Impact of Climatic Change in India: A Study on Fire and Flood Induced Disaster

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Abstract
Climate is changing very rapidly and creating a global threat to the world. There are so many reasons behind this problem. One of the major reasons is carbon emissions in atmosphere. The causes for this global threat are many, among them GHG (green house gas emission) is one of them. Also deforestation, land use change, sulfate aerosol and black carbon are the other major reason leading to the ozone layer depletion and changing climate. Due to the carbon emission atmosphere is being polluted and also so many disasters happen routinely. Atmosphere is getting hot day by day. Due to this unnatural and sudden temperature rise, glaciers are melting, so sudden flash floods occur. Agricultural sector is also suffering due to the global warming effects. This will also affect the productivity of grains worldwide. Climate changing increases land and as well as sea temperature and alters precipitation quantity and patterns. This paper elaborately presents the current situation of climate changing and the causes of its vulnerable effects, on humanities and also discussed about the mitigation action of climate change as to how control the disaster.

Keywords: Climate change, Global threat, Carbon emission, Green house gas, Mitigation of climate change

1.0 Introduction

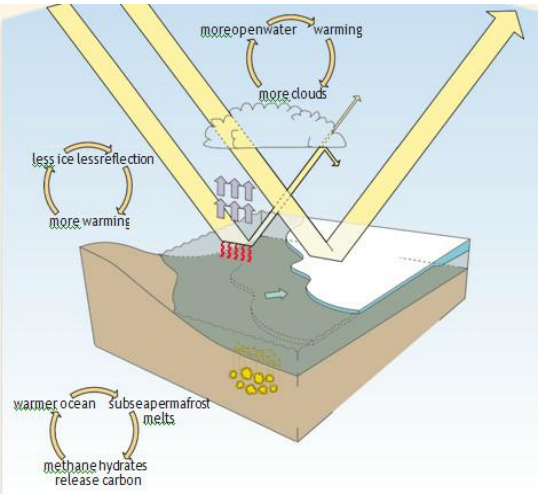
Glacier and ice melting are occurring far above normal changes at an accelerating pace. It is happening in all snow- and ice-covered regions: Antarctica, the Arctic, Greenland, the “third pole” of the Himalayas, and other glaciated areas throughout the world. The consequences for the regions affected are already considerable and more are expected. However, the melting is not only an issue for the areas where it occurs. Glacier, snow and ice are important components of the Earth’s climate system. Melting will be felt in all regions of the world through increased global warming and not only rising sea levels, but creating something new phenomenon may be named as green vapors settling in the sky. Moreover, the loss of summer ice cover on the Arctic Ocean is leading to greater absorption of heat from the Sun. This is thawing the permafrost surrounding the Arctic and threatening the release of very large quantities of additional carbon dioxide and methane to the atmosphere. In this paper, we are trying to bring the attention of the globe affected by melting snow and ice to the plight of the cryosphere in the seminars as Melting Ice: Regional Dramas, Global Wake-Up Call. It is also likely to be summarized, that how fast this melting is occurring, and how it will affect Climatic change on the earth.

Snow and ice on land in the sea and in the ground are part of what is known as the cryosphere. Snow and ice are important components of the Earth’s climate system and are particularly

vulnerable to global warming. Reduction of snow and ice contributes to an acceleration of global warming through feedback processes. Loss of snow and ice will impact the cultures and livelihoods of people around the world.

