

The threats of global warming and Ways to Counter it

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3) Threats of global warming

3.1) Extreme weather patterns and climate variations

a) Flash floods: In 2022, devastating floods in Pakistan leaving 33 million people affected and caused \$40 billion damage.

b) Wildfire

c) Droughts: 0.1°C rise in global temperature cause 7% increased moisture absorption capacity of atmosphere, leaving lands dry.

d) Tornadoes & Cyclones

e) Glacier melting: $\frac{1}{3}$ rd of land covered by ice sheets and glaciers is projected to ablation till 2100 due to global warming

3.2) Shortage of Food and Water Scarcity

- a) Price hike of food due to supply disruption
- b) Decline in nutritional value due to prolonged heating
- c) Pest outbreaks due to warmer atmosphere
- d) Retreat of glaciers
- e) Profound loss in fisheries industries
- f) Water cycle disruption
- g) Erratic Precipitation Patterns

3.3) Human Health deterioration

- a) Exacerbating diseases due to malnutrition, water borne diseases, prolonged heat cause aging
- 2, 50,000 deaths annually due to heat stress (WHO)

3.4) Ecosystem and Biodiversity loss

- a) Marine, freshwater, terrestrial habitats deterioration
 - b) Unprecedented threats to coral reefs: provide shelter to 25% marine life
 - c) Extinction of marine and terrestrial reptiles and mammals
- ### 3.5) Ways to Counter global warming

4.1) Decarbonization a crucial strategy to mitigate global warming

- a) Reducing carbon footprints
- b) Sticking to carbon budget approved by Paris agreement
- c) Harnessing renewable energy resources by curtailing fossil fuel consumption

d) Reforestation and afforestation

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4.2) Population control can serve as measure to curb global warming

- a) Reduce in energy demand
- b) Limit Fossil fuel consumption
- c) Minimizes waste generation
- d) Reduced pressure on natural resources & ecosystem

4.3) Implementing effective policy frameworks

a) Carbon-taxation on high emitting nations

b) Imposing cap and trade strategy effectively

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We are the first generation to feel the effect of climate change and the last one who can do something about it. The stark reality, stated by Barack Obama, underscores an unprecedented moral responsibility on our shoulders to overcome the threats of global warming. The earth is enduring an alarming surge in temperature, posing great risk to ecosystem. The threats posing by global warming are extreme weather variations and accelerated climate change such as flood, severe droughts, water scarcity, food shortage, impacts on public health, loss of biodiversity, and ecosystem. These multifaceted and persistent challenges can be effectively addressed through decarbonization measures, such as carbon pricing and carbon footprints, curtailing fossil fuel consumption, reforestation, control on population explosion, integrated policy frame works and closing existing policy gaps. Addressing global warming is no longer a matter of choice but an urgent obligation, for the actions we take today will decide the livability of our planet for generations to come.

To mitigate the threats of global warming several agreements initiated but couldn't achieve their objectives. But among those Paris agreement was successful, with 195 countries reaching a consensus on its objective. It was adopted in 2015 under the UNFCCC, marked a historical milestone to combat the global warming.

The ultimate goal was to reduce the ^{rise in} average global temperature to well below 2°C or upto 1.5°C from pre-industrial level. Despite, each country emphasizes on implementing its nationally Determined Contribution (NDCs), the world is still rapidly depleting its carbon budget.

IPCC (Intergovernmental panel on climate change) in 2018 projected 420 billion tonnes of CO_2 was likely to be emitted with 67% probability to limit global surge in temperature of 1.5°C . But according to a recent report, 80 billion tonnes remaining till we cross the limit till 2030. If this surge in global temperature continues, the survival of life on earth would be untenable.

Although, the international agreements like the Paris agreement stick the world to making concerted efforts toward climate stability, the escalating threats of global warming continues to intensify. Among those threats, extreme variations in climate and changing patterns of weather posed grave menaces. The drivers of climate variation and shifting of weather patterns bring devastating flash floods.

