

Topic: Pakistan climate and sustainable
Crisis: challenges and solutions

Outline

I. Introduction

Pakistan has ranked among the top ten climate vulnerable countries due to the drastic impacts of climate change. Rapid melting of glaciers, infrastructure and agricultural losses, among others. However, Pakistan needs to take robust action to overcome the menace of climate change.

II. Manifestation of Climate Change

III. Impacts of Climate Change on Pakistan's Fragile Economic System

A. Political - level of threats imposed by Climate Change

a. It hampers unity between center and provinces due to water scarcity.

eg. 1) Sindh and Punjab water dispute

b. Political instability due to lack of climate finance

i) Pakistan and IMF deal and its conditionalities

c. It triggered conflict between center and provinces and among provinces due to disproportionate impacts of climate change

i) Gilgit Baltistan demands \$4 billion

ii) Sindh wants adequate share in NFC

d. Conflict arises because of construction of dams

i) Basha Dam lack of buy

ii) Kalabang Dam refusal to build Sindh and KPK

DATE: _____

DAY: _____

B. Economic Vulnerability in the Face of Climate Change

- a. Loss of infrastructure and developmental project
i) \$58 billion loss - the floods of 2010-22 (WB)
- b. Climate change posed serious threat to agriculture sector
i) Declined in the yield of Rice, Cotton and wheat by 10%.
- c. Rapid melting of glaciers
i) 7000, glaciers decrease by 23% - (Dawn)
- d. Loss of biodiversity
i) Mangrove trees declined 75% (Dawn)

C. Social Impacts have posed by Climate Change

- a. Huge displacement of people
i) ~~From~~ More than Seven lakh people displaced - (2022)
- b. Spread of water-borne diseases
i) 60% diseases spreads due to climate change (WHO)
- c. It triggers poverty level of the country
i) 40% of population lives below poverty line (WB)
- d. Disruption of human activities
i) Flood smog of Feb-2024, closed business activities and school for one month.

IV Solution to Overcome the menace of Climate Change and Sustainable living standard for Pakistani masses

- a. Transition to renewable energy
- b. Preference to Sustainable development goals
- c. Infrastructure development
i) Chinese-model sponge cities

DATE: _____

DAY: _____

d. Sustainable and water resistant agricultural activities

i) Drip Irrigation system -

ii) water resistant crops rather than Cotton and Rice

e. Strengthen Early warning system mechanism

i) Efficient NDMA and DPMA2

ii) Safelives glacier surveillance system

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CONCLUSION

DATE: _____

DAY: _____

Topic: Pakistan Climate Crisis: Challenges and Sustainable Solutions

The bee is dependent on the flower to make honey; the flower is dependent on the soil, air and atmosphere, and the atmosphere is dependent on human interference. The domino ~~impact~~^{effect} of climate change have jeopardised the lives of human-beings and other creatures. Despite being contributing less than one percent Pakistan has ranked among the top ten climate vulnerable countries of the world. Rapid melting of glaciers, continuous floods, infrastructural loss, erosion of agricultural land and huge displacement of people are the clear impacts of climate change on Pakistan's already fragile economy. Furthermore, it has triggered hydro politics between countries. For instance, the recent, India's unilaterally suspension of Indus - water Treaty (IWT) has further strained the water relationship between the two arch-rival countries. Furthermore, Pakistan has faced billions in economic and infrastructural losses due to climate change. Lack of climate finance and weak disaster management system have further deepened the impacts of climate change. Therefore, Pakistan needs to take robust strategic solutions to overcome the menace of climate change.

DATE: _____

DAY: _____

Climate change is no longer just a looming threat; it is present reality of this era. Rapid melting of glaciers, severe heatwaves, scorching heat, continuous floods and mass displacement of people are the clear examples of climate change. According to the United Nations Environment Program (UNEP), more than 2 billion people were unable to acquire neat and clean water for domestic use. Furthermore, continuous wildfire across the world have jeopardised the biodiversity. For instance, the recent fire in Los Angeles destroyed millions hectares of greenery land and forest cover. Furthermore, both in 2024 and 2025, Mohenjodaro, in Pakistan has showed 52°C which is considered the record increase in temperature in the history of the country. Hence, climate change is considered the most horrible threats of the twenty-first century.

There are several impacts of climate change on the fragile existence of Pakistan. These are expressed below.

