Date:
Day: M T W T F S S

Q: Discuss in detail the effects of climate change keeping in view the rising flooding in the world ~~and give the world~~ and give the appropriate measures to counter urban flooding.

Introduction:

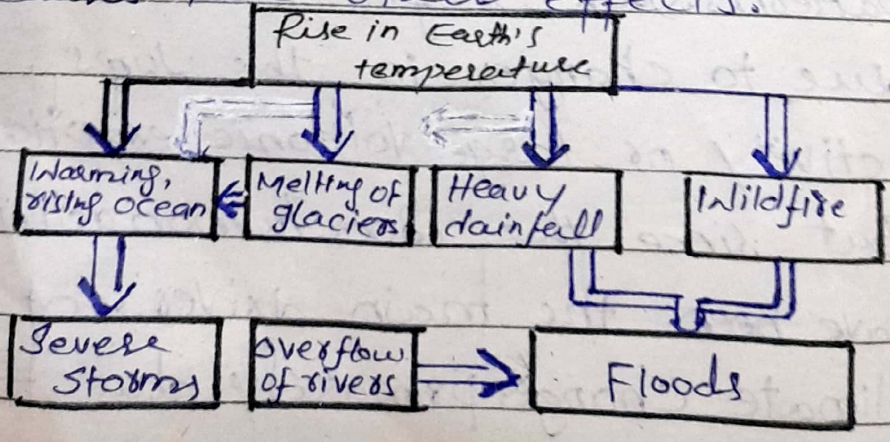
"Climate change does not respect borders; it does not respect who you are, rich or poor, small and big. Therefore, this is what we call "global challenges" which require global solidarity."
(Ban Ki-Moon)

Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural due to changes in the sun's activity or large volcanic eruption. But since the 1800s, human activities have been the main driver of climate change, primarily due to

the burning of fossil fuels like coal, oil and gas. This change causes rise in earth's temperature, intense drought, water scarcity, severe fires, rising sea levels, melting glaciers, catastrophic storm and declining biodiversity. ~~Some of these~~ effects are interlinked with each other causing the major disaster like flooding. Mitigation should be taken to overcome the rise of flooding.

Effects of Climate Change

Change in climate pattern affects every aspect of life. The major effect of climate change is rise in Earth's temperature which causes the other effects.



Date:
Day: M T W T F S S

1. Rise in Earth's Temperature:

Change in climate pattern causes rises in global average temperature near Earth's surface. This global warming is a direct threat to life. This leads to heat waves which are intensifying across the globe and specially in Europe.

→ The rise in temperature continuesly from 1850-2022

→ currently recorded rise in temperature 1.2C° → as per **IPCC**

→ in the most recent case July 2023 reported as the ever warmest month and ~~July 4~~, July 3 was the hottest day recorded globally (According to data from the U.S National Centers for Environmental prediction).

Antonio Guterres Secretary General of US Stated: ⇒ The era of global warming has ended; the era of global boiling has arrived.

2. Warming and rising ocean:

The ocean warms due to an increasing global temperature, seawater expands, taking up more space in the ocean basin and causing a rise in water level. It causes destructive erosion, wetland flooding, lost of habitat for fish birds and plant and it also causes storms.

=> Global tidal records from 1900 to 1990 show an estimated **four to five inch** rise in global mean sea level.

=> Currently, sea level is rising about **one eighth of an inch** per year but it is projected to rise in the future.

3. Severe Storms:

Rising global temperature creates warmer oceans and in turn, warmer and wetter ocean breezes. These factors feed tropical storms and create longer, more destructive

Date:
Day: M T W T F S S

hurricane seasons.

=> The 20s saw twice as many tropical cyclones as the 1980s and nearly ten times as much related property damages => $476 billion compared to $41 billion.

4. **Melting glaciers:**

Glaciers act as reservoirs of water that persist through summer. 79% of fresh water exist in the form of glaciers. Rising earth temperature causes rapid melting of glaciers, calving off into the sea and retreating on land. It causes scarcity of fresh water and has great effect on agriculture.

