

# Climate Change related vulnerabilities and measures to combat

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# Impact

- Climate change is a Global threat. Over the previous decades, it is predicted that billions of people, particularly those in developing countries, face shortages of water and food and greater risks to health and life as a result of climate change. United global action is needed to enable developing countries to adapt to the effects of climate change that are happening now and will worsen in the future. But it is very unfortunate that 90% of people are still ignorant about its effect.

**As we know that unusual changes in Temperature is a major contribution of Climate Change. Temperature has major impact on human and environment**

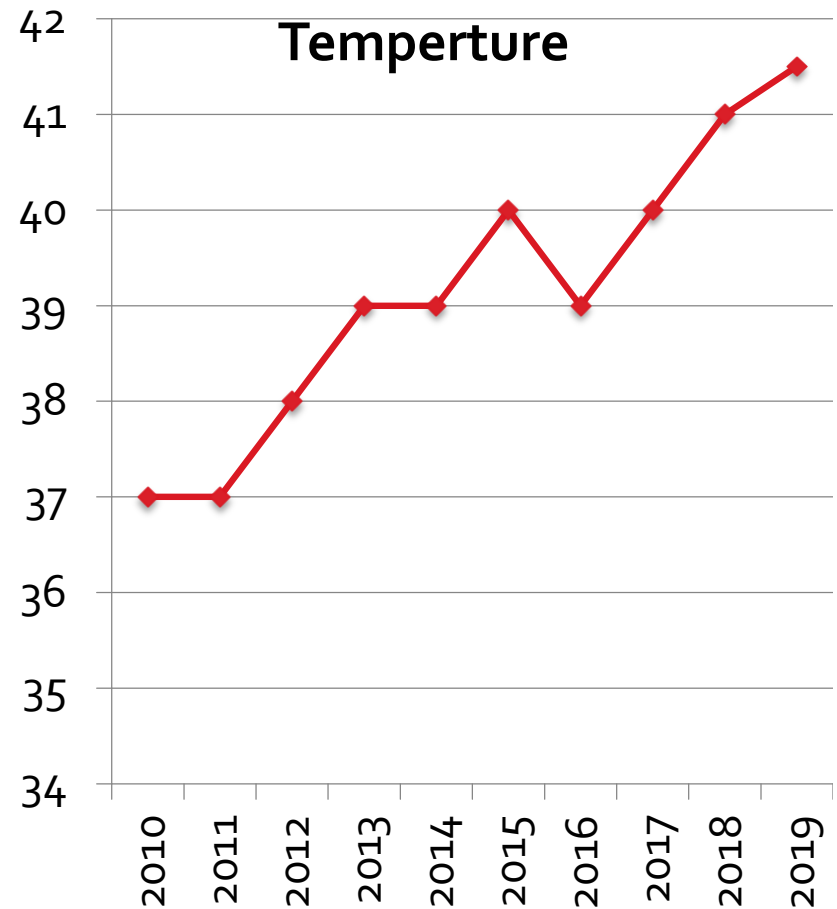
Climate change destabilises the Earth's temperature equilibrium and has far-reaching effects on human beings and the environment. During the course of global warming, the energy balance and thus the temperature of the earth change, due to the increased concentration of greenhouse gases, which has a significant impact on humans and the environment.

The direct outcome of man-made climate change include:

