



Climate Change – Impact of Different Cyclones

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ABSTRACT

Climate is a complex and interactive system. Climate is the long-term average of a region's weather events, thus the phrase 'climate change' represents a change in these long-term weather patterns. With the advent of the stability and statistics era, Climate data series started working as powerful basis for risk management. The system post-1970s was revolutionized with the arrival of Satellites which boosted the science of "climate system" and global monitoring. Another important issue Global Warming refers to an average increase in the Earth's temperature, which in turn causes changes in climate patterns. By continuing research and development the climate change has to be estimated and also measures to be taken for reducing damage of assets and human lives and protection of environment.

Keywords: Climate Change, Global Warming, Sustainable Development

INTRODUCTION:

Climate is a complex and interactive system. It consists of the atmosphere, land surface, snow and ice, oceans and other water bodies, and living beings. Among these, the first component, atmosphere characterizes climate. Climate is the long-term average of a region's weather events, thus the phrase 'climate change' represents a change in these long-term weather patterns. For example, it's possible that a winter day in Jammu, could be sunny and mild, but the average weather – the climate – tells us that Jammu's winters will mainly be cold and include snow and rain. In the pre-industrial era any kind of natural calamities or disasters and significant change in the environment used to be considered as "acts of the divine". With the advent of the stability and statistics era, Climate data series started working as powerful basis for risk management. The system post-1970s was revolutionized with the arrival of Satellites which boosted the science of "climate system" and global monitoring. Another important issue Global Warming refers to an average increase in the Earth's temperature, which in turn causes changes in climate patterns. A change in the net energy available to the global atmosphere system is called 'radioactive forcing'; it can be natural or anthropogenic. The radioactive forcing can be positive means it will warm and negative means it will cool the climate system. A warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on flora and fauna and humans.

CAUSES FOR CLIMATE CHANGE:

Over the last decade the consensus on the science of climate change has firmed up quite considerably. As per the Intergovernmental Panel on Climate Change (IPCC): "Warming of the climate system is unequivocal... There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities. Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations"

The important causes are as follows:

1. Continental Drift
2. Eruption of Volcanoes
3. The Earth's tilts
4. Ocean currents

5. Industrial revolution
6. Green House gases
7. Vehicles
8. Large scale of wastages
9. Deforestation
10. Exploitation of Natural resources

CLIMATE CHANGE- CYCLONES AFFECTED INDIA:

In the last 100 years the mean annual surface air temperature has increased by 0.4-0.6 O C. There are indications that the annual mean surface temperature rise may range between 3 to 5 C under A2 scenario and 2 to 4C under B2 scenario, by the end of century. The North India may become the warmest part in India. The warming may be more pronounced in the northern parts of India. Many research works show that extremes in maximum and minimum temperatures are also expected to increase under changing climate few places are expected to get more rain while some may remain dry leaving Punjab and Rajasthan in the North West and Tamil Nadu in the South. Climate change will impact across the sectors. The outcome of climate change on the developing and the least developed countries are excessively high, due to three main reasons: first geographical location, second high dependence of people on natural resources that are highly sensitivity to climate change, third low adaptive capacity due to fewer amounts of resources available to them. A National Committee has been constituted to assess the Impacts of Climate Change under the chairmanship of the Principal Scientific Advisor to the Prime Minister, and includes meteorologists, climate modelers, hydrologists, energy economists, as well as representatives of key Ministries. The Committee is evaluating the impact of climate change on key development activities, and assessing options to mitigate climate risks. At the national level, the integration of climate change in national development is guided by the Prime Minister's Council on Climate Change, which includes representations of key Ministries, as well as experts, and representatives of industry and of media etc. The Council provides overall strategic guidance on mainstreaming climate change in development, identifies key intervention priorities, and monitors the implementation of these interventions. Let us hope that Council of Climate Change and National Committee on Climate Change will come up with some tangible solutions and definite guidelines which can be implemented at the local level while acceptable at the global level.

The list below shows the Tropical cyclones that affected India since 1990. Depressions and Deep Depressions are not listed in this list. The 1999 Orissa cyclone is the strongest storm to hit the Indian coast, as well as the strongest in the basin till date.

