of Science and Technology/ Earth Sciences	Member
Principal Secretary, Ministry of Education	Member
Principal Secretary, Ministry of Human Resource Development	Member
Principal Secretary, Ministry of Public Works Department	Member
Principal Secretary, Ministry of Power	Member
Principal Secretary, Ministry of Urban Development (Municipalities)	Member
Principal Secretary, Ministry of Finance	Member
Principal Secretary, Ministry of Law	Member
Principal Secretary, Ministry of Food and Civil Supplies	Member
Principal Secretary, Ministry of Panchayati Raj	Member
Regional Director -Health & Family Welfare (GoI)	Member
Director Medical Education and Research	Member
State Nodal Officer- Climate Change	Member
Head – NAPCCHH, CEOH&CCH Division, NCDC	Member

B) State Level Task Force - Environmental Health

This task force is working under the guidance of Principal Secretary (Health) of the state. It is responsible to directly overseeing the implementation of the State Action Plan for Climate Change and Human Health (SAPCCHH) in the state. It is working through the Directorate of Health Services (DHS) of the state, which is the implementing agency for SAPCCHH. The members include:

Principal Secretary (Health)	Chairperson
Mission Director-National Health Mission	Vice Chairman
Director Health Services/Head of Health System	Member Secretary
Director/ Chairman - Department of Revenue (Disaster)	Member
Director/ Chairman - Department of Agriculture	Member
Director/ Chairman - Department of Water and Sanitation	Member
Director/ Chairman - Department of Transport	Member
Director/ Chairman - Department of Animal Husbandry	Member
Director/ Chairman - Department of Environment and Forests	Member
Director/ Chairman - Department of Women and Child Development / Social Justice	Member
Director, Meteorological department of State/UT	Member
Director/ Chairman - Department of Public Works Department	Member
Director / Chairman – Department of Urban Development (Municipalities)	Member
Director/ Chairman -Department of Education	Member
Director/ Chairman - Department of Food and Civil Supplies	Member
Director/ Chairman - Department of Human Resource Development	Member
Director/ Chairman - Department of Power	Member
Director/ Chairman - Department of Finance	Member
Director/ Chairman - Department of Law	Member
Director/ Chairman - Department of Panchayati Raj	Member
Director/ Chairman - State Ground Water Board	Member
Head - State disaster Management Authority	Member
Environmental Engineer/ Scientist from Ministry of Environment	Member
Chairman, State Pollution Control Board	Member

Regional Director -Health & Family Welfare (GoI)	Member
Director Medical Education and Research	Member
State Nodal Officer- Climate Change	Member
Director, ICMR Institute/Centre (If any branch in the State/UT)	Member
State Surveillance Officer	Member
Head – NAPCCHH, CEOH&CCH Division, NCDC, MoHFW	Member
Head, NCDC Branch of the state	Member

The Task force of the Odisha Environmental Health Cell coordinates with the Centre (MoHFW, NCDC) for the reporting and monitoring of the execution of SAPCCHH. Further, DHS the Environmental Health Cell within the State Health Department has identified a Nodal Officer from the Health department. The State Level Structure of Environmental Health Cell is as follows:

Nodal Officer (Public Health Expert - State Health Department)	1
Consultant-Capacity building/ Training/ HR Management	1
Consultant-Environmental Health	1
Data Manager & Analyst	1
Secretarial Assistants cum Data entry Operator	1

C) Executive Members of EHC

State Nodal Officer- Climate Change	Chairman
State Program Manager – NHM	Member
Additional Director Public Health/NCD	Member
Additional Director NVBDCP	Member
Additional Director Immunization / Family Welfare	Member
Additional Director Medical (Mental Health)	Member
State Surveillance Officer/ Additional Director Epidemic	Member
Head, State Nutrition Bureau	Member
Consultant, SHSRC	Member
Additional Director, IEC/ State Mass Media	Member
State Epidemiologist, IDSP	Member
State Veterinary Consultant	Member
Microbiologist, IDSP	Member

D) Roles and Responsibilities of the State Environmental Health Cell

- Preparation and implementation of State Action Plan for Climate Change and Human Health
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate sensitive illnesses in the state/ UT.
- Assessment of needs for health care professionals (training, capacity building) and organise training, workshop, and meetings.
- Maintain state and district level data on physical, financial, and epidemiological profile for climate-sensitive illnesses
- Ensure convergence with NHM activities and other related programs in the state / district
- Monitor programme, review meetings, and field observations
- Timely issue of warning/ alerts to health professionals and related stakeholders as well as general public through campaign or using mass media (electronic or printed)
- Social mobilization against preventive measures through involvement of women's self-help groups, community leaders, NGOs etc.
- Advocacy and public awareness through media (street Plays, folk methods, wall paintings, hoardings etc.)
- Conduct of operational research and evaluation studies for climate change and its impact on human health

E) District Level

At the district level, District Medical Officer/ Chief Medical Health Officer are going to be designated as District Nodal Officer, appointed by the DHS. A District Level Task Force has been constituted by the District Nodal Officer- Climate Change in consultation with the SNO-CC for all the districts in Odisha.

Structure of District Level Task Force- Environmental Health

District Collector	Chairman
Dean – Govt Medical College in the district/ Head- Department of Community Medicine of the Medical College	Vice Chairman
Chief Medical Officer/ District Medical Officer / District Nodal Officer – Climate Change.	*Member Secretary*
District Surveillance Officer	Member
District Programme Manager – NHM	Member
District Head, Department of Revenue (Disaster)	Member
District Head, Department of Agriculture	Member
District Head, Department of Water and Sanitation	Member
District Head, Department of Transport	Member
District Head, Department of Animal Husbandry	Member
District Head, Department of Environment and Forests	Member
District Head, Department of Women and Child Development / Social Justice	Member

District Head, Department of Science and Technology/ Earth Sciences	Member
District Head, Department of Education	Member
District Head, Department of Food	Member
District Head, Department of Human Resource Development	Member
District Head, Department of Public Works Department	Member
District Head, Department of Power	Member
District Head, Department of Finance	Member
District Head, Department of Law	Member
District Head, Department of Panchayati Raj	Member

The District Environmental Health Cell constituted by the District Nodal Officer- Climate Change in consultation with the SNO-CC has following members:

District Nodal Officer- Climate Change	Chairman
District Veterinary officer	Member
District Surveillance Officer/ District Epidemic Officer	Member
District RCH officer/FW Officer	Member
District Epidemiologist	Member
District Microbiologist	Member
District Immunization Officer	Member
District Training Officer	Member
Data entry operator	Supporting staff

Roles and Responsibilities of the District Environmental Health Cell

- Preparation and implementation of District Action Plan for Climate Change and Human Health
- Conduct Vulnerability assessment and risk mapping for commonly occurring climate-sensitive illnesses in the district.
- Maintain and update district database of illnesses identified in the district.
- Assess needs for healthcare professionals and conduct sub-district/ CHC level training/ workshop and meetings for capacity building.
- Ensure appointment of contractual staff and engage them in the assigned task of data management under the NAPCCHH.
- Maintain district level data on physical, financial, and epidemiological profile for these illnesses.

Community Health Centre Level

The proposed CHC Level Structure is as under:

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

Health Facility Level (PHC):

At the health facility, the responsibility for programme implementation rests with the Medical Officer (in-charge) of the facility. The existing machinery of NHM is utilized for the related activities. The Rogi Kalyan Samiti (RKS) would be reviewing and monitoring implementation at the health facility level. The ANM, ASHA, and Anganwadi workers assist in activities related to the implementation of the action plan at the local level.

PART #2

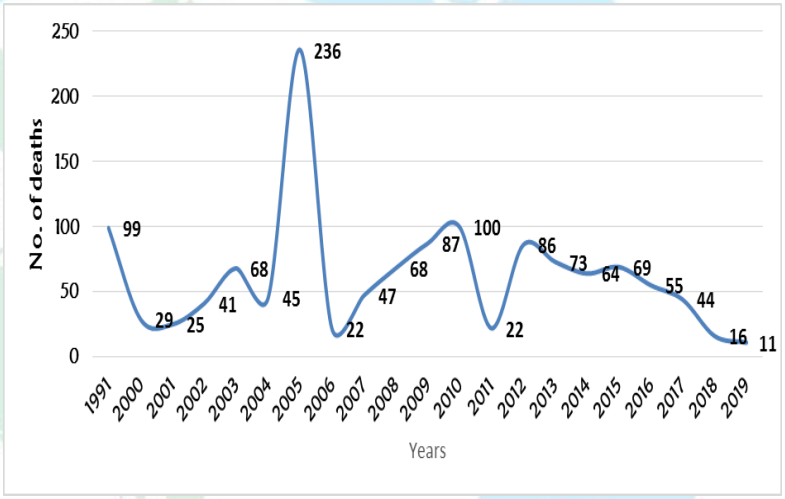
Climate-sensitive issues/ diseases prevalent in Odisha

The climate of Odisha that hugs the coast of the Bay of Bengal is represented by a tropical monsoon weather. Searing hot summers with considerably high monsoon downpours and cool and pleasant winters mark the Odisha climate.

The climate of Odisha is distinctly related to the state's geography. Broadly, the weather of Odisha can be classified under three heads i.e. summer, monsoon, and winter. The state is also endowed with relatively short stints of the refreshing spring.