In 2022, Pakistan faced one of the grim devastation due to flash floods which caused \$40 billion damage and 33 million people were displaced.

The major drivers behind this horrendous event was global warming which lead to ablation of polar ice caps, ice sheets and melting of glaciers. Moreover, the level of

Sea rises and contributes to catastrophic floods. In addition, the warming of Oceans is another contributing factor to global warming and floods. According

to NOAA, Oceans contribute 0.5°C rise in global temperature surge alone via evaporation. So, if even global efforts succeed to

net zero carbon emission, ocean warming solely a key driver in global warming. Due to continuous uprise of temperature since the industrial revolution, the earth becomes 0.1°C hot and it added more moisture to the atmosphere from the evaporation of moisture leading to land dryness and desertification. The land dryness significantly poses threat to agriculture industry, leading to food shortage. Further, it leads to prolonged droughts and adversely effects the fisheries industry, undermining both livelihoods and food security.

Water scarcity is another grave concern ^{arising} from global warming. According to UN, 0.5% of available freshwater is safe for use. This static highlights how limited our supply of accessible fresh water really is, especially as climate change exacerbates water stress. Beyond water scarcity, global warming escalates the frequency and severity of extreme natural hazards encompassing wildfire due to sudden surge in temperature, hurricanes, tornadoes and cyclones which inflicts rampant ecological & and

Socio-economic damage. Apart from these devastating impacts, global warming exerts profound effects on food chain, including sudden price hike resulting from economic damage, prolonged heat reducing the nutritional value of food. Moreover, hot climate creates favourable conditions for agrarian pests outbreak that severely impact crop yield. A Stanford University Study (2025) found that rising heat and dry air have significantly reduced yields of staple food. This report depicts the havoc of global warming on the crops that are primarily important for human survival. So, the climate change and shifts in weather pattern are a major threat of global warming, inflicting grave impacts on livelihoods worldwide.

Beyond its economic and environmental consequences, global warming poses a profound threat to public health worldwide. Rising food prices and declining nutritional value of staple foods cause malnutrition. According to WHO, climate change is expected to cause an additional 2,50,000 deaths annually between

between 2030 - 2050, primarily from malnutrition, malaria, diarrheal diseases and heat stress. Flood events, intensified by shifting weather patterns, facilitate the spread of waterborne illnesses such as malaria, typhoid, dengue, diarrhea, cholera and hepatitis.

In addition, prolonged heatwaves exacerbate cardiovascular and respiratory diseases, particularly among elders, while also accelerates

dehydration and heat-related illnesses in working populations. A biological

study illustrated the effect of prolonged heat on the age-factor, which is equivalent to smoking effect. Thus, prolonged heat stress is another menace which significantly impacts not on the economy but

also an escalating global health emergency. It demands urgent adaptation measures within the healthcare system alongside broader climate mitigation efforts.

Alongside, the impacts of global warming on public health, it is also driving an alarming decline in biodiversity and ecosystem.

Biodiversity and ecosystem are the vital organs of planet's

environment. Millions of species fundamentally depends on the integrity of biodiversity and a healthy ecosystems, and both of which are equally threatened by the global warming. According to a study, 6.23 million species uptill now are gone extinct due to global warming including zanzibar Leopard. When food supply chain disrupts and globally surge in temperature drives flash floods and other destructive calamities, numerous terrestrial animal species face accelerated risks of extinction. In addition, marine species are extremely vulnerable to the impacts of global warming, particularly coral reefs which serve as the habitat for 25% of marine life are now experiencing severe degradation due to ocean warming. Thus, the degradation of these ecosystems not only endangers the valuable species that are vital part of lifecycle but also compromises the ecological services on which human survival depends, such as fisheries, coastal protection from erosion, flooding and storm surges and carbon sequestration. Such

losses underscores that biodiversity decline is not merely an environmental threat but also a direct threat to food security, economic stability and climate resilience.