2.0 Changes in snow and ice affect the global distribution ofheat

Snow and ice reflect most solar radiation back to space, while open sea and bare ground absorb most of the solar radiation as heat. When snow and ice disappear, the areas normally covered will warm, contributing to further melting and warming through a self-reinforcing effect. Large amounts of methane and carbon dioxide (CO_2) are stored in the world's permafrost regions. When frozen ground thaws, these greenhouse gases are released into the atmosphere, another self-reinforcing effect that may amplify global warming. Melting of sea and land ice influences ocean temperature and salinity, which are important factors in the development and movements of the major ocean currents. Any changes to these may significantly alter the ocean current system and the global transport of heat **[1-13].**



3.0 Changes caused by melting snow and ice affect people's homes and livelihoods worldwide

Sea level rise is one of the most obvious consequences of melting ice on land. Even quite minor melting of ice masses will have major consequences for people and infrastructure in coastal communities, cities, and states. Melting of high mountain glaciers can have consequences for the availability of water for agriculture, domestic use, hydroelectric power stations, and industry. Melting of high mountain glaciers can also lead to hazardous conditions, particularly in the form of glacier lake outburst floods, which can significantly impact human populations and activities **[14-18].** The ecosystems and biodiversity in polar and mountain regions can change significantly as snow and ice cover diminishes. People depending on the natural resources of these regions will need to adapt to these changes. Access to resources may become easier as snow and ice disappear, but may also lead to challenges with respect to safety and pollution issues. In the Arctic Ocean, for example, sea ice is the main barrier to maritime transport and access to oil and gas resources [**19-23].**

4.0 Climatic Impact in India

Asian regions especially India is surrounded by three (3) sides from sea and 4th side from Himalayan hills may cause heavy loss to the livelihood, already mentioned in the book written by author of this paper (reference **Global Warming - Causes, Impacts and Remedies,** ISBN 978-953-51-0934-1, *Published in April 2015 by InTech, Rijeka, Croatia Page 39-40,* Chapter Title: Study of Impacts on Continue Shrinkage of Arctic Sea & Sea Level Rise)

Now we are facing excessive rainfall from West Bengal to Gujarat affecting 300-500 Kms from coastal area and himalya's ice sheets are collapsing causing clouds worst. A records of major cyclonic impact since 2013-14 onwards are listed below:

1) **Kedarnath Tragedy**

It was devastated on 16th evening–17th morning (June 2013) due to landslides and flash floods that killed more than 5000 people in Uttarakhand.

2) **Cyclonic Storm Phailin in Odisha, October 12, 2013**

The severe cyclone storm "Phailin" that hit the coast of Odisha on October 12, 2013, brought with it very high speed winds and heavy rainfall that caused extensive damages particularly to houses, standing crops, power and communication infrastructure in the coastal districts of the state.

3) **Cyclonic Storm Hudhud in Andhra Pradesh, October 12, 2014**

On October 11, Hudhud underwent rapid intensification and developed an eye at its center. In the following hours, the storm reached its peak intensity with a minimum central pressure of 950 mbar (28.05 in Hg) and three-minute average wind speeds of 185 km/h (115 mph).

4) **Cyclonic Storm Nilofar in Gujarat, October 31, 2014**

The third-strongest cyclone in the Arabian Sea, in late 26-28th October 2014, reached peak maximum sustained winds estimated between 205 km/h (125 mph) and 215 km/h (130 mph).

5) **Severe Cyclonic Storm Chapala, Kerala, Maharashtra and Gujarat October 28, 2015**

The third named storm of the 2015 North Indian Ocean cyclone season, it developed on 28 October off western coast of India from the monsoon trough. Fueled by record warm water temperatures, the system quickly intensified and was named *Chapala* by the India

6) **Cyclone Titli in Odisha, Oct 11, 2018**

Cyclone Titli killed at least eight people in Andhra Pradesh and left a trail of destruction in Odisha after making landfall early today morning. Titli made landfall as a very severe cyclonic storm with wind speeds of 130-140 kmph.

7) **Phethai Dust storms to floods, Kerala, Dec 19, 2018**

Cyclone Phethai made landfall in Andhra Pradesh, displacing thousands of people. It comes just about a month after Cyclone Gaja devastated neighbouring Tamil Nadu, Kerala, and Pondicherry.