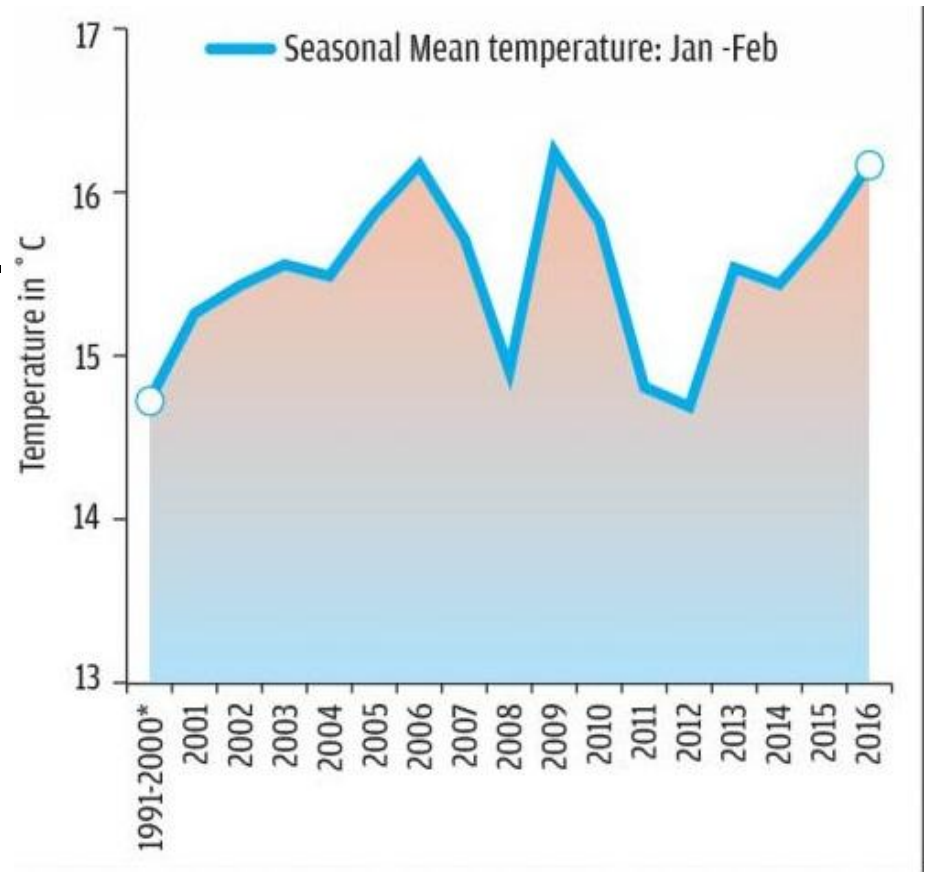
- rising maximum temperatures
- rising minimum temperatures
- rising sea levels
- higher ocean temperatures
- an increase in heavy intensity (heavy rain and hail)
- shrinking glaciers



Abnormality in temperature has Significant impact on odisha. if we view the 15 years of record the maximum temp has raised up to 2 to 4 DC. Also minimum temp has raised accordingly. Rising in temp has a great impact on our ecosystems. Means that ecosystems will change; some species are being forced out of their habitats (possibly to extinction) because of changing conditions, while others are flourishing. In Odisha some experts says around 15 sepsis of small plants are in threat due to high Temp and . Some insects and animals also are Not seen was earlier. Due to rise in temperature sever water crisis is faced in coastal state odisha.



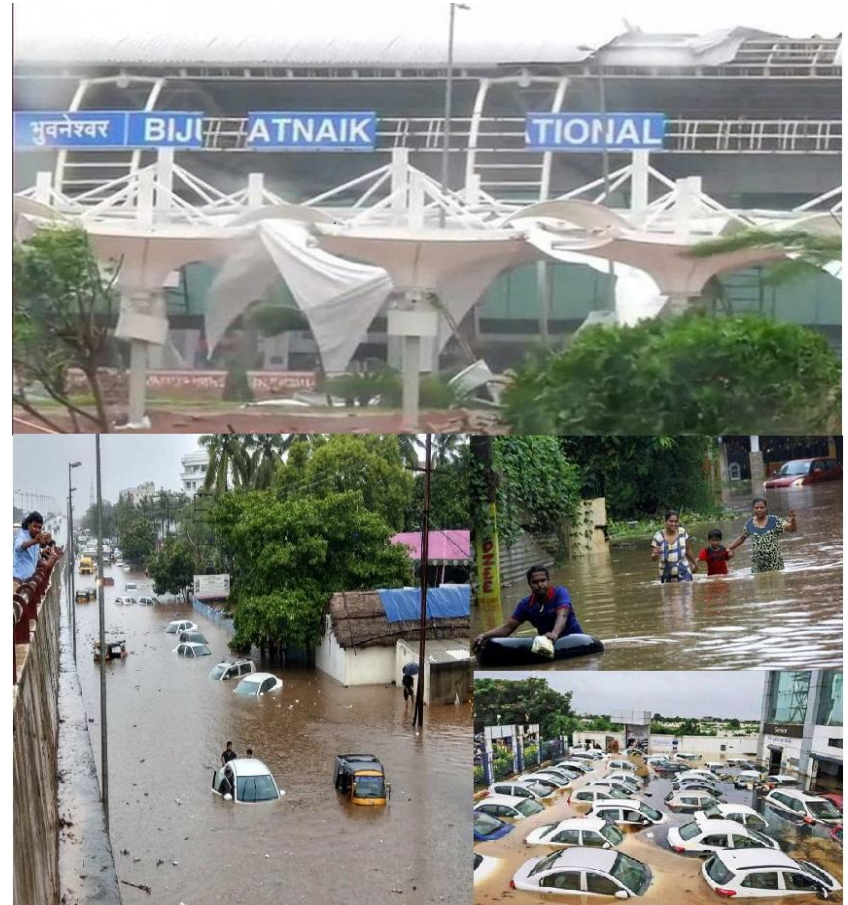
- Picture shows the rise of minimum temperature in odisha.