The scorching heat of the Odisha summer makes the mercury soar to unbearable heights. However, monsoon creeps in to offer a welcome break. The average rainfall recorded by the state's meteorological department is 200 cm. By early June, the southwest monsoon announces its arrival in the state and departs by the middle of October. The rains also play a pivotal role in agriculture, the principal source of livelihood of the populace of Odisha.

Figure 4: Year wise reported heat wave deaths in Odisha (1991 to 2019)



Although the state has been successful in controlling a number of communicable diseases earlier, the emergence of chikungunya, leptospirosis, hepatitis , and H1N1 in recent years has led to considerable morbidity and mortality. Instances of vector-borne diseases like dengue, malaria, Japanese encephalitis, scrub typhus, etc. have seen a marked increase in many districts. Water borne infections such as different kinds of diarrheal diseases, typhoid and hepatitis are showing persistence in many districts. Cholera has surfaced in many districts after few years of relative low incidence. Incidences of Malaria are strongly affected by climate change. Transmitted by Aedes mosquitoes, dengue is a fast-growing challenge, particularly in the coastal areas of Odisha in recent years. Female Aedes aegypti mosquito, vector of dengue, and Chikungunia are highly sensitive to climate conditions. Any disease caused, transmitted, or harbored by insects, snails, and other cold-blooded animals can be affected by a changing climate e.g. Lyme disease and tick-borne Encephalitis, Salmonella, and other food borne infections.

Table 4: Priority Districts for environmental disease outbreak

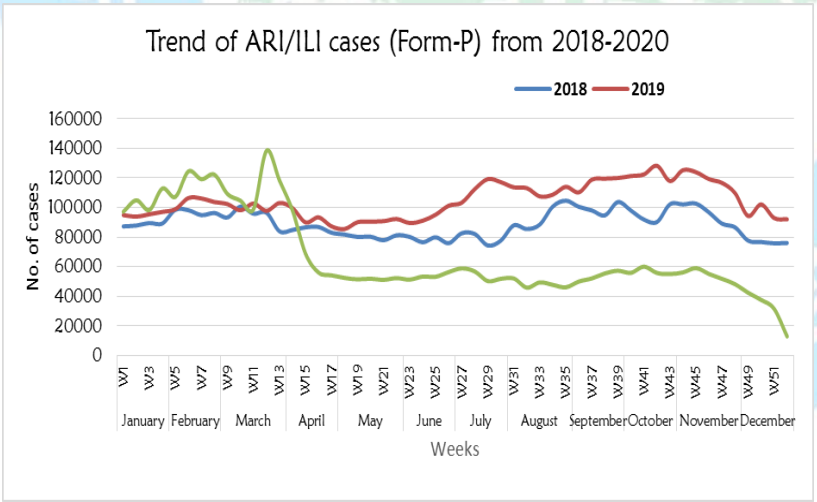
Type of Outbreaks	Affected Districts
Acute Diarrhoeal Diseases	Angul, Ganjam, Dhenkanal, Kalahandi, Nuapada, Nabarangapur, Baragarh).

Infectious diseases also appear in new locations, where people do not have immunity and health services and may not have experience in controlling or treating the infections, and the the effects can be dramatic. Also, a change in the pattern of infectious disease with reference to climatic factors is expected in the coming years. Also, geographically, people living in coastal regions, water logged areas, and hilly areas are all particularly vulnerable in different ways. In the state of lack of access to clean water supply and sanitation, along with poor hygiene is already the main contributor to the burden of diarrheal disease.

Hepatitis	Khurda, Jagatsinghpur, Sonepur, Bolangir, Nayagarh & Baragarh
Measles	Nawarangapur, Koraput, Rayagada, Mayurbhanja, Ganjam, Deogarh
Swine Flu	Angul, Jagatsinghpur
Anthrax	Koraput, Malkangiri

Following are the main climate-sensitive diseases of Odisha:

- Acute Respiratory Illnesses attributed to Air Pollution (Asthma, ARI, and Cancer)
- Heat-related illnesses
- Vector-Borne Diseases (Malaria, Dengue, Chikungunya, JE, Scrub typhus, etc.)
- Water Borne Diseases (Diarrhoea, Hepatitis A & E, Typhoid, etc.)
- Food Borne Diseases
- Nutrition-related diseases
- Allergic Diseases
- Cardio-pulmonary Diseases
- Mental Health
- Zoonotic Diseases
- Specific illnesses to sea and coastal area
- Due to extreme weather events (floods, cyclones such as Fani, Philin, Hudhud etc.) affecting health

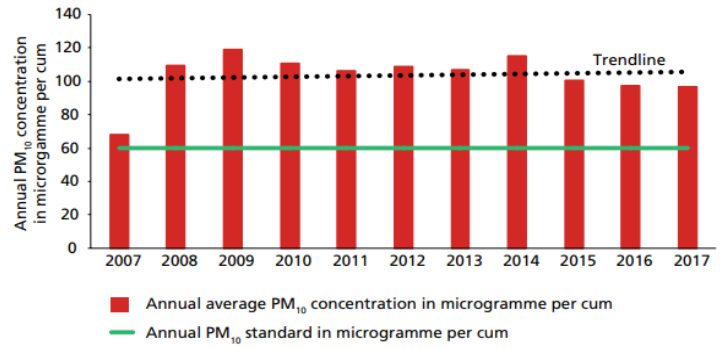


At present, the state has the burden of both communicable and non-communicable diseases. Due to epidemiological transition, a large proportion of population in Odisha is susceptible to water borne diseases like hepatitis A, ADD leading to explosive outbreaks. In Odisha, the health of human populations is sensitive to shifts in weather patterns and other aspects of climate change, owing to urbanization, depletion of forest cover, increased energy consumption, indoor and outdoor air pollution, variation in food production, vector-borne diseases, inadequate sewage and waste management, and issues of inaccessibility to health care in some parts of the state.

Adaption plan to Climate-sensitive Health Issues

a. Health Adaptation Plan for acute respiratory illnesses due to Air Pollution

Graph 3A. Angul—long-term trend in annual average level of PM10 concentration



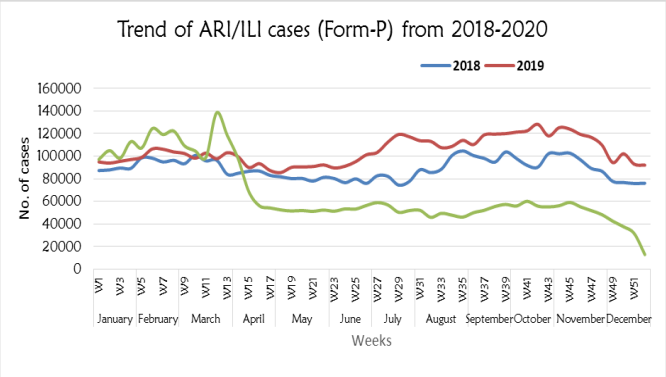
Source: Based on the annual data provided by OSPCB.

Air pollution is a major environmental risk to health. The formation, transport, and dispersion of many air pollutants is determined partly by climate and weather factors such as temperature, humidity, wind, storms, droughts, precipitation, and partly by human activities known to produce various air pollutants. It is thus logical to assume that climate change will influence the dynamics of air pollution. By reducing air pollution levels, the state can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.

Two major types of Air Pollution:

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

Prominent causes of Ambient Air Pollution in Odisha:



There are various causes of both ambient and indoor air pollution in the state of Odisha. Major reasons for ambient air pollution are:

1. Pollution by automobiles in major cities
2. Industrial emission in the districts with higher concentration of industries.

For indoor air pollution the major sources are:

1. Use of firewood/ dry cow dung/coal/kerosene
2. Burning of waste
3. Outdoor air pollution that invades indoor air like industrial emission
4. Chemicals used in houses such as floor cleaners

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

Both indoor and outdoor air pollution caused significant burden of ARI/ILI cases in urban districts of Odisha

Air Quality Index: Air Quality Index is a tool for effective communication of air quality status to people in terms, which are easy to understand. It

transforms complex air quality data of various pollutants into a single number (index value), nomenclature and color.
As per the State Pollution Control Board (SPCB) the cities mentioned in the following table have AQI level above 200 (data for year 2018-2019)-

S. No.	Name of the city	District	Highest AQI value in previous year	Reasons for High AQI
1	Talcher	Angul	191	Industrial emission
2	Rourkela	Sundergarh	154	Industrial Emission
3	BMC Bhubaneswar	Khordha	158	Pollution by Automobiles Industrial Emission
4	CMC, Cuttack	Cuttack	161	Pollution by Automobiles Industrial Emission
5	Balasore City	Balasore	159	Pollution by Automobiles

Health Adaptation Plan

A. Awareness Generation

To increase general awareness among all the relevant stakeholders including the vulnerable communities, healthcare providers and policy makers on the impacts of air pollution on human health and ways to address them.

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, audios, videos, organizing public health events, and issuing advisories related to air pollution.
The content for the IEC for the air pollution related issues will be provided by the State NPCCHH division under the supervision of State Nodal Officer (SNO). The state will translate the content into the Odia language (local) for the districts to utilize these materials and disseminate at all levels. The communication method will be largely through posters, hoardings/billboards, audio-video clips in mass media and messages in social media platform like twitter, WhatsApp groups, and Facebook between the months of September to February every year.

