



The Big Picture- Rising Oceans, Sinking Cities

Oceans act as a sponge for the ill effects of climate change. They absorb the heat and CO₂ generated by greenhouse gas emissions. However, the same oceans are today likely to unleash their wrath on a global scale.

According to a draft report of the United Nations [Intergovernmental Panel on Climate Change](#) (IPCC), destructive changes have already been set into motion. By the year 2050, many low-lying megacities and small island nations will experience extreme sea-level events every year. The final report is yet to be released in September after a thorough discussion with all the stakeholders.

Climate Change

- The Earth's climate has changed throughout history. In the last 650,000 years, there have been seven cycles of glacial advance and retreat, with the **abrupt end of the last ice age about 7,000 years ago** marking the beginning of the modern climate era, and of human civilization.
- The current warming trend is of particular significance because most of it is extremely likely (almost greater than 95%) to be the result of human activity since the mid-20th century and is proceeding at a rate that is unprecedented over decades to millennia.
- The **oceans** have **absorbed** much of this increased heat, with the top 700 meters (about 2,300 feet) of ocean showing warming of more than 0.4 degrees Fahrenheit since 1969.
- Global **sea level rose** about 8 inches in the last century. The rate in the last two decades, however, is nearly double that of the last century and is accelerating slightly every year.

Current Scenario

- According to the draft report of the IPCC, the events that were expected to happen in the future such as increased number of **cyclones**, enhanced [melting of glaciers](#), changed **rainfall & wind flow** pattern, changed chemistry of oceans, inter alia, are faced today itself by mankind.
- The volume of water has also increased significantly in recent years due to
 - **Melting of ice-** presently almost 400 million tonnes of ice is melting every year, and
 - **Thermal expansion** of water (expansion due to the heating of water caused by global warming).
 - This poses a grave danger to the low-lying areas located throughout the world.
- The number of **Heatwaves** (whereby the surface temperature of the oceans remains above normal for 2-5 consecutive days) & their intensity has increased significantly in the recent past. Their number is going to increase enormously in the times to come.

Findings From the Report

- The report states that the **big four** namely, the United States of America, China, India, and the [European Union](#) will face the most devastating fall out of the ocean and ice-related impacts of climate change.

- Although three of them (**except India**) have been the major contributors to this man-made problem, yet the biggest sufferers from climate change would be the smaller island nations & countries.
 - For e.g., **Kiribati** is expected to wipe out & Kiribas are looking for land in other places.
 - **Indonesia recently changed its capital** from **Jakarta to Borneo** due to the fear of submergence of the world's fastest sinking city, i.e, Jakarta.
- China's emissions are peaking at an extremely high rate.
 - Its gross emissions are **twice** as that of the US (the second-largest emitter) & per-capita emissions of China are touching the average per-capita emissions of OECD countries.
- According to the draft report, even if **Paris agreement targets** are met on time, global emissions will reach up to 3°C.
 - Paris agreement just ended the **capping & fixed target system** that was adopted during the Kyoto protocol, & introduced a new system known as the '**Pledge & Review system.**'

Kyoto Protocol

- The Kyoto Protocol was adopted in Kyoto, Japan, in 1997 and entered into force in 2005.
- The detailed rules for the implementation of the Protocol were adopted at **COP-7** in Marrakesh, in 2001, and are referred to as the **Marrakesh Accords**.
- Its first commitment period started in the year 2008 and ended in 2012.
- Kyoto Protocol Phase-1 (**2005-12**) gave the target of cutting down emissions by 5%.
- Kyoto Round- 2 gave the target of reducing emissions by at least 18% by the industrialized countries.
- The situation is extremely serious today, & the currently adopted **Intended Nationally Determined Contribution (INDC)** pledges are leading the world towards a higher rise in temperature than expected.

Global Actions Aggravating Climate Change

- Paris agreement is losing its force today.
 - The US has withdrawn from the Paris agreements, and the US President was absent at the recently held **G7** summit.
 - Even China is opening new coal mines because of its **trade war** with the US, thereby reducing its pollution control measures.
- Brazil is ignoring the repercussions of 'development' on the environment. The recent example of which is the deadly **amazon forest fires**. The same is the case with **Canada, Bolivia, & Australia**.
- Sustainable Development Goals are difficult to achieve if similar situations prevail.

Actions Required

- **Globally:**
 - **There is a closed relationship between water, land & cryosphere.** There is a need to adequately address and appreciate that relationship globally.
 - Oceans cover **three-fourths** of the globe. A large number of fishermen & the economy of various countries are dependent upon the oceans.
 - Because of global warming, pollution, oil spills, etc. oceans are badly abused. Hence, there is a need for aggressive cuts & a reduction in the abuse of oceans.
 - **Costs of adaptation of mitigation measures are highly uncertain** & no country in the world is prepared today to face climate change. Hence, both developed & developing economies need to take a dramatic shift & percolate down the efforts through societies on

- a war-footing level.
 - If serious actions are taken immediately, it is possible to restrict the temperature rise to 1.5° C.
- **At India's level:**
- Apart from adaptation, the need of the hour is to avert & delay the calamity by **promoting the non-fossil fuels**. India has already achieved its reduction targets, & is now raising the targets, focussing on **renewable energies**.
 - For e.g, India has met its Solar capacity installation targets.
 - India needs to calibrate its developmental programs to ensure that it performs better than industrialized nations. Such areas include
 - **Road transport**- that is given considerable importance today. But we need to look at the environmental costs it raises for the nation.
 - **Railways** network can be upgraded much more cheaply in a more eco-friendly manner to complement the road network.
 - India is doing well as compared to other countries on the basis of its Paris targets. Diplomatically, India needs to look at its actions that can be matched abroad like
 - India in collaboration with France launched the **International Solar Alliance**. The need is to take the leadership & pressurize other countries in terms of diplomacy on the issue of reducing their emission targets.

Way Forward

- The challenges of droughts, shrinking & sinking cities, high temperatures that we face today demand much more aggressive efforts. The time for action has come.
- China's resolve to postpone & fulfill its NDC targets from 2030 to 2025 is a welcome step in mitigating climate change.
- There are certain sectors & industries which are harmful to the environment. Because of the fear of loss of jobs in such industries (e.g automobile sector), nations have to keep them alive & sustaining. There is a need to identify viable alternatives for such industries.
- Oceans are going to increase further. There is a need to plan and prepare for the suitable **rehabilitation program** for the affected people (also known as **Ecological Refugees**). Nations need to appropriately identify the required efforts to relocate them properly, & the associated costs with their rehabilitation.
 - This issue gains much significance in the Indian context which has 7500 km long coastline, on which many megacities are situated.
 - The need is to avoid any forced eviction of people, and **empower & invest** in local coastal communities, so as to avert similar situations in the future.