# Extreme Weather Events:

Generally, the climatic impacts such as sea rise, high tide enter into land, cyclone, famines, wildfires, severe storms, unusual rain, Heat wave, Thunderstorms with lightning and natural disasters is devastating our socio economy. Damages made by disasters require extensive reparation of essential infrastructure including houses, road and rail network, bridges, airport runways, power lines, dams and embankments.

Lost productivity: Day-to-day disturbances that can occur due to variations in the climatic conditions and may result in lost work and institutional days and damage trade, transportations, cultivation, energy manufacture, fisheries and leisure industry. Severe weather conditions such as rainfall and snowstorms lead to delay in cultivation, power outages, traffic and air travel delays and furthermore, making it difficult to go about daily businesses.





# Foni

- Odisha has witnessed very severe cyclone Foni in 3<sup>rd</sup> of May 2019. It hits the holy city Puri and capital of state. Foni has devastated the infrastructure and basic services of state. Approximately loss of Infrastructure has recorded around 5000 corers. It claims more then 74 lives. Basic service had been lost for near about one month. Eight months has been passed, Infrastructure is yet to repair in rural part. Apart from that unusual heavy rain and heat wave hit the state a number of times every year. Which cause loss of human life and infrastructure.



# DISASTER IN ODISHA

For over a decade, Orissa has been unstable from one extreme weather condition to another: from heat wave to cyclone, from drought to flood. The state has been declared disaster-affected since 1965, Odisha has experienced more and more flood, drought and cyclone for last 24 years. From the year 2012 the frequency and intensity of extreme events has raised. State has witnessed 16times drought and 27times flood and 7 very sever cyclone within last 24 years. Apart from that land sliding, lightning, thunderstorm like disaster has unbalanced the socio economic condition of people as well as State.



