Vulnerability to various hazards

Vulnerability to Heat Wave

Heat Wave is defined as a condition of increased atmospheric temperature that leads to physiological stress, which sometimes can claim human life. Quantitatively Heat Wave can be defined as any increase from the normal temperature to Heat Wave or Severe Heat Wave. If the maximum temperature of any place continues to be 45° C for consecutive two days, it is called as Heat Wave condition. Physiologically human body can tolerate environmental temperature of 37° C. Whenever the environmental temperature increases above 37° C., the human body starts gaining heat from the atmosphere. In the case of humidity being high along with high temperature, a person can suffer from heat stress disorders even with the temperature at 37° or 38° C.1Higher daily peak temperatures and longer, more intense Heat Waves are becoming increasingly frequent globally due to climate change and due to greenhouse effect. Extreme heat events already have a significant impact in India

Heat Wave Situation in Odisha

Climatic changes, decrease in tree cover, depletion of ground water resources and increase in day temperature especially during the months of May and June, have made majority of the districts of the State vulnerable to heat wave. In 1998, the State witnessed a severe heat wave, which claimed over 2,000 lives. Several districts also suffered from extreme scarcity of drinking water. The heat wave condition in Odisha is becoming increasingly prominent and regular. However, the main risk due to heat wave is heat stroke. After the large number of deaths in 1998, the main causal factor was identified as lack of awareness and not following certain do's and don'ts during heat wave conditions. Though extensive awareness campaigns has reduced large number of fatalities in post 1998, poor socioeconomic conditions, lack of enforcement and adoption of good working conditions during the summer months remain the main risks of heat wave.

Year wise number of deaths

Year	1999	2008	2000	2009	2001	2010	2002	2011	2003	2012	2015	2013	2014	2004	2005	2016
No of dearth due to heat wave	91	71	29	89	25	104	41	22	68	83	60	16	40	45	236	47

2006 21 2007 47

Vulnerability to Lightning:

Lightning has been the biggest killer in the State. During last 7 years lightning has taken 2408 lives more than any other natural disaster during the period. On an average it takes around 350 lives each year. Most deaths occur during the months from May to August (about 71%). High occurrence of deaths has been observed in Mayurbhanj, Ganjam, Keonjhar, Sundergarh, Cuttack, Balasore, Dhenkanal, Jajpur, Khordha and Nawarangpur districts. About one third of lightning deaths took place while working in paddy fields. In the year 2016 (July 31) during this period, 36 people were dead and 37 were injured due to lightning strikes in Odisha. During 2017 – 2018 too, it has happened exactly during the same period. 17 people were struck dead by lightning as a thunderstorm raged in the coastal districts of Kendrapada, Ganjam and Bhadrak and Bhubaneswar. From April 1 to June 23, Odisha had recorded 155 deaths due to lightning. Since last year, the State Government listed lightning as State-specific disaster enabling the victims to get Rs 4 lakh as compensation as per the Odisha Relief Code.

Minute particles are to be blamed for the increase in the number of thunderstorms hitting different parts of Odisha. The amount of aerosol has increased in the air, which is why lightning strikes are more frequent now- a -days. As thunderstorms are most common during the March- July period and are usually the most powerful in the afternoon, people - particularly those who work in open spaces -need to be aware of this and stay indoors for a couple of hours when a storm happens.

People in urban areas are vulnerable to lightning as most buildings do not have a lightning prevention system, even though it is mandatory under the Indian Building Code. Some old buildings have lightning rods or objects to divert lightning strikes, but most of the new buildings do not have such an arrangement. Moreover, the meteorological office should initiate very short-range weather forecasting using the 'now casting' method. People should get updates every hour when a thunderstorm occurs. The meteorological office has good radar coverage; they can use it for 'now casting' and help people stay safe.

The Government can play a strategic role, not only by planting palm trees across the State but also by increasing priority based budget on the disaster management including lightning strikes and the authorities have to provide thunderstorm forecasting and lightning information in time to the concerned community through the meteorological office and through the relevant private sectors by using lightning detection system.

Satellite TV channels must telecast documentaries and short films regarding the lightning strikes highlighting the dangers of lightning for human life and property, and what should be done during and after lightning strikes. Furthermore, more research-based activities are essential for reducing extreme vulnerabilities to lightning strikes in a poor State like Odisha.