To begin with, political level of impacts imposed by climate change on Pakistan. It hampers unity between provinces due to water shortage. Water is an important ingredients of life with out adequate water living on this planet is impossible. However, climate

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DAY: _____

Climate change has dwindled the per capita availability of water in the country. Sindh, as a lower riparian province has claimed adequate share of water and refused to build new dams due to water scarcity in the province. Furthermore, according to the Indus River System Authority (IRSA), both Punjab and Sindh have faced 50% water shortages. It not only affects the relations among provinces but poses serious threat to the economic potential of the provinces. Hence, equal distribution of water is very necessary step to offset water disputes among provinces.

Moreover, Pakistan, already grappling with countless socio-economic problems, yet climate change has incurred billions in losses in every year. For example, Pakistan has acquired loan for economic purpose but this bailout is insufficient to mitigate climate induced losses. Furthermore, the International Monetary Fund (IMF), also imposed strict conditionalities which has further squeezed the economic resiliency of the country. For example, recently floods in Northern area, particularly Gilgit Baltistan have incurred Rs4 billion losses. Therefore, climate change has deep impacts to the overall economic system of the country. And government needs to adopt resilient mechanism to avoid itself from more distractions...

DATE: _____

DAY: _____

The disproportionate impacts of climate change have further strained the cordial relations between center and units among units. For example, Sindh, Balochistan and KPIL have demanded re-structure the National Finance Commission (NFC) award based on climate change and economy. However, both Punjab and Federal government refused these demands of provinces, which has led to political instability and pose a serious threat to national integration.

Additionally, building of new dams are crisis concern for Pakistan. Diamer-Basha dam and Kalabagh dam are the clear and solid examples of political carelessness and disunity between center and provinces. Both KPIL and Balochistan have condemned the construction of the Kalabagh Dam and claimed that both of the regions have faced water shortages due to the construction of this dam. Balochistan, as a lower riparian, claimed that the province already grapple with water related issues, if this dam is constructed the province has further indulged in water related issues. ~~KPIL and~~ Furthermore, KPIL and Sindh also deny construction of the dam. Diamer Basha dam is another bone of contention between federal government and Gilgit Baltistan. The local population demand political representation and royalty ~~from~~ from the federal government in consideration of indigenous resources and condemned the construction of the dam.

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Furthermore, Climate change is considered the biggest threat to development of infrastructure such as buildings, bridges and any other developmental projects. According to the United Nation Environment Program, (UNEP) the floods of 2010, and 22 have caused to \$58 billion losses for Pakistan. The floods of 2022, ^{were} destroyed Swat, hotel projects, roads, and bridges, as a result, it caused millions in economic and infrastructural losses. Furthermore, it not only affects infra-structural developments and also displaces millions of people.

In addition to this, the agriculture sector of Pakistan is jeopardised due to climate related hazards such as scorching heats, water scarcity, crop related diseases among others. According to FAO, Organisation, drastic decline in the yield of wheat, cotton and rice due to water scarcity and climate induced crop diseases. Furthermore, agriculture sector of Pakistan is considered the backbone of Pakistan's fragile economy if it contributes 24% to the GDP and employs 87.5% work force, according to the Bureau of Statistics of Pakistan. Hence, the government needs to ~~retain~~ introduce resilient farming mechanism to enhance agricultural potential considering climate change impacts on the agriculture sector of the country.

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DAY: _____

Moreover, fog, smoke and dust have severe impacts on the lives of people. It indulges people into health related issues such as Cardiovascular diseases, and skin problem. For example, the toxic air pollution of 2024 in the months of December, January and February in Pakistan have closed all economic and co-curricular activities of people for one months. Further more, according to the National University of Chicago's Energy Policy Institutes estimates that air pollution in Pakistan has reduced the average life expectancy about 4 years. This shows the grim reality of climate change and Pakistan's vulnerability in the face of climate change.

There are several strategic solutions to overcome climate change drastic impacts on Pakistan's long-term survival and sustainability.

First, Transition to renewable energy, one of the important and cost effective strategy to overcome climate change severity. It means, Carbon free environment, where renewable energy dominat each and every sectors of the economy rather than fossil fuels and hydrocarbon. China are of the role model countries for Pakistan. According to International Energy Agency (IEA), China's shares in global renewable energy is more than 80% percent. This shows China's success towards renewable energy in the face of

DATE: _____

DAY: _____

Furthermore, rapid melting of glaciers is also clear examples of climate change. Pakistan, is home to more than 7000 glaciers and lost 23% of ice mass from 1990 to 2018, according to Dawn article. Glaciers are considered the main source of clean water, however, rapid melting of the third pole-Himalian glaciers, Hindukush and Karakoram have jeopardised Pakistan's future water availability. Furthermore, glaciers also play an important role by cooling or absorbing heat on the surface of land. So why ~~these~~ these are called the primary Carbon Sink on Earth.