**1999- Super Cyclone**



**2019- Foni**



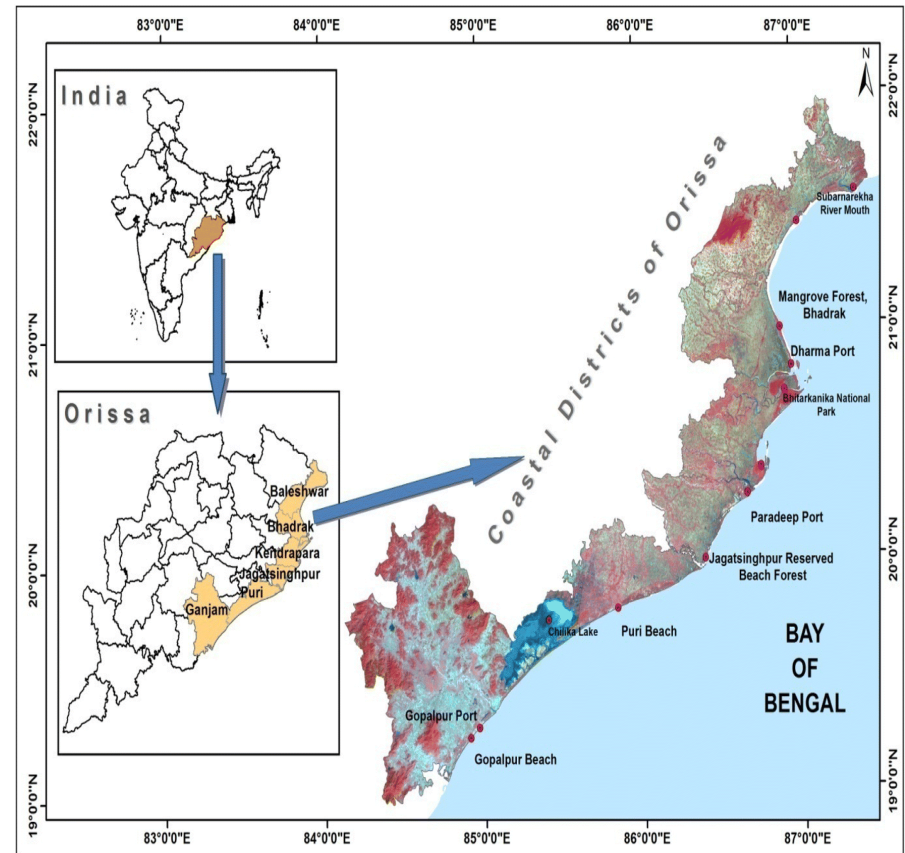
# Now thunderstorms and lightning has become a major disaster of state.

- Lightning has been the biggest killer in the State. During last 7 years lightning has taken 2840 lives more than any other natural disaster during the period. On an average it takes around 405 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. As per reports received from the Collectors, as many as 1261 lightning deaths have occurred in the State during the last 3 years, i.e., from 2015-16 to 2017-18.



# Coastal Vulnerability Index (CVI)

- The CVI assessment for the Odisha state indicates that a length of 37 km (7.51%) is under Very High Vulnerable Category. 86km(17.42%) of coast comes under high risk area. The major class is the Medium Vulnerable recording a length of 267 km (~53.78%); whereas Low Vulnerable classes recorded a length of 106 km (constituting 21.29 % ) respectively.
- The coastal stretches of Puri, Jagatsinghpur, Kendrapada, Bhadrak and Baleswar recorded High to Very High Vulnerable classes. In general, the CVI analysis shows the northern part of the coast as Medium to Very High Vulnerable expect for a few low category patches; whereas the southern parts of the state were categorized as Medium to Low Vulnerable classes.



# Coastal Erosion



- Coastal erosion is a common phenomenon all over world. In odisha its a continues process in coast. As per experts view more then 100 kms of beach is erosion pron. The Ramayapatnam of chikiti block under Ganjam District faced sever erosion in 2019 April. Life and livelihoods of that village people is under threat.



# Sea Erosion-Odisha



- This place is known as Satabhaya of Jagatsingpur district Odisha where 7 villages has been washed out

# Climate Change Impact on Water



- In fact, “most of the climate change impacts come down to water,” says [Upmanu Lall](#), director of the Columbia Water Centre. When people talk about climate change affecting agricultural output, sea level rise, wildfires and extreme weather — he was on water crisis issue.

## Evaporation

Warmer air can hold more moisture than cool air. As a result, in a warmer environment, the air will suck up more water from oceans, lakes, soil and plants. The drier conditions this air leaves behind could negatively affect drinking water supplies and agriculture. On the flip side, the warmer, wetter air could also endanger human lives. A study out of Columbia University’s Lamont-Doherty Earth Observatory found that higher humidity will make future higher temperatures [unbearable](#) in some places, by blocking the cooling effects of our sweat.