Rising global temperatures over the last century are driving a range of changing weather phenomenon, including stronger tropical cyclones, thunderstorms, floods, droughts, and heat waves. The increased numbers of lightning strikes may be due to global warming. Scientists say warmer conditions associated with climate change are causing more water evaporation from the land and the ocean, increasing clouds and rainfall and the potential for lightning storms.

Some experts attribute the rise in fatal lightning strikes to the country's population growth and deforestation, which has led to disappearance of many tall trees that earlier would have acted as

shields against lightning strikes. Moreover, frequent use of metal farm equipment in open fields, using cell phone during the thunderstorms, standing near metal cell phone towers or electrical power towers, taking shelter under trees during electrical storms, and so on are also responsible for increase in lightning-related deaths in Odisha.

Stay off corded phones, computers, and other electrical equipment that put you in direct contact with electricity. Avoid plumbing, including sinks, baths, and faucets. Stay away from windows and doors, and stay off porches. Do not lie on concrete floors, and do not lean against concrete walls. And wait until 30 minutes after a storm passes before going outside because a charge can linger in the air.

Moreover, experts have suggested the following long-term and short-term plans to be safe from lightening:

- The Government should impose ban on cutting all kinds of tall trees in the villages and sub-urban areas.
- Initiatives should be taken to plant more and more tall trees like palm and coconuts.
- Creating awareness on the lightning safety by organizing trainings, seminars, etc., at the union level.
- Lightening safety guidelines should be included in the children's curriculum starting from the primary schools.
- Lightening safety measures should be publicized through television, radios, and theatres.
- Area-specific lightning forecast from the meteorological department can be disseminated by emails, websites, and mobile sms.
- Every building should install the lightning protection system to save it from mechanical destruction caused by lightning effects.
- Sports persons should avoid going for match practice or participating in sports during rain and thunderstorms which may result in death or lightning burns or other neurological problems at a later age.
- Better to avoid going out of a car when it's raining with thunderstorm. Car is a very safe place during lightening.

Lighting ng

Year	No of district affected	Death
2006	07	204
2007	08	351
2008	09	362

2009	10	214
2010	11	227
2011	12	353
2012	13	265
2014	15	309
2015	16	400

Gaps

- Lack of forecasting well in advance by meteorological department.
- Lack of awareness of the people
- Lack of enough preventive measures
- Lack technology to withstand

Vulnerability to Tsunami

A tsunami is a series of waves most commonly caused by violent movement of the sea floor. In any event, a huge mass of water is displaced, producing tsunami. Such fault movements are accompanied by earthquakes, which are sometimes referred to as “tsunamigenic earthquakes”. Most tsunamigenic earthquakes take place at the great ocean trenches, where the tectonic plates that make up the earth’s surface collide and are forced under each other. When the plates move gradually or in small thrust, only small earthquakes are produced; however, periodically in certain areas, the plates catch. The overall motion of the plates does not stop; only the motion beneath the trench becomes hung up. Such areas where the plates are hung up are known as “seismic gaps” for their lack of earthquakes. The movement at the sea floor leading to tsunami can be produced by earthquakes, landslides and volcanic eruptions. Most tsunamis, including almost all of those travelling across entire ocean basins with destructive force, are caused by submarine faulting associated with large earthquakes. These are produced when a block of the ocean floor is thrust upward, or suddenly drops, or when an inclined area of the seafloor is thrust upward or suddenly thrust sideways.

Odisha coast is vulnerable to tsunami. 328 villages covering 6 coastal districts located within 1.5 km of the coastline are identified as tsunami prone villages. Though there is no specific tsunami event in

the recent past, the disaster cannot be ruled out. As per the scientific study conducted by IIT, Kharagpur, the State may experience tsunami within 4 hour.

Vulnerability to Drowning

Water its Only Safe While You're Watching

Drowning is yet another important form of accidents. This is the sixth leading cause of accidental death for people of all ages and the second leading cause of death for children aged 1-14 years. Drowning is the sixth leading cause of accidental death for people of all ages and the second leading cause of death for children aged 1-14 years and from 15 to 25 years The fatality occurs when children, youth and people in general try to swim in the deep and wide river, take summer bath in the river taking deep into the river, take bath in the sea beach, take selfie in the river embankment with an awkward position, journey in the boat etc. Odisha has been witnessing death due to drowning every year. People do not die more out of natural calamities but drowning account human lives and livestock more.