As per international commission on ice and snow

African glaciers 82% glaciers retreat

New zealand glaciers retreat 11%

=> Pakistan (Himalayan Glaciers) are the most rapidly melting

Date:
Day: M T W T F S S

glaciers right now in the world as per NASA

5) Heavy Rainfalls:

Rising temperature of earth warms up the ocean causing more water to evaporate into the air forming clouds. The clouds result into heavy rainfall which causes floods and affect the agriculture sector.

=> On July 6, 2023 over the course of just 10 hours, Lahore received an astonishing 290mm of rain.

6) Wildfire:

Due to heatwaves the fire starts flaming in the forest which within no time spread all over the forest causing deforestation. Lack of trees causes more rise of temperature in the earth.

=> Asia, Europe, North America, US, South America => have faced wild fire recently in 2023

Date:
Day: M T W T F S S

=> In August 2023, the wildfire in Hawaii killed at least 106 people and displaced thousands on the Hawaiian island of Maui. At least 2,200 buildings, including homes, schools, and places of worship have been destroyed or damaged in the fires.

7. **Floods:**

Rise of earth temperature causes rise in sea level, melting of glaciers, heavy rainfall wildfire and these all result to flood. As due to melting glaciers and rise in sea level it causes overflow of water which ultimately causes flood. Due to wildfire there will be lack of trees and trees' roots are the source of absorbtion of water, due to lack of trees the soil got loose and does not absorb rainfall's waters and

Date:
Day: M T W T F S S

the water flows on the surface of the earth causing flooding.

=> According to the National Disaster Management Authority (NDMA),

=> A total of 192 people died since 25 June as a result of flood, 283 have been injured and 3,280 houses have been damaged.

=> ~~The~~ Heavy rainfall during the 2023 monsoon season resulted in severe flooding and landslides across northern India, ~~primarily~~ causing at least 88 died, more than 100 injured

"Measures to Counter Urban Flooding"

Urban flooding occurs when city landscapes cannot absorb excess water after prolonged periods of intense rainfall, river overtopping or storm surge. It threaten lives, inundate properties and business, destroy belongings

Date:
Day: M T W T F S S

damage vital infrastructure and prevent access to essential public services. It poses significant social and economic risks to cities around the world.

⇒ They have caused more than $1 trillion in economic damage since 1980 and most cities (91% of 640 member cities) are impacted by them. Climate change is making this situation worse.

Measures:

⇒ Avoid new development on wetlands and floodplains as much as possible, ensuring that any new development in these zones is adapted to reduce flood risk.

⇒ Increase the natural space along riverbanks and in floodplains to enable safer riverine flooding.

⇒ Replace impermeable surface across the city with permeable, ideally green options. This will reduce and

Date:
Day: M T W T F S S

slow water runoff by increasing water infilteration (drainage into the surface) and retention (storage on or under the surface) across the watershed.

- Create basins or small reservoirs to retain rainwater in the city.
- Construct large-scale, underground rainwater retention tanks.
- Reduce debris and waste in the drainage system to reduce blockage.
- Construct building scale rainwater tanks, green walls and other building-scale green infrastructure such as green roofs. Building-scale rainwater retention tanks collect rainwater runoff from roofs to reduce the amount of water that flows into the city's streets and water ways.
- Work with neighbouring municipalities and regional/national authorities

to reduce and slow the flow of flood water from beyound city boundaries.

=> To avoid urban flooding due to rainfall, it is important for water and sewer management authorities to revamp the underground pipes and drainage system to ensure the sewers do not get backed up during the moonsoon season. Moreoversinstalling new pipelines to separate rainwater from wastewater can be a good decision.

Conclusion:

Climate change has become a threat to existence of life on the earth. Immeasurably, it is the result of humans own irresponsible activities. Simply, human beings themselves have become threat to their lives. So, for its prevention, every Individual have to play their part.