Communication Strategies	Content

Posters: At least 1-2 large wall poster and/ 1-2 foam board posters printed and disseminated in all healthcare facilities and all government educational institutes **Hoardings/billboard**: 5-10 billboards on air pollution will be placed in public areas **Wall painting**: 1-2 wall paintings on air pollution and impacts on health per healthcare facility **Audio-video clips on air pollution and health should run in mass media throughout the year** • 1-2 video clips of 1-2 minutes duration broadcasted on air pollution and health. • Video clips display on the digital board located in main city points • Social media: Twitter and/ Facebook will be utilised to post IEC and event related information with appropriate tagging	IEC content on air pollution provided by NCDC will be utilized Districts will also create their own content as per the language and vulnerable group's requirements

In accordance with the IEC strategy, the state plans to implement the following IEC dissemination strategy over the period of next 5 years:

IEC content	Priority Districts	Dissemination plan for 5 years	Time line
Posters	Angul, Sundergarh, Khordha Cuttack, Balasore	2 posters for healthcare facilities in all districts	2022-24
	Rest 25 districts		2024-27

b. Public health advisories on air pollution and human health:

Health advisories will be issued to alert population of the potential harmful impacts of impending environmental phenomena like elevated air pollution. Advisories issued at the central level will also be forwarded to districts for public dissemination with locally understandable language.

c. Observation of Special Days

Day	Key activity
International Day of Clean Air for Blue Skies (September 7)	State, district and sub-district will arrange: Targeted awareness sessions: traffic police, schools, women, children Street plays and local cultural activities, Rallies Sports events Health facility based plantation Local radio/broadcasting program School functions and rallies with posters by the

	students
World Car Free Day (September 22)	
World Environmental Health Day (September 26)	

B. Capacity Building

To strengthen the capacity of the healthcare system to adapt/address illnesses/ diseases due to impacts of air pollution, the training plan of the state is as follows:

a. Knowledge building workshop

Each year the state will plan to organize a sensitization cum knowledge building workshop to take update on various air pollution related health issues from district officials, medical officers, and academic institutions working on climate change impact and air pollution and technical organizations who are innovating solutions.

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

Training on air pollution and its health impact and ARI surveillance reporting will be conducted with following target groups:

1. Medical officers
2. Community health workers
3. PRI leaders
4. Vulnerable groups about their health risk and safety measures
    a. Women and children on indoor air pollution
    b. Traffic police and construction workers

Training of all the District Nodal Officers will be conducted at the beginning of the training calendar

NPCCHH Training Plan at the State Level

Training Programmes	Trainer	Participants	Training Content
Training of the trainers (2 days)	SNO/Consultant/experts	DNO/state officials	Air pollution, related health impacts and surveillance
Medical Officers (3 days)	DNO/Consultant	MO (DH, CHC, PHC)	
Community Health Care Workers (HWC) (2 days)	MO (DH, CHC, PHC)	Community Health Workers (MPHW, ANM, ASHA)	
Panchayati Raj Institutions (1 day)	MO/ANM	Panchayat Pradhan and other elected members	
Vulnerable groups	ASHA/ANM/MO	Women and children Traffic police, construction workers	

Schedule plan for training for 5 years 22-27

Sl. no	Training programme	Time of the year	Target	Priority Districts

1	DNO	September	100%	Prioritization will be done on the basis of severity of AQ data received from SPCB
2	MO	September to October	100%	
3	Community Health Workers	October-November	100%	
4	PRI member	November	100%	
5	Vulnerable community	November	100% of the selected members	

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 observance of important environment-health days • Organize training sessions for district level and surveillance nodal officer • Facilitate training of medical officers in the clinical aspects of air pollution'shealth 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 report of activities • Review implementation of IEC and surveillance activities at all levels • Evaluate and update relevant section 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 withhigh AQI • Create organization support and strengthen Environmental Health cell to implement NPCCHH vision, goal, and objectives • Organize sensitization workshops for other stakeholders and linedepartments • Organize seminars on Air Pollution and conferences to share knowledge andaction under NPCCHH. • Collaborate with academic institute/s for support in updating SAPCCHH

	• Surveillance activity monitoring, vulnerability assessment, and appliedresearch • Advocate for reduction in the source of air pollution
DNO	• Ensure IEC dissemination to the community level • Facilitate community level IEC activities • Organize training for Block Health Officers, Medical officer, Sentinel hospital nodal officers with relevant training manuals • Organize training of vulnerable groups: police officers, outdoor works,women, children • Organize IEC campaigns at the district level on observance of importantenvironment-health days • Collect and monitor AQI levels in states especially in the hotspots and NCAP cities • Ensure daily reporting from Sentinel hospitals and compile the data • Analyze daily health data with AQI level to monitor trends • Submit analyzed monthly report to SNO, NPCCHH Headquarter, and other departments for necessary action • Submit report of activities • Update DAPCCHH with support from District Task Force • Advocate for reduction in the source of air pollution
Surveillancehospital nodal officer	• Train hospital staff and clinician responsible for daily reporting in caseindentation and reporting flow • Compile daily reports for the health facility and submit it to DNO and NPCCHH Headquarter
Black health officer	• Conduct community level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshops and training for vulnerable groups
Medicalofficer	• Conduct health facility-based IEC activities • Support community level IEC activities • Be aware of AQI levels and health impact of air pollution • Ensure necessary health facility preparedness in early diagnosis andmanagement of cases
PanchayatiRaj Institutions	Conduct community level IEC activities

C. Surveillance on Acute Respiratory Illness (ARI)

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

a. Activities conducted for strengthening of surveillance

1. Community level vulnerability analysis for district wise ARI disease burden
2. Installment of Air quality monitor for all the sentinel hospitals
3. Tracking morbidity and mortality due to air pollution through surveillance

mechanism guided by NAPCCHH

Talcher, Bhubaneswar, Cuttack, Angul, Rourkela, and Balasore are the cities selected for ARI surveillance.

City wise List of Sentinel hospitals selected for ARI surveillance activity

Name of City	Name of Hospital	Public or Private	Type of Hospital (Medical College, District Hosp, Rural Hosp, Pediatric Hosp, Respiratory Disease Hospital)	Name of Nodal (reporting)Officer of hospital	Name of Nodal (reporting) Officer of hospital
Talcher	Nehur Shatabdi Central Hospital	Private	Hospital	Dr. Ashok Kumar Jena	9438879913
Angul	DHH	Public	District Hospital	Dr. Dillip Kumar Pattanaik	9439981252
Rourkela	RGH	Public	Hospital	Dr. Kanhu Charan Naik	9439999166
Rourkela	IGH	Private	Hospital	Dr. Arun Mukti Minz	8895500749
Balasore	Fakir Mohan, MCH	Public	Hospital (Medical College)	Dr. Akshya Kumar Sethy	9853354930
Balasore	DHH	Public	District Hosp	Dr. S.S. Choudhwary	9439989803
Cuttack	SCB, MCH	Public	Medical College	Dr. Sikata Nanda	9437740042
Cuttack	Ashwini Hospital	Private	Urban	Dr. Priyadarshi Tripathy	9861511665
BBSR	AIIMS	Public	Medical College	Dr. Binod Kumar Patra	9438884013
BBSR	KIMS	Private	Medical College	Dr. Alpana Mishra	9437940418
BBSR	Hitech	Private	Medical College	Dr. Debi Kalyan Mishra	9937602092
BBSR	Capital Hospital	Public	Urban Hospital	Dr. Sudam Chandra Sahu	9438233599
Kalinganagar Jajpur	TATA medical hospital	private			

Table 5 Timeline for the activities

Activity	Timeline
Community level vulnerability analysis for district wise ARI disease burden	October to December 2022
Installment of Air quality monitor for all the sentinel hospitals	2022-2024
Tracking morbidity and mortality due to air pollution through surveillance mechanism guided by NAPCCHH	2022-2027

b. Health Adaptation plan for Heat-related illnesses

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

a) Based on Departure from the Normal

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

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

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

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

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

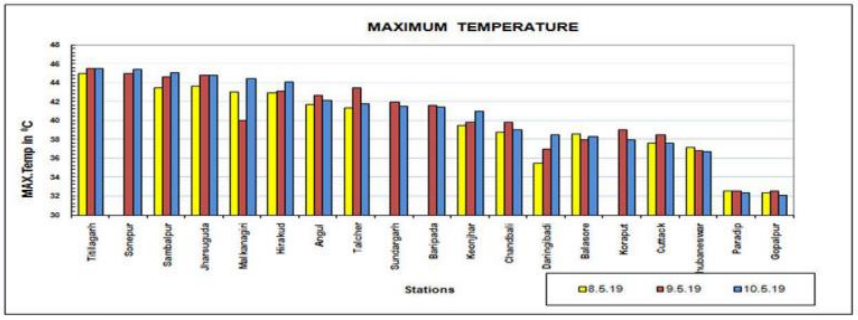
National Disaster Management Authority (NDMA) prepared Guidelines for the Preparation of Action Plan-prevention and management of heat wave in 2017, wherein the roles and responsibilities of various agencies were identified. Emergency Medical Relief (EMR), Ministry of Health and Family Welfare prepared detailed guidelines on the prevention and management of heat-related illnesses in 2015 wherein patho-physiology, risk factors, clinical manifestations, management, prevention, and public health action plan for managing heat-related illnesses has been explained.