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9) **Cyclonic Storm Fani in Odisha May 03, 2019**

An enormous tropical cyclone made landfall in eastern India Friday near the coastal city of Puri, impacting an area that's home to tens of millions of people. It's believed the storm, called **Cyclone Fani** ("Foni"), struck the coast with winds in excess of 115

miles(175km) per hour (equivalent to a **Category 3 hurricane**).

10) **Cyclonic Storm Vayu in Gujarat, June 12, 2019**
Six million people could be affected by hurricane-strength Tropical Cyclone Vayu, which is barreling toward northwest India and will skirt the coastline of Gujarat beginning Thursday morning. **Almost 300,000 people are set to be evacuated to 700 shelter homes.** Schools and colleges in the area are closed. With winds of **170 kmph** (100 mph), Tropical **Cyclone Vayu** could become the strongest cyclone to strike northwestern India in decades.
11) **Cyclone Amphan Worst storm since 1737 hit Odisha & West Bengal (20-23 May 2020)**
12) Cyclone Amphan is the first cyclonic storm of the 2020 North Indian Ocean cyclone season and first 'super cyclone' to form over the Bay of Bengal since the catastrophic 1999. Extremely severe cyclone Amphan, packing winds of up to 190 kmph (121 mph) roared into West Bengal on 20 May 2020, dumping heavy rain and leaving a trail of destruction. At least 6.58 lakh people were evacuated in West Bengal and Odisha before the cyclone struck.
13) **Cyclone TAUKTUE influenced Karla, Karnataka, Goa, Maharashtra & Gujarat (13-19 May 2021)**
14) **Tauktae** began to parallel the coast of the Indian states of Kerala, Karnataka and Maharashtra, before rapidly intensifying into a very severe **cyclonic storm (15-19 May 2021)**,
15) **YAAS Odisha & West Bengal (23-28 May 2021)**
Sea water enters through boundaries of a house during **cyclone Yaas** landfall in Chandipur area of Balasore on May 26, **2021**. The **cyclone** caused major damage to the tree cover in Balasore and Mayurbhanj districts. Thousands of trees were reported to have fallen in Nilagiri area.

5. Global Status of Green Land (Island, Arctic and Antarctica Sea)

It is only 10% of EARTH Surface of 51.7 million sq.km and now:

1). North Pole Ice (lowest)

2021	1.384 million sq.km	17% ice left
2019	1.560 million sq km	30% ice left
2010	4.100 million sq.km	78% ice left against 5.17 million

2). South Pole Ice (lowest)
7.2 million sq km maximum and 1.1 million sq km lowest in summer

3). Average thickness of sheets is 4.8 km which can raise the sea water level 63 meter or 200 feet.

6. Disaster Management

It is known fact that a **disaster** is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources. Though often caused by nature, **disasters** can have human origins. There are three types of Disaster.

- **Natural -** Hurricanes, tornadoes, earthquakes, floods, volcanoes, fire etc.

- **Technological** - Chemical releases, power outages, natural gas explosions, etc.
- **Man-made** - Terror attacks, race riots, mass shootings, etc.

Disaster management aims to reduce the occurrence of disasters and to reduce the impact of those that cannot be prevented. It is to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. It requires government intervention and a proper planning as well as funding. It is not **necessary** that these disasters are always unpredictable.

7. Conclusion

The primary work is to keep society safe during a natural disaster, preparedness safety tips can prevent injuries and make the difference in an emergency:

- Stay informed. ...
- Have a plan for evacuation. ...
- Keep emergency utilities / kits on hand. ...
- Avoid unnecessary risks like: evacuating fisherman from
- Sea / social distances. ...
- Placing people or animals to the safest area / locked down in your home.

Thermal power generation is going to be reduced due to non-availability of coal by year 2045-50. We have to add more Renewable & Nuclear Power Station now. The Solar energy can be installed at Residential, Medical, Govt. buildings and Institutions buildings.

India is one of the fastest country to produce alternative power energy to the tune of **2,50,000** MW which can be fed in the power grid by 2025, although it is having potential of **800-1000** GW.

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