



CLIMATE CHANGE AND ORISSA

What is the problem?

Life, as we know today, exists because certain gases like carbon dioxide, methane and nitrous oxide help in maintaining the Earth's temperature at a desired level. These 'greenhouse gases' (GHGs) act like a blanket. They prevent much of the absorbed solar heat from escaping into the atmosphere. This natural phenomenon keeps the Earth warm enough to sustain life.

Problems arise when the concentration of GHGs in the atmosphere starts increasing due to human activities. Burning fossil fuels like coal and oil to derive energy, deforestation and biomass burning are some such activities. As the world became heavily dependent on carbon-based fossil fuels, the Earth's temperature has increased consistently leading to global warming and climate change.

Who is responsible?

Industrialised countries with their energy-intensive lifestyle are historically responsible for the problem of global warming. Each person in such countries emits much more than a person in developing countries. For instance, in 1996, one US citizen's emissions were equal to those of 19 Indians. International negotiations aimed at arresting global warming have failed to address the issue of inequality in per capita emissions. The atmosphere is a common property resource to which every human being has an equal right and it is now the turn of developing countries to demand appropriate 'environmental space' for their future economic growth. Moreover, the maximum impact of global warming will be borne by developing countries like India, which have hardly contributed to the problem.

Is Orissa being affected by climate change?

The state's fluctuating weather conditions suggest that it is reeling under climatic chaos. For more than a decade now, it has experienced contrasting extreme weather conditions: from heat waves to cyclones, from droughts to floods. In the last four years, calamities have claimed more than 30,000 lives. They have not only become more frequent, but have hit areas that were never considered vulnerable. As a result, Orissa's economy has been ripped apart.

Floods have become an annual affair with the monsoon of 2001 leading to the worst ever flood recorded in Orissa in the past century, as 25 of the 30 districts were inundated affecting one-third of the state's 30 million residents. Areas with no history of floods such as districts in western Orissa were submerged.

Ironically, Orissa suffered one of its worst droughts in the same year. It affected the lives of 11 million people in more than two-thirds of the state's districts, engulfing earlier drought free districts like Sundergarh and Kendrapada. The state government put the economic loss due to crop damage at Rs 642.89 crore.

A heat wave in 1998 killed around 1500 people, mostly in coastal Orissa, a region otherwise known for its moderate temperature. The mean daily maximum temperature of the state is gradually increasing as also the mean daily minimum temperature. The Titilagarh and Koraput belt comprising entire south and western Orissa has witnessed an exceptional rise in daily maximum



ozone depletion
hazardous waste
prior informed consent
right to information
commission on sustainable development
climate
biodiversity
desertification
persistent organic pollutants
forests
trade and environment
multilateral agreement on investment
global environment facility
institutions for environment



Drought in 2001 caused an economic loss of about Rs 643 crore due to crop damage and affected 11 million people. Floods in 2001 inundated 25 of the 30 districts. Due to such calamities, an average 900,000 hectare of agricultural land lose crop every year in the state

and minimum temperature. Earlier western Orissa was a known calamity hotspot, but now the coastal areas are also experiencing heat waves. Bhubaneswar now has a mean maximum temperature above 40°C — which is comparable to Sambalpur located in the interior.

The frequency of cyclones has increased on the Orissa coast. In 1999, two cyclones hit the state in quick succession. The second one lasted three days and ravaged 14 coastal districts. Around 15 million people were affected. Two million tonnes of rice crop was lost and 17,000 square kilometre of agricultural land was devastated. Official estimates put the loss at Rs.10,000 crore.

Around 200,000 trees were uprooted in about 25,000 hectare (ha) of reserved forest. In the districts of Jagatsinghpur and Kendrapada, the forest cover has now been reduced by 50 per cent. The microclimate of the region has changed after this loss in vegetation. Temperature data of the coastal region in the last three years shows wide fluctuations and average temperatures have risen. Change in climate following the super cyclone possibly caused the state's mango and mahua trees to flower unusually early. Mango trees in Orissa generally begin to flower in November while mahua trees flower from February. But in 2000, mango trees began bearing flowers in September and the mahua trees started flowering in December. Mangoes are a staple diet for Oriyas in summer. Flowers of the mahua tree are collected and sold, providing a livelihood to thousands. Sale of a local brew made from these flowers fetches the state about Rs.50 crore every year.

Such events have hit agriculture — the state's backbone, the most. Due to calamities, an average 900,000 ha of agricultural lands lose crop every year in the state. Agriculture's share in the net state domestic product has decreased from 33 per cent in 1998-99 to 30 per cent in 2000-01. In the last 50 years, the food production has decreased by 40 per cent.

Why has Orissa been affected the most?