Biodiversity is the primary ingredients of ecological balance. It comprises forest, soil, micro-organisms and oceans. However, soaring heat, inordinate melting of glaciers and extinction of wild animals are the clear evidences of biodiversity loss. Furthermore, according to the International Union for Conservation of Nature (IUCN), more than hundred types of species have completely extinct from the Earth, among several of them are: Indus River Dolphin, Mountain Gorilla and Amur Leopard. This presents, the harshness of climate change in the face of biodiversity destruction. Therefore, afforestation and reforestation are the necessary steps to avoid more biodiversity loss.

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Furthermore, displacement of population is a clear manifestation of climate change. Every year, billions of people are displaced due to climate change and other related issues. For example, according to (UNEP) estimation, more than 700,000 people were displaced in 2022 in Pakistan due to continuous floods and soaring heat. Furthermore, it not only displaced human population but also toppled the entire population into a state of worsening socio-economic problems such as poverty, illiteracy, and health destruction. According to World Health Organisation (WHO) report, more than 60% of disease spreads due to climate change. Hence, Pakistan needs to introduce robust social mobility mechanism that avoid climate induce risks.

Additionally, climate change not only disturbs the ecological balance of the planet, but it also indulges the population into a worsening socio-economic problems. For instance, according to the World Bank, more than 40% of population lives below poverty line. Lack of food, water, shelter and primary health facility have further exacerbated poverty rate among the poor masses. Furthermore, it not only affects the socio-economic potential of the country but also disrupts the labour force of the country.

DATE: _____

DAY: _____

global climate resilient competition. However, Pakistan's ambitious 13th five year economic revitalization program, Vision Pakistan, also pledges 30% transition to renewable energy. Furthermore, CPEC's initiative energy projects such as Quid-e-Azam Solar Park, Jampur wind projects and Suli linear hydro power projects are also good initiative to acquire renewable energy. Hence, these projects must be prioritized rather than fossil fuels and hydrocarbon.

Second, Sustainable Development Goals are the primary driving force to boost Pakistan's economic and climate related ~~initiatives~~ ^{provisions}. It provides smooth way to environment protection and economic ways to maintain its existence. However, Pakistan's needs to implement all these provisions to sustain its long-term existence. Furthermore, crossborder data sharing and climate related planning must be prioritized to overcome climate induce threats such as erratic rainfalls, wildfires, and inordinate melting of glaciers. Hence, SDGs are very important economic, environmental and political initiatives that must be considered to reduce climate destruction.

Third, resilient Infrastructure development is a guarantor of environment protection and sustainable climate initiatives to avoid themselves from.

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distribution. For example, China's Sponge Cities infrastructure are the clear examples of resilient infrastructure development. Furthermore, strong water water storage mechanism such as dams, barrage and canals system are very important strategy to overcome climate change induces floods and ~~rain~~ heavy rainfalls. Hence, the construction of, Kalabagh Dam, and Diamer Besh dam must be prioritized rather than politicizing of these projects. Fourth, the agriculture sector of Pakistan has consumed 90% of water resources. For example, wheat, cotton and Rice need huge amount of water, as compare to other products. Pakistan needs to cultivate water resistant crops such as fruits and beans to conserve its water resource. Hence, Furthermore, Drip Irrigation system also an important strategy to save water and sustainable farming. Hence, Pakistan needs to introduce sustainable farming technique to conserve its precious water resource.

First last but not the least, robust early warning system is very important strategy in order to minimize climate related hazards. Such as floods, glacial lake Outburst (GLOF) and rapid melting glaciers. Pakistan needs to strengthen its National Disaster Management (NDM), and District Disaster Management Authority (DDMA) to avoid themselves

DATE: _____

DAY: _____

before the occurrence of disasters. Furthermore, Satelites Glacier Surveillance System is also an important strategy to overcome climate related hazards such as melting of ice caps and glaciers.

In a nut shell, Climate Change poses serious threats to Pakistan's long-term survival and sustainability. Repeated climate related hazards such as Glacial Lake Outburst (GLOF), Scorching heatwaves and Inordinate melting of glaciers have severed impacts on Pakistan's economic development and social growth. According to the United Nations Environment Programme (UNEP), the floods of 2010, and 22 caused \$58 billion losses for Pakistan, and displaced millions of people across the country.

Furthermore, despite being less share in global carbon emission, Pakistan ranks among the top ten climate vulnerable countries of the world. In conclusion, there are several solutions to avoid itself from the hazardous impacts of climate change. Few of them were given the above, Pakistan must implement these solutions to offset climate impacts on Pakistan's long-term development and sustainability.