Heat wave situation in Odisha

In the year 1998, Odisha state faced an unprecedented heat wave condition, as a result of which about 2042 persons lost their lives. Though extensive awareness campaigns have largely reduced the numbers of deaths during and post 1998 period, still causalities are being reported each year due to Heat Stress Disorders across different districts. The state experiences heat wave conditions between April to June months causing insurmountable human suffering. Farmers, workers, labourers, and travellers mostly suffer from the heat stress disorders, as they have increased exposure to high atmospheric temperature. During 2020, 7 heat stroke-related deaths were reported in Odisha. Therefore, preplanned preventive measures to reduce the cases and the deaths need to be undertaken at the district and the sub district levels.

1.05.2019
Heat Condition over Odisha

Sl. No.	Station	Maximum Temperature (°C)	Relative Humidity (%) at 17.30	Sl. No.	Station	Maximum Temperature (°C)	Relative Humidity (%) at 17.30
1	Titilagarh	45.5	19	13	Daringibadi	38.5	68
2	Sonepur	45.4	23	14	Balasore	38.3	80
3	Sambalpur	45.1	29	15	Koraput	38.0	36
4	Jharsuguda	44.8	13	16	Cuttack	37.6	72
5	Malkanagiri	44.4	34	17	Bhubaneswar	36.7	75
6	Hirakud	44.1	22	18	Paradip	32.4	89
7	Angul	42.1	52	19	Gopalpur	32.1	84
8	Talcher	41.8	36				
9	Sundargarh	41.5	63				
10	Baripada	41.4	72				
11	Keonjhar	41.0	38				
12	Chandbali	39.0	66				



Observations:
- Slight variation in max temperature in most of the stations.
- Eleven stations have crossed 40°C of the max temp.

Forecast:
- Maximum temperature (day temperature) likely to be above normal by 3-5°c over the districts of interior Odisha and 2-3°c above normal over the districts of coastal Odisha during next 2-3 days.
- Light rain or thunder-shower likely to occur at one or two places over the districts of Nawarangpur, Malkangiri, Koraput, Nuapada, Bargarh, Sambalpur, Jharsuguda, Sundargarh, Keonjhar, Deogarh, Mayurbhanj, Balasore, Bolangir, Sonepur and dry weather likely to prevail over the rest districts of Odisha.

Data Source: IMD, Bhubaneswar

GIS Cell, OSDMA

Table 6 Heat prone districts of Odisha

Bolangir	Sudergarh	Angul
Bhubaneswar	Kalahandi	Sambalpur
Cuttack	Rayagada	Gajapati
Khordha		

A. Awareness Generation

Awareness generation is essential to increase the general awareness amongst all the relevant stakeholders including the general population especially the vulnerable communities, healthcare providers, and policy makers regarding the impacts of heat on human health and ways to address them.

a. IEC Campaign

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

The content for 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 (Odia) and the role of the districts is to utilize these materials and disseminate at all levels.

S. No.	IEC Content	Priority Districts	Dissemination plan	Timeline

1.	Posters	All 30 districts	1 Poster for Heath care facilities in all districts	March to May
2.	Audio		Social Media (Facebook, Instagram, etc.)	March to May
3.	Videos			
4.	GIF's			
5.	Public Health Advisories		1 Health advisories to allthe healthcare facilities	March to May

b. Public Health Advisories

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

B. Capacity Building

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

- Training will be conducted with training materials and resources shared by NPCCHH and the NCDC website
- Training on Heat and HRI surveillance will be conducted by the districts from March to April 2022.
- One-day refresher training will be conducted every year in March, either face- to-face or online

Training details on the various health impacts of heat is as follows-

Table 7 NAPCCHH training plan at the district level

Training Programme	Trainer	Participants	Training Content
Medical Officers (3 Days)	DNO	MO (DH, CHC, PHC)	Managing Heat related illness Preparedness and planning for heat waves in the health facility
Community Health Care Workers (HWC) (2 Days)	MO	Community Health Workers (MPHW, ASHA)	
Panchayati Raj Institutions (1 Day)	MO, MLHP	Panchayati Raj Institutions, communities	

Schedule plan for training

Training	Timeline	Target	Priority Districts
DNO	February	100%	All 30 Districts
MO	March	100%	
Community Health worker	March	100%	
PRI	April-May	100%	

c. Sensitization/ knowledge building workshops

Each year the state will plan to organize a sensitization cum knowledge building workshop/refresher training to take an update on various heat-related health issues from the district officials, medical officers, academic institutions working on climate change impact and heat management and technical organizations.**Roles and responsibilities:**

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

Particulars	**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 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-healthimpacts • Ensure daily surveillance reporting from the district level • Ensure submission and analysis of heat-related deaths at the state and districtlevel • 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 manageHRI • Identify health facilities at the different levels that can have heat illness wards with necessary treatment/cooling facilities • Keep the existing Rapid Response Teams under IDSP prepared to manage HRI if needed for emergency response to extreme heat • Review implementation of the IEC and surveillance activities at all levels • Evaluate and update relevant sections of SAPCCHH with support from the StateTask Force • Create organizational support and the strengthen Environmental Health cell to implement NPCCHH vision, goal, and objectives • Organize sensitization workshops for other stakeholders and linedepartments • Organize seminars and conferences to share knowledge and action underNPCCHH.
	• 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 reduction in the source of greenhouse gas emissions

DNO	• Disseminate early warning to the block and health facility level • Ensure IEC dissemination to community level and facilitate communitylevel IEC activities • Liaison with IMD to receive daily observed temperature and relative humidity information • Liaison with the 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 i.e., police officers, outdoor workers, women, children etc. • Organize IEC campaigns at the district level on 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 monitortrends and hotspots in the district • Support timely suspected heatstroke death analysis and its reporting • Submit analyzed weekly report to SNO, NPCCHH, Hq, and otherdepartments for necessary action • Coordinate with other agencies for response • Update DAPCCHH with support from the District Task Force • Submit report of activities on heat-health under NPCCHH • Advocate for reduction in the source of greenhouse gas emissions
Block Health Officer	• Conduct community level IEC activities • Ensure training of medical officers • Organize PRI sensitization workshop and training for vulnerable groups • Implement heat mitigation efforts
City Health Departm ent	• Support in development and implementation of city-specific heat-healthaction plan
Medical Officer	• Conduct health facility-based IEC activities • Support community level IEC activities • Be aware of AQI levels and health impact of air pollution • Ensure necessary health facility preparedness in early diagnosis andmanagement of cases
Panchayati Raj Institutions	• Conduct community level IEC activities

C. Surveillance on heat related illnesses

Daily Heat related illnesses surveillance reporting under NPCCHH in Odisha started form 1st April 2022 from all the district health facilities from Primary Health center and above from 1st April 2022 to 31st July 2022.

Roles and responsibilities of the health department, medical colleges and hospitals, and health centres and line workers

Department	Season	Roles and responsibilities
Health department	During **Pre-Heat** Season	• Create a list of high-risk areas (heat-wise) of districts/block/cities

	(annually from January through March)	• Update surveillance protocols and programs, including to track daily heat-related data • Develop/revise and translate IEC in local language • Make a communication plan for dissemination of heat-related alerts or education materials • Check inventories of medical supplies in health centers • Identify cooling centers and barriers to access cooling centers • Capacity building of health care personnel to detect and treat heat-related illnesses • Community involvement for workers and trainers' education • Issue health advisory to healthcare personnel based on IMD seasonal prediction or warning • Reassess 'Occupational Health Standards' for various types of Occupation • Ensure inter-sectoral convergence and coordination for improving architecture, design, energy efficient cooling and heating facility, increase in plantation i.e. Climate Resilient Green Building Design.
	During **Heat** Season (annually from March through July)	• Ensure real-time surveillance and monitoring system in case of extreme event. • Prepare rapid response team • Distribute "Dos and Don'ts" to community • Effectively send a "Don't Panic!" message to community • Ensure access to Medical Mobile Van in the Red Zone • Ensure additional medical vans available • Ensure strict implementation of legislative/regulatory actions as per Occupational Health Standards. • Coordination with meteorological department for analysing cases and death data with meteorological

		variables like maximum temperature and relative humidity
	During **Post-Heat** Season (annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
Medical College and Hospitals	During **Pre-Heat** Season (annually from January through March)	• Adopt heat-focused examination materials • Get additional hospitals and ambulances ready • Update surveillance protocols and programs, including to track daily heat-related data • Establish more clinician education • Continue to train medical officers and paramedics
	During **Heat** Season (annually from March through July)	• Adopt heat-illness related treatment and prevention protocols • Equip hospitals with additional materials • Deploy all medical staff to be on duty • Keep emergency ward ready • Keep stock of small reusable ice packs to apply to PULSE areas • Report heat stroke patients to DSU daily • Expedite recording of cause of death due to heat related illnesses
	During **Post-Heat** Season (annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan
For health centres and link workers	During **Pre-Heat** Season (Annually from January through March)	• Distribute pamphlets and other materials to the community • Sensitize line workers and community leaders • Develop and execute school health program • Dissemination of materials in slum communities • Coordinate outreach efforts with other community groups, non-profits, and higher education
	During **Heat** Season (Annually from March through	• Recheck management stock • Modify worker hours to avoid heat of the day • Visit at-risk populations for monitoring

	July)	and prevention • Communicate information on tertiary care and 108 service
	During **Post-Heat** Season (Annually from July through September)	• Participate in annual evaluation of heat action plan • Review revised heat action plan

Health Adaptation Plan for Vector-Borne Diseases

The effect of climate variations has been well established for illnesses which are spread through vectors or which are transmitted from animals to humans. Scientific evidence establishes the fact that the impacts of climate change are having wide, immediate, as well as long-term indirect effects on public health. Especially the focus is on climate change impacts in terms of increased severity, frequency, and the spread of vector-borne diseases.
Odisha, an eastern coastal state of India, is not an exception in experiencing the effects of climate change in the spread of vector-borne diseases. Malaria is one of the most common and widely distributed vector-borne diseases observed in Odisha. Transmission of malaria is a dynamic process influenced by the changes in ecological and meteorological conditions. The other vector-borne diseases observed in Odisha since the last decade include dengue, Japanese encephalitis, and chikungunya.