### Precipitation

When all that extra warm, extra wet air cools down, it drops extra rain or snow to the ground. Thus, a warmer world means we get hit with heavier rain and snowstorms. Odisha is so far seeing the largest increase in the intensity and frequency of heavy precipitation events. And in the South and western odisha clusters of thunderstorms have been becoming more frequent and dropping more precipitation since 2012



# River Bed are dried

Since Last few years water crisis in odisha is increasing. The Largest River of Odisha i.e. Mahanadi is getting dried just after monsoon. The 42% of the people of Odisha depends on Mahanadi for their daily water requirements. 50% of the agriculture and 65% of the total industries of the state depends on this river.

As per PH Dept Report Mahanadi and its branch rivers are going dried by march of every year since last 5 years. To meant the water demand they are obstructing waters through temporary sand dams. It is the condition of all rivers of the state.



## Evaporation of Surface Water

State is going in severe water scarcity. Govt data shows water available for 93% of the people. But it is only pen and paper. The actual condition is unbearable. The real picture of water crisis is very much pathetic. Women are standing hours in line to get 8lt of water in a day, walking up to 5 kms to get water of their kitchen.



# Threat to Mangroves and sand dunes and pits

- Mangroves and Sand dunes, Sand pits are the natural barrier between sea and human habitat. Due to Coastal degradation these barriers are vanishing from globe. It is a major concern now a days. But it is very unfortunate that neither coastal community nor govt has any seriousness to protect the natural boundary.
- For this, satellite data of different time periods (Landsat MSS of 1973, [Landsat TM](#) of 1990 and [IRS P6 LISS](#) III of 2006) were used. It was found that the delta was occupied by dense mangrove (12.6%), open mangrove (3.3%), aquaculture (12.9%) and agriculture (30.9%) in 2006. A loss of 2606 ha mangrove area and an increase of 3657 ha aquaculture area was observed from 1973 to 2006 clearly depicts the augment of [aquaculture industry](#).
- The situation in 2020 is not good, still the mangroves field is being destroyed for aquaculture.
- According to the information received on January 30, the mangroves are being cut from Kanapalli between Karanjmal coastal area near Dhamara of Bhadrak District, Odisha. Some other mangroves field has affected by dredging of the port. At least 200 acres have been lost in between 2018-19.
- It is a matter of concern that 2nd largest mangrove diversity jungle of world that is Kalibhanja diha is being destroyed by the effect of dhamra port activities.
- On the other hand our state govt demanding that mangroves forest is rising every year. As per the 2019 FSI report Odisha have total 251 sqkm of mangroves in coastal district. Which is 8sqkm more then 2017 report.
- Odisha Coast was safe since back. Thousands of Sand dunes and pits are standing from Puri to Chilika which was the natural barrier. Existence of these Sand dunes and pits was up to 1995 some extent upto 2002. Due to more human interference these duns and pits vanished. Sand mafias looted the sands one RK Ratha aged about 73 of Puri town told. Due to decrease in natural boundary the coastal community is facing the sea directly.



