

SEC-2 Impacts of Climate Change

Model Prepared by- Syfujjaman Tarafder, Gour Mahavidyalaya, Malda

Effects of Climate Change

The effects of climate change are becoming increasingly evident day by day. Following are some examples:

A. Rising Temperatures

One of the most visible effects of climate change is the rise in global temperatures. The global average temperature has increased by approximately 1.1 degrees Celsius since the preindustrial era, and the past decade has been the warmest on record. (NASA) Here are some of the impacts of rising temperatures:

- **Heatwaves:** Heatwaves are becoming more frequent and intense in many parts of the world. For example, the 2019 European heatwave broke temperature records across the continent and caused an estimated 2,500 deaths. (World Meteorological Organization)
- **Extreme Weather:** Climate change is increasing the frequency and intensity of extreme weather events such as floods, hurricanes, cyclones, and typhoons. For instance, Hurricane Harvey in 2017 caused \$125 billion in damages in the United States. (National Oceanic and Atmospheric Administration)
- **Melting of Glaciers:** Rising temperatures are causing glaciers and ice sheets to melt at an alarming rate. For instance, the Greenland ice sheet has lost an average of 286 billion tons of ice per year between 1993 and 2016. (NASA)

B. Changes in Precipitation Patterns

Climate change is altering precipitation patterns, leading to more frequent and severe droughts, floods, and other extreme weather events. Here are some of the impacts of changes in precipitation patterns:

- **Droughts:** Climate change is making droughts more frequent and severe in many parts of the world. For instance, the 2011-2017 drought in Syria was the worst in recorded history and led to the displacement of millions of people. (World Bank)
- **Floods:** Climate change is increasing the risk of flooding in many regions. For instance, the 2010 floods in Pakistan affected 20 million people and caused \$9.7 billion in damages. (United Nations)
- **Food Insecurity:** Changes in precipitation patterns are affecting crop yields and leading to food insecurity in many regions. For instance, the 2019-2020 locust infestation in East

Africa was exacerbated by climate change and led to a food crisis affecting millions of people. (Food and Agriculture Organization of the United Nations)

C. Sea Level Rise

Rising temperatures are also causing the oceans to warm and expand, leading to a rise in sea levels. Global sea levels have risen by approximately 20 centimetres since the late early 20th century, and the rate of sea level rise is accelerating. (Intergovernmental Panel on Climate Change) Here are some of the impacts of rising sea levels:

- **Coastal Flooding:** Rising sea levels are increasing the risk of coastal flooding and storm surges. For example, a one-metre rise in sea levels would put over 150 million people at risk of flooding in coastal cities. (Intergovernmental Panel on Climate Change)
- **Salinization of Groundwater:** Rising sea levels can cause saltwater to infiltrate coastal aquifers, making the groundwater saline and unusable for agriculture and drinking. (United Nations)
- **Displacement of Communities:** Rising sea levels are forcing some communities to relocate as their homes become inundated. For instance, the residents of the Carteret Islands in the Pacific have been forced to leave their homes due to rising sea levels. (United Nations).

D. Ecosystem Changes

Climate change is causing significant disruptions to ecosystems and threatening the survival of many plant and animal species. Here are some of the impacts of biodiversity loss:

- **Extinction of Species:** Climate change is increasing the risk of extinction for many species, with estimates suggesting that up to one million species are at risk of extinction due to climate change. (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services)
- **Coral Bleaching:** Rising temperatures are causing coral reefs to bleach and die at an alarming rate. For instance, the Great Barrier Reef has lost 50% of its coral cover since 1985 due to coral bleaching caused by rising temperatures. (Australian Institute of Marine Science)
- **Changes in Migration Patterns:** Climate change is altering the migration patterns of many species as they seek more hospitable environments. For instance, the Arctic sea ice is melting at an alarming rate, causing many species such as polar bears to struggle to find food and habitat. (National Geographic)

E. Economic Impacts

Climate change is having significant economic impacts worldwide, affecting industries, businesses, and communities in various ways. Some of the economic impacts of climate change are as follows:

- **Damage to Infrastructure and Property:** Climate change has led to an increase in the frequency and severity of natural disasters such as floods, hurricanes, and wildfires. These disasters cause significant damage to infrastructure and property, resulting in substantial economic losses. For example, Hurricane Katrina, which struck the US Gulf Coast in 2005, caused an estimated \$125 billion in damages.
- **Impact on Agriculture and Food Security:** Climate change is altering weather patterns, resulting in changes in precipitation, temperature, and humidity. These changes are affecting agricultural production, leading to crop failures, reduced yields, and food shortages. For example, the prolonged drought in California, which began in 2012, resulted in \$3.8 billion in agricultural losses.
- **Reduced Labor Productivity:** Rising temperatures and extreme weather events can reduce labour productivity, especially in industries such as agriculture, construction, and mining. For example, during heatwaves, outdoor workers are more likely to suffer from heat exhaustion and heatstroke, reducing their productivity and increasing the risk of accidents.
- **Impact on Tourism:** Climate change is affecting the tourism industry, with rising temperatures, sea level rise, and changes in precipitation patterns affecting popular tourist destinations. For example, the Great Barrier Reef in Australia is experiencing coral bleaching, which is impacting tourism and the local economy. In the United States, national parks are experiencing reduced visitation due to wildfires and other climate-related impacts.
- **Increased Insurance Costs:** Climate change is causing an increase in the frequency and severity of natural disasters, which is leading to higher insurance costs for businesses and individuals. For example, after Hurricane Harvey in 2017, insurance claims in Texas alone were estimated at \$19 billion.
- **Impact on Energy and Resource Extraction;** Climate change is affecting the energy and resource extraction industries, with rising temperatures and extreme weather events disrupting production and supply chains. For example, in 2021, the extreme cold weather in Texas caused significant disruptions in oil and gas production, resulting in a loss of production and revenue for energy companies.

F. Human Health Impacts

Climate change is also having significant impacts on human health, including increased risk of heat-related illnesses, respiratory problems, and the spread of infectious diseases. Here are some of the impacts of climate change on human health:

- **Heat-Related Illnesses:** Rising temperatures are increasing the risk of heat exhaustion, heatstroke, and other heat-related illnesses. For instance, the 2003 European heatwave caused an estimated 70,000 deaths, mostly among elderly people. (World Health Organization)
- **Respiratory Problems:** Climate change is increasing the concentration of air pollutants such as ozone and particulate matter, which can exacerbate respiratory problems such as asthma. For instance, air pollution is estimated to cause 4.2 million premature deaths each year. (World Health Organization)
- **Spread of Infectious Diseases:** Climate change is altering the distribution of many infectious diseases, such as malaria and dengue fever, as the insects that carry them migrate to new areas. For instance, the incidence of malaria has increased in many highland regions of East Africa due to rising temperatures. (World Health Organization)

Conclusion

Climate change is one of the most significant challenges facing humanity today, and its impacts are becoming increasingly evident. While natural factors such as solar radiation, volcanic activity, and changes in the Earth's orbit have contributed to climate change in the past, human activities such as burning fossil fuels, deforestation, and industrial activities are the primary cause of recent climate change. It is essential that we take action now to address the causes of climate change and mitigate its impacts. This will require a concerted effort from governments, businesses, and individuals around the world to reduce greenhouse gas emissions, invest in renewable energy, and promote sustainable practices. Only by working together can we ensure a livable planet for future generations.