1. The 1990 Andhra Pradesh cyclone (IMD Designation: BOB01, JTWC Designation: 02B) was the worst disaster to affect Southern India since the 1977 Andhra Pradesh cyclone. The cyclone formed as a tropical disturbance early on May 4, 1990 while moving towards the northwest. The cyclone had a severe impact on India, with over 967 people reported to have been killed. Over 100,000 animals also died in the cyclone with the total cost of damages to crops estimated at over \$600 million (1990 USD).
2. The 1998 North Indian Ocean cyclone season was an active season in annual cycle of tropical cyclone formation. The season has no official bounds but cyclones tend to form between April and December. Over 10,000 people were killed in India when Tropical Cyclone 03A brought a 4.9-metre (16 ft) storm surge to the Kathiawar Peninsula, inundating numerous salt mines. Total damages from the storm amounted to Rs. 120 billion (US\$3 billion). Tropical Cyclone 01B killed at least 26 people and left at least 4,000 fishermen missing in eastern Bangladesh on May 20. A short lived depression in mid-October killed 122 people after triggering severe flooding in Andhra Pradesh. In November, Tropical Cyclone 06B killed six people and caused property damage worth BTN 880 million (US\$20.7 million) in eastern India. An additional 40 people were killed and 100 fishermen were listed as missing after Tropical Cyclone 07B affected Bangladesh.
3. The 2003 North Indian Ocean cyclone season had no bounds, but cyclones tend to form between April and December, with peaks in May and November. These dates conventionally delimit the period of each year when most tropical cyclones form in the northern Indian Ocean. The third and final tropical depression of the season developed on December 11 in the Bay of Bengal, a short distance northwest of Sumatra. It tracked northwestward, slowly intensifying to a peak of 65 mph winds. It struck False Divi Point, India on the 15th at that intensity, and dissipated the next day. Rainfall from the storm caused the deaths of 27 people and damage of 5100 homes in India.
4. Cyclone Yemyin (JTWC designation: 03B, also known as Cyclonic Storm Yemyin and Deep Depression BOB 03/2007) was a deadly tropical cyclone that made landfalls on India and Pakistan. The Pakistan Meteorological Department referred to Tropical Cyclone 03B as "Tropical Cyclone Yemyin". At the time, the official WMO body responsible for tropical cyclones in the Arabian Sea, the India Meteorological Department (IMD), did not name the storm. Throughout three countries, 983 people were killed: 730 in Pakistan, 140 in India and 113 in Afghanistan. In all, the storm wrought roughly \$2.1 billion in damage in India and Pakistan.
5. The 2008 North Indian cyclone season was an ongoing event in the annual cycle of tropical cyclone formation. The North Indian cyclone season has no official bounds, but cyclones tend to form between April and December, with peaks in May and November. The 2008 North Indian Ocean season was average in activity, but was very eventful. This season ranks as the costliest and one of the deadliest seasons on record, with about 12 billion dollars in damage and over 138,000 deaths.
6. Cyclonic Storm Laila named by Pakistan (IMD designation: BOB 01, JTWC designation:01B) is the first cyclonic storm to affect southeastern India in May since the 1990 Andhra Pradesh cyclone. The first tropical cyclone of the 2010 North Indian Ocean cyclone season, Laila developed on May 17 in the Bay of Bengal from a persistent area of convection. Strengthening as it tracked northwestward, it became a severe cyclonic storm on May 19. In Tamil Nadu Nine people were killed as the cyclonic storm "Laila" battered the Coastal areas in Northern parts of Tamil Nadu, Chennai city and its suburbs. Several fishermen, who put out to sea in 100 boats were reported missing since May 17, according to fisheries department sources. In Andhra Pradesh the toll in the cyclone-related incidents rose to 36 on Friday with 12 more deaths reported from Krishna (4), Guntur (3), Vizag (3) and Prakasam (2) districts. "Several persons are reported missing from the worst-hit coastal districts. More than 170 houses were completely destroyed and 265 suffered partial damage while 367 livestock perished in the cyclone.
7. Cyclonic Storm Nilam (IMD designation: BOB 02, JTWC designation: 02B, also known as Cyclone Nilam) was worst tropical cyclone to directly affect south India since Cyclone Jal in 2010. Originating from an area of low pressure over the Bay of Bengal on October 28, the system began as a weak depression 550 km (340 mi) east-northeast of Trincomalee, Sri Lanka. More than 3000 people were evacuated around Mahabalipuram in the wake of the storm. Nilam was initially estimated to have caused economic losses of around ₹700 million (US\$13.23 million) to ₹800 million (US\$15.12 million). The figures soon went up to ₹100 crore (US\$18.9 million). Later, as the Andhra Pradesh government conducted their review on the storm, it was revealed that the state suffered huge economic losses of ₹200 crore (US\$37.8 million). In Ahmedabad, the skies turned cloudy and humid. The sudden change in weather conditions followed a slight drop in temperature.
8. Severe Cyclonic Storm Onil (India Meteorological Department designation: ARB 03; Joint Typhoon Warning Center designation: 03A) was the first tropical cyclone to be named in the northern Indian Ocean. Forming out of an area of convection several hundred kilometres southwest of India on October 1, Cyclone Onil quickly attained its peak intensity on October 2 with winds of 100 km/h (65 mph) and a barometric pressure of 990 mbar (hPa; 29.23 inHg). Throughout southeastern northwestern India, thousands of residents were evacuated prior to the cyclone's arrival. In these areas, the storm produced moderate to heavy rainfall, peaking at 145 mm (5.7 in) in Thatta, Sindh, Pakistan. These rains led to flash flooding in several areas. Nine people died in several incidents related to the storm in Karachi.
9. Cyclonic Storm Phyan (IMD Designation:ARB 03 JTWC Designation:04A) developed as a tropical disturbance to the southwest of Colombo in Sri Lanka on November 4, 2009. During the next day, the Depression turned towards the northeast the IMD reported that it had intensified into a Cyclonic Storm and named it as Phyan. A massive damage to property was reported in the districts of Ratnagiri, Raigad, Sindhudurg, Thane and Palghar districts.
10. Severe Cyclonic Storm Jal (IMD designation: BOB 05, JTWC designation: 05B), also known as Cyclone Jal, is the fifth named cyclonic storm and the fourth Severe Cyclonic Storm of the 2010 North Indian Ocean cyclone season. Jal is a Sanskrit word, meaning water. At least 54 people are known to have been killed in India. As a tropical depression, Jal produced torrential rains over parts of Thailand and Malaysia, triggering severe flooding which killed 59 and four people in the two countries respectively. In Sri Lanka, heavy rainfall with strong winds has caused flooding affecting around 80,000 people.
11. Tropical Storm 06B formed 550 nautical miles (1,020 km) east of Chennai on December 6, west of the Andaman Islands. It became Cyclonic Storm Fanoos on December 7. Fanoos means chandelier in Urdu. Severe damage was reported in Sri Lanka where thousands of homes were either damaged or destroyed. Due to the quick weakening prior to landfall, only minor damage occurred in Tamil Nadu. However, heavy rains forced the evacuation of 30,000 residents in the area. No fatalities were reported from Fanoos.
12. Cyclone Nisha (IMD designation: BOB 07, JTWC designation: 06B, also known as Cyclonic Storm Nisha) was the ninth tropical cyclone of the 2008 North Indian Ocean cyclone season, and the seventh tropical cyclone in the Bay of Bengal that year. 189 people have been killed by