Yet swimming can carry risks. A Centers for Disease Control and Prevention report released in May 2018 shows that between 2000 and 2014, more than 27,000 people got sick from contaminated pool, hot tub, or playground water. Eight died.

Along with the risk of disease, swimming comes with the risk of drowning, sunburn, and—very rarely—infection by a brain-eating amoeba.

Odisha claimed 191 human death due to drowning in 23 districts in the year 2015 and 2016 alone.

How to Prevent It

- Children, as well as people who can't swim or are weak swimmers, should be within an arm's reach of an adult in case something goes wrong. And even strong swimmers and adults shouldn't swim alone,
- Anyone watching over swimmers—parents, grandparents, babysitters, neighbours—should know how to perform CPR. (You can find a CPR certification class near you here.
- Weak swimmers or people who can't swim should wear a U.S. Coast Guard approved life jacket in or around water.
- Arm floaters for kids and floating pool toys aren't sufficient.

- And anyone who goes boating should wear a life vest.

- Swimming pool in your backyard? You should install a fence to separate it from the house or the rest of the yard so that children can't get to the pool when you're not watching. The gate should lock or latch automatically.
  If you're swimming at the beach and find yourself caught in a rip current, don't swim directly toward the shore, or you'll risk exhausting yourself. The National Ocean Service advises swimming parallel to the shore until you're out of the current, then swimming back to the shore at an angle.

Gaps

- Most of the children and youth going for swimming or bathing in the rivers or sea do not know swimming.

- Carelessness

- Old boat with unskilled boat drivers

- Too many people travelling in small boat

- Lack of life jacket

Snake bite

Odisha is one among the snakebite prevalent states with large number of fatalities. Here, not only the rural and agricultural predominance contribute to high mortality, but the lack of prompt ambulance service and loss of golden period of treatment is spoiled by resorting to traditional methods. Odisha witnessed 305 human death due to snake bite in the year 2015 and 2016 alone. There is hundreds of such death every year but due to lack of publication it get confined to the families and communities alone.

Technically, major burden of the problem can be solved by 108 ambulance services for transport and Anti Snake Venom used judiciously in time, but inherent delay in transporting the victim due to prevalent sociological milieu is a hurdle in this direction. There is necessity of motivation in snakebite prevalent areas through health education by regular health workers, PRI representatives and voluntary agencies. Time, transport and therapy will remarkably reduce the alarming incidence of snakebite in the tropical environment.

It is estimated that 2500 to 6000 cases of snakebite occurs in Odisha and out of them, 400 to 900 cases die (around 1000 snakebite deaths per annum in Odisha) According to Dr. Indramani Jena of India : total 600,000 to 1600, 000 cases of bite and 11,000 to 25, 000 deaths due to snakes. This is due to tropical climate, agricultural and forest based profession and many social factors.

But it is a fact that snakes and snakebites are reducing in number due to pesticide use, urbanization and deforestation. Evidences of snakebite attendance in medical centres at present and revealed figures given by newspapers now a day are definitely reduced to some extent compared to figures of a decade back. The faster urbanization and deforestation is a way definitely to reduce snakebite substantially, yet total reduction cannot be thought of in such a tropical climate.

Snake bite is a common and frequently devastating environmental and occupational disease, especially in rural areas of tropical developing countries. Its public health importance has been largely ignored by medical science. Snake venoms are rich in protein and peptide toxins that have specific city for a wide range of tissue receptors, making them clinically challenging and scientifically fascinating, especially for drug design.

Preventive efforts should be aimed towards education of affected communities to

- Use proper footwear and to reduce the risk of contact with snakes to a minimum through understanding of snakes' behaviour.
- To treat envenoming, the production and clinical use of anti venom must be improved.
- Increased collaboration between clinicians, epidemiologists, and laboratory toxicologists should enhance the understanding and treatment of envenoming.

Gaps

- Traditional practices of going to baba/priests for healing which leads to fatal death.
- Non availability of Anti Snake Venom in PHCs in large scale
- In accessibility of 108 ambulance at the right time.
- Illiteracy and ignorance of the people

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