Vulnerable districts of Odisha

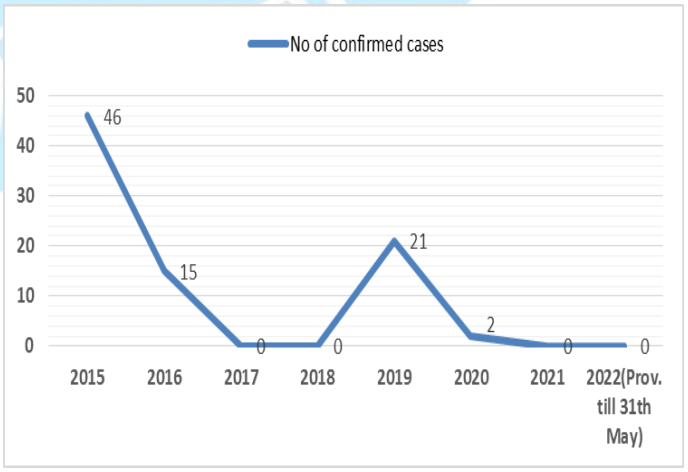
Malkangiri	Raygada	Kalahandi
Koraput	Bolangir	Sambalpur
Sundergarh	Keonjhar	Mayurbhanj
Sonepur	Jagathsinghpur	Jaipur

NVBDCP Odisha

National Vector Borne Disease Control Programme (NVBDCP) is an umbrella programme for prevention and control of six vector-borne diseases, namely malaria, dengue, chikungunya, Japanese encephalitis, filariasis, and kala azar. Factors contributing to the increase/ decrease of vector-borne diseases in the Odisha state-

1. Disasters like flood and cyclone
2. Rain fall
3. High Temperature
4. Higher concentration of tribal population in some districts
5. Districts which are difficult to reach due to their forest cover and get cut-off seasonally due to weather patterns

Year wise decrease in malaria cases



However, there has been a decrease in malaria cases, after the implementation of DAMAN (Durgama Anchalare Malaria Nirakarana) i.e., Malaria Elimination in Remote Areas in 2017. DAMaN" is a state- specific special intervention for inaccessible areas facilitating mass screening of population for malaria and screening of vulnerable population for nutritional parameters. DAMAN activities are carried out three times a year, in 23 districts of Odisha to address malaria and malnutrition.

Adaptation strategy and action plan for Vector-Borne diseases

1. Protective measures and greater community mobilization through existing program network.
2. Increased technical capacity of the health and allied actors.
3. Increased health infrastructure
4. Strengthened monitoring and Surveillance systems.
5. Case Management, Lab diagnosis, and clinical management, especially in remote districts.
6. Vector management, environmental management for source reduction, chemical control, personal protection, and legislation.

A. Awareness generation

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

a. IEC Campaign

The districts are aimed to create awareness through Information, Education, and Communication Activities (IEC) by the development of locally and culturally acceptable messages through posters, audio, video, organizing public health events, and issuing advisories related to vector-borne diseases.

The content for the IEC for vector-borne diseases will be provided by the NPCCHH division. The state will translate the content into the local or regional language (Odia and local tribal languages) and the role of the districts is to utilize these materials and disseminate at all the levels.

The IEC dissemination plan for vector-borne diseases is listed below. The activities will be conducted from June to August every year and after extreme weather events like floods and cyclones.

Dissemination Plan:

IEC type	Material	Timeline	Mechanism
Posters	Posters on VBD and climate change Adopt posters made by state NVBDC Posters on VBD and climate change	After extreme weather events i.e. floods, cyclone Collaborate with NVBDCP	Collaborate withNVBDCP
Wall painting		After extreme weather events i.e. floods, cyclone Collaborate with NVBDCP	In schools and educational institutes
Hoardings	Posters or digital display board	After extreme weather events i.e. floods, cyclone, Collaborate with NVBDCP	To be planned with hotspot Municipalities and Districts
Social Media	All the above material +relevant activity updates	After extreme weather events i.e. floods, cyclone Collaborate with NVBDCP	Facebook and Twitter handle of state IDSP,NHM WhatsApp groups (State DNO, Health facility group)

B. Capacity building

To strengthen the capacity of healthcare system to adapt/address vector-borne diseases due to climate change.

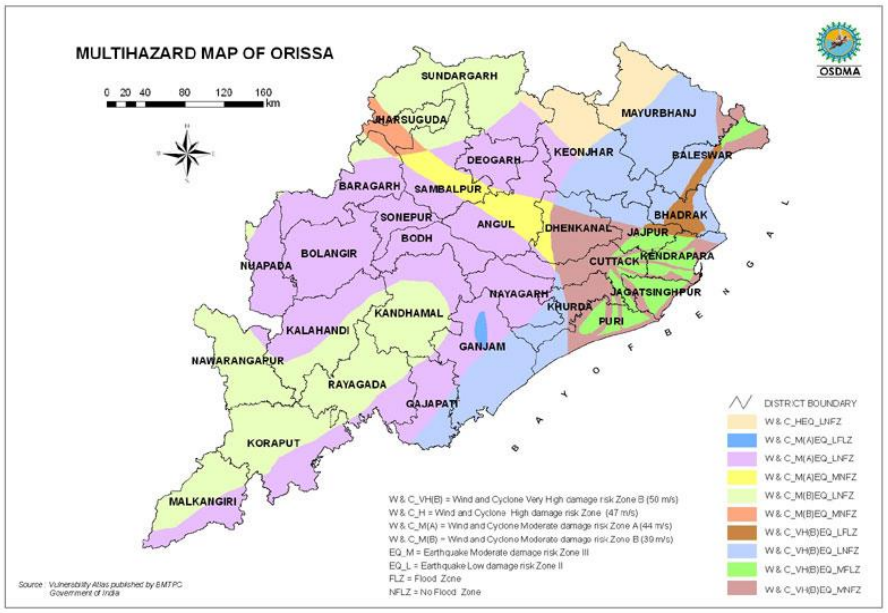
i) Training will be conducted with the materials and resources shared by NPCCHH and NCDC website
ii) Training calendar of the State has been proposed for months of April to June each year
iii) Refresher training to be conducted in April each year

Training plan			
Training Programme	**Trainer**	**Participants**	**Training content**
Medical officers (3 days)	District Level Trainers DNO-CC	MO (DH/CHC/PHC)	Climate change and VBD
Community Health care workers (HCW) (2 days)	District Level Trainers, MO	Community Health Workers (MPW, ASHA)	
Panchayati Raj Institutions (1day)	District level trainers, MO, Health care workers	Panchayati Raj Institutions, communities	

C. Surveillance of VBD

1. Mapping of districts and vulnerable population
2. Integrate existing programs with upcoming digital platform of NAPCCHH and NCDC

Health adaptation plan for Disaster management



Odisha's geographic location on the east coast of India and its climatic condition has meant that the state has historically been highly prone to climate change and multiple hazards, mainly cyclones, droughts, and floods. Changing climatic conditions is likely to increase the intensity and frequency of natural disasters. Population growth is leading to the intensification of human settlements in vulnerable areas with an increasingly urban population in the state that poses challenges to the disaster management mechanism in the state. In the recent past, increasing numbers of death tolls due to lightning, heat waves, and road accidents have been a major concern. The fluctuating weather conditions suggest that Odisha is stumbling under a climatic chaos. The state has been declared disaster-affected. From the 95 years of the last 105 years, floods have

occurred for 50 years, droughts for 32 years, and cyclones have struck the state for 11 years. Odisha, due to its sub-tropical location is vulnerable to various natural disasters like:

- Tropical cyclones
- Floods
- Storm surges
- Lightning
- Tsunami
- Droughts
- Whirlwinds

Amongst the natural disasters, Odisha is particularly vulnerable for tropical cyclones and floods.

According to the IPCC Fifth Assessment Report, the frequency and intensity of tropical cyclones in Odisha are likely to rise. Even past data compiled by the United Nations Office for Disaster Risk Reduction (UNISDR) reveals that from 1970 to 2010, the Asia-Pacific population living in cyclone-prone areas increased from 71.8 million to 120.7 million, expanding the magnitude of vulnerability to disasters.

Odisha did improve its disaster profile with 'zero causality' since the last decade and super cyclone 'Fani' in 2019 was the latest example of the same. To address the disaster situation, Odisha State Disaster Mitigation Authority (OSDMA) was established by the Government of Odisha as an autonomous organization established on 28th December 1999. The Authority has the mandate to not only to take up the mitigation activities but also the relief, restoration, reconstruction, and other measures.