In the light of these challenges, the responsibility to address these multifaceted threats lies with the community to adopt comprehensive measures. The key driver of global warming is the excessively carbon emission in the ^{atmosphere} environment which makes it vulnerable to deadly havocs. These catastrophic events facilitates the deterioration of socio-economic stability, undermining livelihoods and straining national economies. The key approaches to counter this menace are reduction in carbon emission, declining carbon footprints, penalties on the signatory countries for violating the Paris Agreement reforms. Harnessing renewable energy resources by cutting fossil fuels is extremely a productive step towards curtailing Green House Gases. GHGs entails Sulphur, nitrogen, ozone gases and chloroflorocarbons which are the main sources of

global warming. In addition, a collective strive to reduce carbon footprints by carpooling, walking, utilizing public transport and using lead free petrol can significantly contribute mitigate global warming. Adhering to the global carbon is essential to limiting temperature rise within the 1.5°C threshold outlined in the Paris agreement. The reversal of carbon in the atmosphere is far more expensive, technological challenging and time-consuming than adopting proactive measures.

Utilizing energy efficient appliances is another effective measure to curtail carbon emission and conserve resources. Simple household adjustments, such as switching to LED lighting, investing in high efficient cooling and heating systems can collectively make a measurable impact when adopted on large scale.

Thus, at the individual and community level, a collective commitment to reducing carbon footprints can yield substantial progress for curbing global warming.

Apart from these measures, nature based approaches can play a powerful role in restorative actions. According to a study, trees are a greater source of carbon sink. Reforestation and Afforestation can play indispensable role for mitigating potential risk of global warming which facilitates socio-economic deterioration. Furthermore, forests can combat desertification, soil erosion and water runoff to oceans. China's Great Green wall initiative combat desertification and restore ecological balance as it planted 66 Billion trees.

Moreover, Vegetation such as mangroves, marshes, Seagrasses, Swamps are highly effective carbon sink. They act as a buffer against extreme weather and natural shield against storms. Furthermore, these practices support biodiversity

conservation and protect climate induced disasters. Thus, ecosystem against integration of afforestation and deforestation policies address carbon emission and environmental resilience issues.

Beyond these key measures, controlling population explosion is another critical strategy in mitigating global warming. Rapidly increasing population can put immense pressure on natural resources, energy demand and utilizing fuel-based transportation. Population density accelerates urbanization, fossil fuel consumption, deforestation resulting in food insecurity, water scarcity, Green House Gas emission, intensified pollution and deterioration of health at high frequency. In the context of Pakistan, controlling population is an unmet need, as the country's annual growth rate is 2%. This rapid acceleration of population exerts tremendous pressure on country's natural resources which facilitates global warming. Thus, implementing family planning policies and educating people by raising awareness can mitigate the risks of global warming.

Last but not the least, integrated policy frameworks and implementation of already existing policies could be a great stride in combating global warming.

Implementing carbon taxation and rigorously following of cap and trade strategy could serve as a key measure. In addition, intercountry coordination and providing funding to developing countries could reduce the potential risk of surging of temperature. From individual level to collective action can shift the dynamics of world. It is a firm believe the focusing collective strides always bring impactful and lasting results in confronting global challenges.

In essence, global warming stands as the most pressing concern of contemporary era. It exerts profound impacts on ecosystems, economies and livelihoods. From extreme weather variations and climate change, deterioration of public health, unprecedented food shortage, water scarcity and loss of biodiversity and ecosystem, its threats are multifaceted and far-reaching. While the scale of challenges is massive, to address these challenges several productive solutions ranging from

decarbonization, renewable energy resources, controlling population explosion, implementing carbon mitigation policy frameworks, natural strides such as afforestation and deforestation and collective action of individuals and at community level could serve as potential drivers for overcoming global warming threats. The success of international agreement i.e., Paris agreement demonstrates that coordinated global action can drive meaningful progress. The responsibility now lies with every nation, community and individual to act decisively for the decisions made today will define the quality of life in future.
