

Q: Discuss in detail the climate mitigation and adaptation strategies keeping in view the climate change risk index of Pakistan.

Climate Mitigation and Adaptation Strategies for Tackling Climate Change of Pakistan

Climate Mitigation strategies are defined as broad range of policies, practices and technologies aimed at reducing Greenhouse gas emissions in Earth's atmosphere to mitigate the effects of climate change.

The climate adaptation strategies involve adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects, which harms or exploits beneficial opportunities. These strategies are crucial for reducing vulnerability to climate crisis and enhancing the resilience of communities to the impacts of climate change.

Climate Change Vulnerability of Pakistan

Pakistan is ranked as 5th most vulnerable country to climate change according to Global Climate Risk Index. This shows that the country will experience extreme weather events such as floods of 2022. Due to these severe climate crisis, Pakistan has lost nearly ten thousand lives and economic losses worth \$3.8 billion throughout the years 1999 to 2018. Moreover, the escalating climate crisis in recent years in form of floods of 2022 has caused total loss of \$15.2 billion.

Holistic Approach in Tackling Climate Change of Pakistan

a. Transition in Energy Systems

The climate crisis of Pakistan can be mitigated by making transitions in Energy systems from non-renewable to renewable energy sources. Recently, Pakistani government has signed MOU with Chinese firm \$200 million

to convert thermal power plant into solar power plant (tribune, transition to solar energy in Pakistan, April 2024).

b- Transition in Transport systems

Pakistan can mitigate environmental issues by improving its public transport. Although Lahore's investment in mass transit system in the form of Metro buses (Green line) and Metro Train (Orange line) along with the feeder bus network are vital ^{steps} for the uplift of public transport. But still the government needs to take more effective steps to reduce vehicle emissions. Pakistan's public transport is still suffering a lot; for instance, the report of Japan International ^{Cooperation} Agency (JICA), Karachi needs 10,000 new city buses so government ^{only} needs to make more efforts to promote public transport in public.

c- Increasing Forest Cover

The rapid increase in heat waves can be mitigated by increasing forest cover. The US Department of Agriculture reported that a mature tree absorbs 22 kg of CO₂ annually. So, Pakistan requires 108 mature trees to neutralize the carbon footprint of one car. Thus, government must initiate plantati-
-on drives across the country. For instance, Billion Tree Tsunami project planted more than 2.5 billion trees.

Promoting Sustainable Industrialization

In Pakistan, the government has taken significant step for promoting sustainable industrialization by implementing carbon policy that involves taxation ^{on} of carbon-emissions of industries. The primary objective of this step is to tap investment opportunities within global carbon market regarded as the world's largest market with an estimated value of **\$3 trillion** (BBC, taxations on carbon-emitting industries, June 2023).

e. Promoting Sustainable Urbanization

Pakistan has highest rate of urbanization in South Asia which is the leading cause of deforestation, (global w) climate change and unpredictable weather events of Pakistan.

These issues can be mitigated through infrastructure development for promoting sustainable urbanization. The government is taking steps to utilize CPEC for this purpose. Infrastructure development under CPEC offers an opportunity to integrate green principles into urban planning and construction practices (Saher Liaqat, Green CPEC, March 2024).

f. Proper Solid Waste Management

The growing air pollution, water and land pollution can be controlled by proper solid waste management. Recently, it is outlined that the government of Punjab has ordered that solid wastes would be treated meticulously.

Moreover, decision is made to establish 23 land-fill sites and 66 transfer stations at all divisional headquarters across the province to improve this management (Dawn, Solid Waste Management in Punjab, April 2024).

Moreover, it is also decided to establish solid waste energy plant in Quetta.

g. Promoting Environmental Awareness in Public

Pakistan ranked sixth globally and third in Asia among plastic waste generators with country producing about 30 million tons of solid waste annually. The best way to control this pollution is to raise environmental awareness in public. People must be education about the consequences of burning and dumping of wastes, use of plastics, effects of their vehicle emissions etc. Its best example is of Kigali that has successfully achieved a clean environment by the principle of "Umuganda" (meaning contribution).

Improving the role of Environmental Institutions

Pakistan is facing severe climate crisis but these can be addressed by improving the role of environmental institutions like EPA, Ministry of Climate Change, Pakistan Agriculture Research Council etc. These institutions should be strengthened enough to cooperate with UN-Habitat of Pakistan because UN-Habitat is actively addressing impacts of climate change in Pakistan. It is also supporting government in achieving sustainable ~~cities~~ cities (SDG11) in line with New Urban Agenda. Thus, by aligning environmental institutions with UN-Habitat climate crisis can be handled.

i. Improving the role of Disaster Risk Management

Climate change is a global issue but the reason due to which Pakistan is suffering a lot due to rapid famines, floods, hails, heatwaves, is the poor disaster risk management. For instance, the floods of 2022 had such repercussions that could not be addressed properly till today just because of weakness of DRM of Pakistan. According to reports of WHO, due to weak Disaster Risk Management structure the floods of

2022 have caused 3.5% increase in dengue cases, 3% increase in malarial cases and 3% increase in typhoid cases in flooded areas of Pakistan (Health Problems in Pakistan, 2023).

j- Improving Cooperation with other States

For sustainable urbanization, China has introduced sponge cities and there has been a cost of \$50 million on one sponge city; but Pakistan can not afford it so in order to attain sustainable development Pakistan must improve cooperation with other states.

For instance, Chinese company has recently delivered 160 high-end pure electric buses as part of CPEC. Moreover, notable progress has been achieved in green energy projects like **Karot Hydropower Project** which includes biodiversity management plan. China's move towards greener policies and heightened investment in renewables within CPEC provides optimism for sustainable future.

CONCLUDING THOUGHTS

Climate change poses a formidable challenge for Pakistan. However, amidst these adversities, lies an opportunity for resilience. By implementing robust strategies, Pakistan can mitigate the impacts of climate change and safeguard its people and ecosystems. With coordinated efforts from government, industry, and civil society, Pakistan can navigate challenges of climate change.