Causes of different diseases prevalent during disaster:

1. Scarcity of drinking water
2. Unhygienic environment
3. Scarcity of essential commodities (food, water, etc.)

Priority Districts for diseases prevalent during disasters in the state		
Puri	Cuttack	Khordha
Jagatsinghpur	Ganjam	Gajapati
Jajpur	Bhadrak	Kendrapara
Mayurbhnaj	Balasore	

Districts with major outbreaks

Type of Outbreaks	**Affected Districts**
Acute Diarrhoeal Diseases	Angul, Ganjam, Dhenkanal, Kalahandi, Nuapada, Nabarangapur, and Baragarh
Hepatitis	Khurda, Jagatsinghpur, Sonepur, Bolangir, Nayagarh and Baragarh
Measles	Nawarangapur, Koraput, Rayagada, Mayurbhanja, Ganjam, and Deogarh
Swine Flu	Angul, Jagatsinghpur
Anthrax	Koraput, Malkangiri

The State approach for disaster-related health prevention and mitigation is multi-hazard

based as it isvulnerable to all the major natural hazards such as earthquake, flood, cyclone, high speed wind, thunderstorm, hailstorm, lighting, forest fire, etc. There are several prevention/mitigation activities which will be common for natural hazards. The same are describe in table below:

Sl. No	Task	Activities	Responsibility
		Structural measures	
1	Land use planning	Land use planning of the State in view ofhazard, risk and vulnerability of the State	Dept. of Land Management; Dept. of Town Planning; BMC Line Dept; DistrictAdministration
		To ensure development schemes of the State are undertaken in view of hazard, risk, vulnerability and micro-zonation	Dept. of State Planning, Dept. of Land Management, Dept. of Town Planning, Line Dept. District Administration
2	Mainstreaming Disaster Management in	Ensure that each development programme /scheme in the State should be sanctioned/undertaken only if it meets	Dept. of State Planning;Dept. of Finance; All
	development programmes	the requirement of disaster management	Dept.; SDMA and District Administration.
		Ensure the programme/ scheme/ project is facilitated with the provision for adequate funds of disaster management	
3	Adoption of new technology	Application of Science and technologyand engineering inputs to improve infrastructures including dams and reservoirs, building design, construction, etc.	Dept. of Science and Technology; SRSAC; SDMA; CWC; IMD; IT & E-governance; GSI; All Line Dept./Agencies; District Administration.
4	Techno-Legal Regime	Review and revision of building by laws. Review and revision of GDCR/CRZ etc. Review and revision of town planningAct & Rules. Ensure strict implementation of Code andRules. Monitoring of quality construction.	Dept. of Town Planning; Dept. of UD & Housing; RD & Panchayat; ULBs&PRIs; SDMA; Line Deptt.District Administration.
5	Safety Audit	Carrying out structural safety audit of allcritical lifeline structures.	SDMA; Dept. of Town Planning; Dept. of UD & Housing; All Line Dept. District Administration
6	Capacity Building	Construction/Strengthening of SEOC/DEOC.	SDMA; Dept. of DM;DDMA; District Administration; ATI/ SIRD/ All Line Dept./Agencies
		Non-Structural Measures	

1	Planning	Prepare Multi Hazard Disaster Management Plan. Prepare hazard wise contingency planning. Ensure hazard wise Departmental Disaster Management Plan and Standard Operation Procedure (SOP). Conduct mock drills at regular intervals. Update the plan as per the requirement, Monitor similar activities at district & block level.	SDMA/ SEC; Dept. of Home; Dept. of DM; All Dept; ULBs/PRIs; DDMA / District Administration.
2	Capacity Building	Develop multi-hazard IEC material forPublication & Distribution. Media campaign for awarenessgeneration in general public. Organize training programmes, seminarsand workshops. Include disaster related topics incurriculum. Encourage disaster insurance. Encourage favourable taxation/incentive.	SDMA/SEC; Dept. of DM; All Dept; DDMA/ District Administration
3	Community based Disaster Management	Strengthening capacity of local self-government entities to understand local vulnerability and risk, disaster prevention needs, preparedness and response capabilities through participatory approach	SDMA; Dept. of DMDDMA/ District Administration; PRIs/ ULBs

Activities planned for awareness generation on the health impacts of diseases prevalent during disasters in the state

i. **Target population**:

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

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

IEC type	Material	Timeline	Mechanism
Advisor y	From OSDMA and NAPCCHH	Seasonal	By email to DNO for further dissemination to health facilities
Early warning	Bulletins/ advisory byIMD (storm, cyclone, flood) sent by NPCCHH and OSDMA	Seasonal	Health department/other government website/application • Digital display of temperatures/cyclone alert in public places and health facilities
Posters	6 posters on various EWS and health impacts Posters on heat and health impacts Poster on health hazards aftermath of cyclone/floods Posters on Do's and Don'ts regarding health and hygiene during disasters	Seasonal ,as needed	• Printing of copies for state- level dissemination at healthfacilities, public places/buildings • By email to DNO for printingat district level and dissemination to health facilities, schools and other public/government buildings
Wall painting	Using available material on health	Painted in July-Septemb er	In schools and educational institutions In health facilities

	impacts of heat, cyclone, and flood		
Hoardings/ digital board	Posters (above)	Seasonal ,as needed	To be planned with Municipalities
Digital display	• 5 GIF • video messages	Seasonal , as needed	Display in health facilities Public digital display boards inmajor cities
Social medial	All above material + relevant activity updates	Seasonal ,as needed	• Facebook and Twitter handle of state IDSP, NHM • WhatsApp groups (State DNO, Health facility group)

iii)Observance of important days

Day	Activities on Disaster-Health
• 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 assessment of disaster vulnerability/energy/ water conservation measures • Review of implementation of climate-resilient measures

B. Capacity building:

i) Target audience

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

ii) Training resources

- NPCCHH channel https://bit.ly/NPCCHHyt

Training Programme for	Trainer	Topics	Timeline
District level (DNO-CC, trainers)	State Level Trainers SNO-CC, Consultant	- Climate change and impact of extremeweather events in India - Formation of disaster managementcommittees and plans - Health facility vulnerability, resilient measures and disaster preparedness - Disaster response in coordination withdistrict disaster management authority - Post-disaster health impact assessmentand response	February
Health facility level (MO of DH/CHC/PHC)	District Level Trainers DNO-CC	- Health facility disaster vulnerability assessment - Disaster management committee plan - Climate resiliency measures (structural/functional) - Health facility preparedness for disaster response - Post-disaster surveillance and damage assessment	February
Community Health care workers (MPH, ASHA, ANM etc)	District Level Trainers, MO	- Climate change and health impact of extreme weather events - Disaster planning and response	**February-March**
Panchayati Raj Institutions	District level trainers, MO, Health care workers	- Climate change and health impact of extreme weather events - Disaster planning and response with community participation	**February-April**

C. Surveillance

1. Maintenance of disaster related injury/morbidity records in PHC/CHC level
2. Follow-up up to one month after a disaster of the households of a given region to check morbidity and nutritional impacts by front line health workers

3. Special monitoring of nutritional and illness for under five children through AWW up to three months of a disaster

Roles and Responsibilities

Health sector	• Develop/ adapt health micro- plans for extreme weather events based on meteorology warnings and changes in the trend of illnesses in recent years. • Map vulnerable populations based on demography, land cover, water bodies, potential exposure, available resources health insurance coverage, andburden of chronic illnesses in the community. • Develop or translate IEC in the local language, and makea communication plan for the dissemination of health-related alerts/ education materials for the target or general population. • Build capacity of health care personnel to detect and treat illnesses associated with extreme weather events • Issue health advisory to healthcare personnel based on IMD seasonal prediction orwarning • Ensure health-related Real-time Surveillance and Monitoring System in case of extreme event • Explore collaborative mechanisms (e.g., memoranda of understanding) with other departments, stakeholders, suchas meteorological, pollution control board, etc for sharing data and for coordinating effortsto manage health risks • Ensure strict implementation of legislative/ regulatory actions as per Occupational Health Standards.
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 implement of climate resilient measures in health facilities • Review implementation of IEC, training, 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 • 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 extreme weather events and health under