# Men made impact on natural barrier





# Chilika is Shrinking

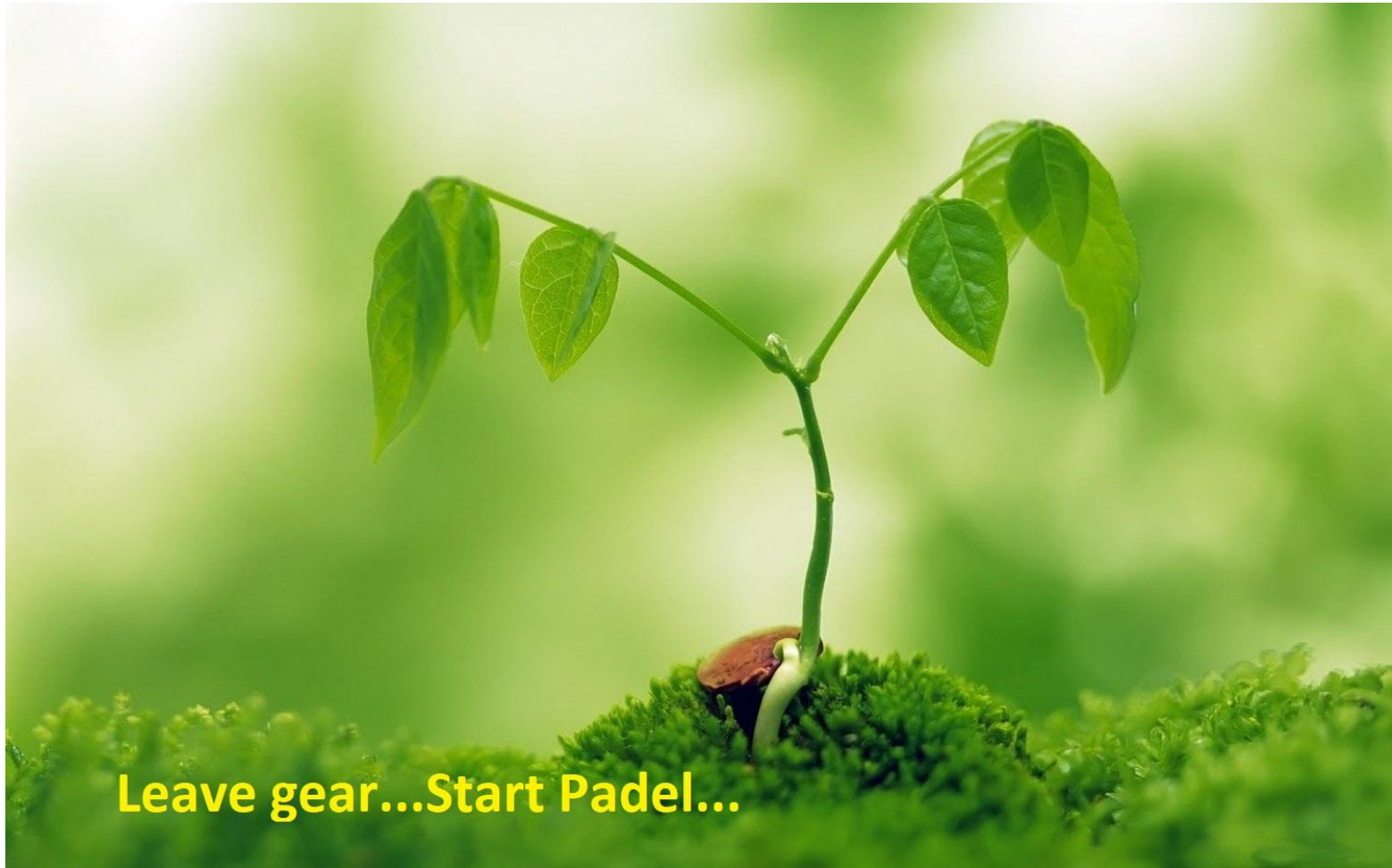
- **Chilika Lake** is a brackish water lagoon, spread over the Puri, Khurda and Ganjam districts of Odisha state on the east coast of India, at the mouth of the Daya River (Branch of Mahanadi), flowing into the Bay of Bengal, covering an area of over 1,165 to 906 sq km. It is the largest coastal lagoon in India and the second largest brackish water lagoon in the world

## Threats

- Over the years, the ecosystem of the lake encountered several problems and threats such as:
- Siltation due to littoral drift and sediments from the inland river systems
- Shrinkage of water surface area due to Gheries
- Choking of the inlet channel as well as shifting of the mouth connecting to the sea
- Decrease in salinity and fishery resources
- Proliferation of freshwater invasive species and
- An overall loss of biodiversity with decline in productivity adversely affecting the livelihood of the community that depended on it
- Fights between fishermen and non-fishermen communities about fishing rights in the lake and consequent court cases
- The rapid expansion of commercial aquaculture of prawn has contributed significantly to the decline of the lakes fisheries and bird population
- Due to men made activities Chilika is shrinking rapidly. Govt Statics shows different figure but reality is very crucial. Chilika has reduced around 200 sq km and it has now confined within 900 to 850sqkm as fishermen says.



# *Thank You*



**Leave gear...Start Padel...**