It is placed at the head of the Bay of Bengal where weather is formed. So even a slight change in the sea's behaviour can have an immediate impact on the coast. The Bay becomes the centre of low pressures causing heavy rains and cyclones in the sub-continent and especially in Orissa. These cyclones and depression involve circulation over thousands of kilometres and form links between Orissa's atmosphere and the entire planetary circulation system. Going by the key parameters of climate like temperature and rainfall, the climate may worsen in Orissa. The full impact of climate change does not show up immediately. It triggers changes slowly but certainly.

What could be the other impacts of climate change on a coastal state like Orissa?

Apart from more frequent extreme weather events like floods and droughts, large-scale impact of climate change will include an increase in sea level causing economic loss and disruption of life.

The economic impact of a one metre sea-level rise on coastal district like Balesore could be Rs 360 crore. In a case study of the Orissa and West Bengal region, an international body of scientists estimated that in the absence of protection, a one metre sea level rise will inundate an area of 170,000 ha —

**The economic impact
of a one metre sea-level
rise on a coastal district
like Balesore could be
Rs 360 crore**

predominantly prime agricultural land — and displace 0.7 million people. An additional 4000 kilometres of dykes and sea walls will be required to protect the area.

With sea level rise, many coastal systems will experience increased levels of inundation and storm flooding, accelerated coastal erosion, seawater intrusion into fresh groundwater and encroachment of tidal waters into river systems. Big cities situated on coasts, flood plains and river deltas, supporting a large number of people and industries can expect increased flood damage causing loss of structures and property. Disappearing shorelines also mean some loss of social amenities.



Coastal erosion will increase substantially, endangering natural protective features such as mangroves and barrier islands, and exacerbating flood risk. Consequently, many coastal communities dependent on these and fisheries will suffer. Deltas and low lying coastal areas will be inundated by sea level rise. Increased rainfall during the monsoons will increase the frequency of floods. Areas already prone to floods will suffer more. Both religious and resort-based coastal tourism will suffer.

It is important to note that all this implies displacement of large numbers of people

leading to rapid urbanisation, straining resources and putting more pressure on civic amenities.

Agriculturally fertile coastal regions with paddy fields are vulnerable to inundation and salinisation. Orissa normally produces around five million tonnes of rice each year. The rice crop on the coast contributes about 40 per cent to the total rice grown in the state.

With rising temperatures, pest population will significantly increase because generally warmer and moist conditions are highly conducive to them. Higher temperatures also speed up the life cycle of both the mosquito and the disease organisms they harbour and make adult mosquitoes bite more often. The state accounts for 15-22 per cent of malaria cases in the country and 40-50 per cent malaria related deaths. At 20°C, mosquitoes take 26 days to breed. This period reduces to 13 days when the temperature rises to 25°C, which is also the average temperature of Orissa now.

A possible increase in cyclone intensity of 10-20 per cent against a rise in sea surface temperature of 2 to 4°C is very likely to happen. Climate change has already intensified the Asian monsoon and increased river flows. Experts say Orissa should brace itself for more severe flooding in years to come because of deforestation, faulty flood control planning and global climate changes.

Disasters have a long-term impact, as people are forced to spend more of their earnings on basics like home and agriculture. The already stressed ecosystem

**Build and sustain
pressure on the state
government to take up
the issue of impacts of
climate change with the
central government**

is made even more fragile with each disaster. And the poor living on the margins of subsistence are forced into greater penury. With each disaster their capacity to rebuild is reduced.

What can you do?

- Recognise that global warming will have economic as well as health and environmental impacts on people in your region. It is even more important to communicate this information to the common person in order to build and sustain pressure on the state government to take up the issue with the central government.
- Initiate debate on the impacts of global warming in the region with other NGOs, media and political groups will go a long way in making sure that your local MLA takes the issue seriously and thinks of it as a problem that concerns people in his/her constituency.
- Push the national government for a Delhi Mandate on impacts of climate change on developing countries. The next round of international negotiations, scheduled in Delhi for October 2002 provides a good opportunity for India to take the lead and focus on the cost of adaptation efforts in developing countries. So far, transferring a share of proceeds from mitigation projects in developing countries is the only way to fund adaptation activities. This amounts to taxing the South to help it adapt to the impacts of a problem that is largely a creation of the North. In the run up to the negotiations, local NGOs have a responsibility to ensure that the government pushes for an effective adaptation mechanism where industrialised countries bear this cost.
- Given the paucity of information that exists on the impacts of climate change on Indian states, it is necessary to insist that Indian scientific institutions generate detailed studies listing these impacts and make these available to the people.



GLOBAL ENVIRONMENTAL NEGOTIATIONS

This series provides a close analysis of important environment-related conventions and institutions from their origins, and demystifies the politics of 'saving the environment'.

A first-ever comprehensive Southern perspective of the impact of global environmental governance on the real lives of real people.

In addition to dealing with five new issues, the second volume, *Poles Apart* contains updates on the issues dealt with in the first report, *Green Politics*. The updates cover only recent developments — a complete historical background can be found in the first report.