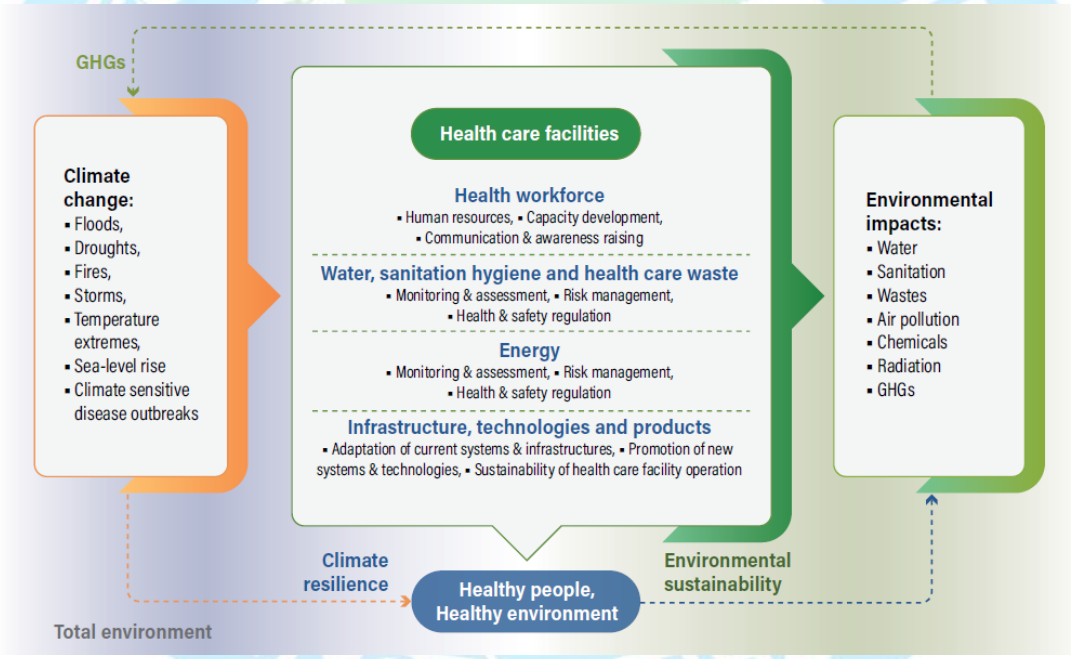
	NPCCHH
DNO	• Disseminate early warning to the block and health facility level • Ensure IEC dissemination to community level and facilitate community level IEC activities • Organize training for block health officers and MO • Formalize intersectoral coordination for disaster planning, management and response 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 & 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, medical officers, with relevant training manuals • Conduct sensitization of vulnerable groups: police officers, outdoor works, women, children, etc. • Organize IEC campaigns at district level on observance of important environment-health days • Facilitate disaster vulnerability assessments in health facilities and maintain records of such assessment and health facility damage due to extreme weather events • Update DAPCCHH with support from District Task Force • Submit reports of activities on EWE and health under NPCCHH
MO	• Conduct health facility-based IEC activities • Support community level IEC activities • Preparation of Disaster Management Plans and hospital safety plan • Assessment of health facility in context of climate change-extreme weather events • Identifying structural changes/retrofitting measures at the facility level to equip the healthcare facility • Ensuring routine monitoring and maintenance of support functions (Water quality, waste management) • Health facility preparedness for seasonal events. • Coordinate, plan ,and involve PRI before, during, and after extreme weather events

Health adaptation plan for green and climate resilient healthcare facilities

"Climate-resilient and environmentally sustainable health care facilities anticipate, respond to, cope with, recover from and adapt to climate-related shocks and stresses, while minimizing negative impacts on the environment and leveraging opportunities to restore and improve it, so as to bring ongoing and sustained health care to their target population and protect the health and well-being of future generations. (WHO)".

As the climate continues to change, risks to health systems and facilities – including hospitals, clinics, and community care centers – are increasing, reducing the ability of health professionals to protect people from a range of climate hazards. Health care facilities are the first and last line of defence to climate change impacts as they can be responsible for large emissions of greenhouse gases (GHGs), and because they provide the needed services and care to people harmed by extreme weather and other long-term climate hazards.

Figure: Framework for building climate-resilient and environmentally sustainable HCF.



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

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

1. Environmentally Sustainable (Green) Measures at Health Care Facilities
   - **a.** Energy Auditing
   - **b.** Installation of LED lighting at Health Care Facilities
   - **c.** Installation of Solar panels
   - **d.** Water Conservation Measures – Rain water Harvesting

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

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

a. Energy Auditing:

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

The guiding principles in this respect include:

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

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

The guiding principle in this respect would be:

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

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

The guiding principle in this area would be:

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

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

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

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

- The healthcare facility would develop a strategy for the optimum usage of water.
- The HCFs would develop a plan for the conservation of water. e.g., water- efficient fixtures, dual flush mechanism, sensor operated urinals, waterless urinals, rainwater harvesting

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

2. <u>Climate Resilient Infrastructure at Health Care Facilities including Retro Fitting of Existing Health Care Facilities</u>

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

New Buildings

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

Existing Infrastructure

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

Dissemination plan for IEC Materials

AWARENESS GENERATION

- Awareness and sensitization on Climate Change events on Heat wave, flooding, airpollution events, waste management.
- Sensitization workshop on Sustainable Procurement
- Awareness on energy efficient measures and water conservation measures

IEC type	Material	Dissemination Timeline	Targeteddistricts
Posters	2 Posters for Healthcare facilities in 6 Districts	November	30 districts
Wall painting			30 Districts
Audio-Visual			30 Districts

CAPACITY BUILDING

The plan for training of ToTs, DNO-CC and Medical officers on guidelines and operational framework of Green and Climate resilient measures in Health Care Facilities is mentioned in the table below:

S. No.	Activities	Priority Districts	Timeline
1.	Training of OTs	30 districts	November
2.	Training of DNO-CC		December
3.	Training of Medical Officers		December

IMPLEMENTATION PLAN

1. HEALTH SECTOR PREPAREDNESS FOR 5 YEARS 22-27

No	Particulars	Units cost	Units	Year-wise Budget					TOTAL	Remarks/Justification
				22-23	23-24	24-25	26-27	22-23		
1	**Infrastructure-Civil Works (I&C)**									
1.1	Old/ ongoing work			0	0	0	0	0	0	
1.2	New Work-Climate Resilient Health facilities	500,000	10	5,000,000	5,500,000	6,050,000	6,655,000	7,320,500	30,525,500	Each year 10 hospitals will be upgraded to climate resilient health facilities; health facilities will be prioritised based on vulnerability analysis report
2	**Others including operating costs(OOC)**									
2.1	Energy Audit	10,000	10	100,000	110,000	121,000	133,100	146,410	610,510	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
2.2	LED Lighting	2,000	10	20,000	22,000	24,200	26,620	29,282	122,102	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
2.3	Solar Panel	70,000	10	700,000	770,000	847,000	931,700	1,024,870	4,273,570	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
2.4	Rain water Harvesting System	70,000	10	700,000	770,000	847,000	931,700	1,024,870	4,273,570	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report

Roles and Responsibilities

The table below highlights the roles and responsibilities of the associated staff to help support green climate and resilience infrastructure development in order to strengthen healthcare infrastructure.

	Responsibilities
SNO	• Finalization of IEC material and dissemination plan • Organize training sessions for the district-level officers and trainers • Identify health facilities for priority implementation based on disasterand health facility vulnerability • Identify relevant state level nodal agencies and collaborate with them for assessment of health facilities for implementation of measures • Facilitate and monitor necessary assessments at the health facility level • Facilitate implementation of structural and functional measures at the health facility level • Monitor the implementation of the activities • Support districts to identify sources of funding • Advocate for reduction in source of greenhouse gas emissions
DNO	• Conduct training for block health officers, medical officers, with relevant training manuals • Support conduction for the following assessment at the health facility level - Energy audit - Water audit - Disaster-vulnerability assessment • Support the following functional measures at the health facility level - Water committee - Sustainable procurement committee - Operational measures to make health facilities function during the disasters or power cut • Coordinate with other agencies for assessment and implementation of identified structural and functional measures • Update DAPCCHH with support from District Task Force
Block health officer	• Ensure training of medical officers • Organize PRI sensitization workshop • Coordinate with other agencies for assessment and implementation of identified structural and functional measures

Medical officer	• Conduct health facility assessment - Energy audit - Water audit - Disaster-vulnerability assessment • Lead following functional measures - Water committee - Sustainable procurement committee - Operational measures to make health facility functioning during disastersor 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 sourceand community involvement

Part III

Budget for 5 years:

No	Particulars	Units cost	Units	Year-wise Budget					TOTAL	Remarks/Justification
				22-23	23-24	24-25	26-27	22-23		
1	**Infrastructure-Civil Works (I&C)**									
1.1	Old/ ongoing work			0	0	0	0	0	0	
1.2	New Work-Climate Resilient Health facilities	500,000	10	5,000,000	5,500,000	6,050,000	6,655,000	7,320,500	30,525,500	Each year 10 hospitals will be upgraded to climate resilient health facilities; health facilities will be prioritised based on vulnerability analysis report
2	**Capacity building incl. training**									
2.1	Training at State Level	1,000	20	20,000	22,000	24,200	26,620	29,282	122,102	Twenty (20) state level officers will be trained every year to plan, implement, monitor SAPPCCHH
2.2	Trainings of Medical Officers, Health Workers and Programme officers under SAPCCHH	500	8302	4,151,000	4,566,100	5,022,710	5,524,981	6,077,479	25,342,270	About 8302 health staff will be trained every year to plan, implement, monitor SAPPCCHH at their level
2.3	Sensitsation of high-school students	5,000	628	3,140,000	3,454,000	3,799,400	4,179,340	4,597,274	19,170,014	About 628 schools will be trained every year
3	**IEC & Printing**									

3.1	IEC on Climate Sensitive Diseases at Block, District and State level – Air pollution, Heat and other relevant Climate Sensitive diseases	2,000,000	1	2,000,000	2,200,000	2,420,000	2,662,000	2,928,200	12,210,200	Various IEC materials will be developed based on the need; The requirement will be identified from vulnerability analysis
3.2	Printing activities for SAPCCHH	2,000,000	1	2,000,000	2,200,000	2,420,000	2,662,000	2,928,200	12,210,200	Printing of IEC materials
4	**Others including operating costs(OOC)**									
4.1	Energy Audit	10,000	10	100,000	110,000	121,000	133,100	146,410	610,510	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
4.2	LED Lighting	2,000	10	20,000	22,000	24,200	26,620	29,282	122,102	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
4.3	Solar Panel	70,000	10	700,000	770,000	847,000	931,700	1,024,870	4,273,570	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
4.4	Rain water Harvesting System	70,000	10	700,000	770,000	847,000	931,700	1,024,870	4,273,570	Each year 10 hospitals will be upgraded to green health facilities; health facilities will be prioritised based on vulnerability analysis report
5	**Planning, M&E**									
5.1	Operational Cost	200,000	1	200,000	220,000	242,000	266,200	292,820	1,221,020	Expenses for operational costs