the heavy rains and floods caused by the Nisha in Tamil Nadu. Some places have recorded extreme rainfall, notably Orathanadu, Thanjavur District where over 660 mm of rain fell within a period of 24 hours and broke the 65-year old record of highest rainfall registered in 24 hours in Tamil Nadu. The most affected areas map released by Relief Web. Damage in India totaled to 3789 crores, or 800 million in 2008 USD.

Measures to meet climate change for sustainable development: The following measures are important for sustainable development by facing climate change.

- (1) Preparation of a model of sustainable global development to seek the realization of green jobs and just transition, and raise awareness of the linkages between sustainable development, natural resources, climate change.
- (2) To continue the work for the adoption of a fair, ambitious, and binding international climate change agreement and just transition policy framework at the earliest opportunity, and to promote the need for climate justice and a human rights-based approach when dealing with climate change

- (3) Participate in national political and social dialogue and contribute to providing solutions for the transition to a low carbon green and decent working life
- (4) Develop awareness-raising, research, training and policy guidance to increase trade union action on environmental issues.
- (5) To continue the involvement with UNEP and the ILO under the Green Economy Initiatives.
- (6) Maintain trade union work in other crucial multilateral processes linked to sustainable development, and ensuring that union views and proposals are reflected in the outcomes of the Rio+20 Summit in 2012;
- (7) To do strengthening trade union influence and capacity at the national and local level when climate policies will be decided and implemented.
- (8) Strengthen outreach work with governments, UN agencies, civil society organisations and enterprises on promoting the green and decent jobs agenda.

CONCLUSION:

By continuing research and development the climate change has to be estimated and also measures to be taken for reducing damage of assets and human lives.

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