5.2	Task force Meeting to draft health sector plan for Heat, Air Pollution and Cyclone	4,000	12	48,000	52,800	58,080	63,888	70,277	293,045	Twelve member (Ten task force members and Two resource persons), 2-day meeting to develop plan; Unit cost at 2000 per day* 2days = 4000
5.3	Sensitization workshop/ Meeting of the District level Health Officers at District Level	500	600	300,000	330,000	363,000	399,300	439,230	1,831,530	Sensitization workshop expenses for 20 officers in 30 districts
6	**Surveillance, Research, Review and Evaluation (SRRE)**									
6.1	Vulnerability analysis	8,000,000	1	8,000,000	8,800,000	0	0	0	16,800,000	1. Heat-health disease burden of vulnerable population in each districts 2. Mapping of cyclone and flood prone health facilities in coastal districts 3. Air pollution diseases burden (indoor and outdoor) for vulnerable population in each districts 4. Vector borne disease burden in all susceptible districts 5. Vulnerability profile preparation for all the district
6.2	Surveillance related to Climate Change, Air Pollution and Heat related illness	50,000	1	50,000	55,000	60,500	66,550	73,205	305,255	The surveillance officers will be oriented about SAPPCCHH and involved to conduct surveillance
6.3	Mid-term and Final Evaluation of SAPPCCHH implementation	800,000	1	0	800,000	0	0	880,000	1,680,000	The surveillance officers will be oriented about SAPPCCHH and involved to conduct surveillance
	TOTAL			**26,429,000**	**29,871,900**	**22,299,090**	**24,528,999**	**27,861,899**	**130,990,888**	

Budget for Air pollution monitoring in all sentinel hospitals

Sl. No	Items	No. of units	Details of Units	Approximate Unit cost	Approximate Budget
1	IEC				
1.1	Hoarding (20ft.x10ft.) Fabric cotton, Multi colour	703	CHC-377, SDH-32, DHH-32, Strategic location (Market place @4, Municipality offie@1, DRDA @1, Bus stand @1 Railyway station @1)	3,000	2109000
1.2	Poster (44cmx56cm), Multicolour	33000	All HWC PHC@10, CHC@50, DHH@100	6	198000
1.3	Wall Painting (3ftx5ft), Multi colour	16092	All (@1) HWC PHC, CHC, SDH, DHH	1000	16092000
1.4	Leaflets (Paper-90 GSM art Paper, Multicolour)	200000	All SCs, PHC, CHC, DHH	1	200000
1.5	Sun Board (3ftx5ft), thickness-3MM sunboard, Printing process ecosulvant, Multicolour	320	All DHH	1000	320000
1.6	FAQ (Paper-90 GSM Art paper, Cover page-170 GSM Art paper, Pages-12nos.)	337002	ASHAs @2, GKS @5., ANM@1, PHC HWC @ 1	10	3370020

2	Training for District level (Zoom Platform) 3 hours (10.30am - 1.30pm)	615 persons for 30 districts including 5 city (Cuttack, Bhubaneswar, Raurkela, Sambalpur, Berhampur)	DPHO, ADPHO (DC), DTO, DPHCO, ADPHCO, UPHO@5, CPM@5, PHM@5, DPM, GKS Coordinator, ASHA Manager, DMRCH, DAM, Epidemiologist, Data Manger, Microbiologist, DEO@1, PRI@2, DWO@1, DRO@1, Home Dept. @1, F & E Deptt.@1,	150	92250
2.1	Trainingg for District level (Zoom Platform) 3 hours (10.30am - 1.30pm)	7417 persons per block SDH (SDMO-1, MO-6, HM-1, SN-2,) Block CHC (Superintendent-1, BPHO-1, MO-1 AYUSH MO-1, BPM-1, PHEO-1, MPHS-1, ANM-1, PHC (MO-1, AYUSH MO-1, ANM-1, MPHW-1 Other CHC (MO-1, SN-1, MPHS-1, Sub Center (ANM-1, ASHA-5, PRI-2, SHG-2)	SDH, CHC, Other CHC, PHC, SCs	100	741700
Total				**5,267**	**23,122,970**

Annexures:

1. List of the District Nodal Officer

Sl no	District	Name	Designation	Phone no	Email id
1	Angul	Dr. Dhiren Pradhan	ADPHO(DC)	9776168429	DSU ANGUL <dsuangul@gmail.com>
2	Balasore	Dr. Asutosh Pradhan	MO,DHO,	8984564206	DSU Balesore <dsubalasore@gmail.com>
3	Bargarh	Dr.Joyapal Senapati	ADPHO(DC)	9437322545	DSU BARAGARH <dsubaragarh@gmail.com>
4	Bhadrak	Dr. Bhavati Rout	DPHO	8093659383	DSU BHADRAK <dsubhadrak@gmail.com>
5	Balangir	Dr.Namita Mishra	ADPHO(DC)	9437185167	DSU BOLANGIR <dsubolangir@gmail.com>
6	Boudh	Dr.Ashok kumar Pradhan	Consultat & medicine	9437712777	DSU BOUDH <dsuboudh@gmail.com>
7	Cuttack	Dr.Lokanath Patra	ADPHO(DC)	9437128352	DSU CUTTACK <dsucuttack@gmail.com>
8	Deogarh	Dr.Bansidhara Patra	ADPHO(DC)	9438364178	DSU DEOGARH <dsudeogarh@gmail.com>
9	Dhenkanal	Dr.Guru Prasad Jena	ADPHO(DC)	8249124695	DSU DHENKANAL <dsudhenkanal@gmail.com>
10	Gajapati	Dr. Ananda Samantaray	ADPHO(DC)	##########	DSU GAJAPATI <dsugajapati@gmail.com>
11	Ganjam	Dr. Hara Mohan Panda	ADPHO(DC)	7681804944	DSU GANJAM <idspdsuganjam@gmail.com>
12	Jagatsinghpur	Dr.Rasmiranjan Pattanayak	ADPHO(DC)	9437280667	DSU JAGATSINGHPUR <dsujagatsinghpur@gmail.com>
13	jajapur	Dr. Ramesh Mallick	ADPHO(DC)	9437441508	DSU JAJPUR <dsujajpur@gmail.com>
14	Jharsuguda	Dr. Madhulita Sahu	ADPHO(DC)	9437648733	DSU JHARSUGUDA <dsujharsuguda@gmail.com>
15	Kalahandi	Dr. Rakesh ku Sahu	DPHO,ADPHO DC	9439980007	DSU KALAHANDI <dsukalahandi@gmail.com>
16	Kandhamal	Dr. Basanta Patra	ADPHO(DC)	9938053729	dsukandhamal@gmail.com
17	Kendrapada	Dr.Mirza Babarbaig	DPHO	9437351420	DSU KENDRAPARA <dsukendrapara@gmail.com>
18	Keonjhar	Dr. Ramakanta Munda	ADPHO(DC)	9438083560	DSU KEONJHAR <idspdsukeonjhar@gmail.com>
19	Khordha	Dr.Jitendra kumar Panda	ADPHO(DC)	9438604787	DSU KHURDA <dsukhorda@gmail.com>

20	Koraput	Dr.Prasanta ku Sahu	ADPHO(DC)	9439996738	DSU KORAPUT <dsukoraput@gmail.com>
21	Malkangir	Dr.Dhaneswar Mohapatra	ADPHO(DC)	9937395609	DSU MALKANAGIRI <dsumalkanagiri@gmail.com>
22	Mayurbhanj	Dr.Ghasinam Munmo	ADPHO(DC)	9439997933	DSU MAYURBHANJ <dsumayurbhanja@gmail.com>
23	Nawaranggpur	Dr. Malaya ku Tripathy	ADPHO(DC)	9439988787	DSU NAWARANGPUR <dsunawarangpur@gmail.com>
24	Nayagarh	DR.Nusudaalli khan	ADPHO(DC)	9937646209	DSU NAYAGARH <dsunayagarh@gmail.com>
25	Nuapada	Dr. Gopal Ch. Mallick	DPHO	9439989772	DSU NUAPADA <dsunuapada@gmail.com>
26	Puri	Dr.Santosh Tripathy	AD	9439994018	DSU PURI <dsupuri@gmail.com>
27	Rayagada	Dr. Mamali Choudhary	ADPHO(DC)	9437448747	DSU RAYAGADA <dsurayagada@gmail.com>
28	Sambalpur	Dr. Monaranjan Hati	ADPHO(DC)	8658003183	DSU SAMBALPUR <dsusambalpur@gmail.com>
29	Sonepur	Dr. Pramahansa Dura	ADPHO(TB),ADPHO(LCP)	9439579434	DSU SONEPUR <dsusonepur@gmail.com>
30	Sundargarh	Dr. Kahnu Charan Nayak	DPHO	9937233313	DSU SUNDERGARH <dsusundergarh@gmail.com>

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