CLIMATE CHANGE

Recharge Pakistan Project Launched with US$ 77 mn funding

First ever Carbon Market Policy Launched at COP29

Climate Budget Tagging: 5000 + Federal Cost Centers Tagged

First Green Sukuk Issued: **30** (Rs. billion)

Around US$ 1.4 billion under the IMF RSF secured

Climate Budget Adopted as Governance System

2024: 9th Warmest Year in 64 Years

with 23.52°C average temperature & 31% above average rainfall

Chapter 17

CLIMATE CHANGE

Climate change refers to long-term shifts in temperatures and weather patterns. While these changes can occur naturally, human activities, particularly the release of greenhouse gases (GHGs), have become the primary driver of global warming. Greenhouse gas emissions, including carbon dioxide (CO_2), keep heat within the atmospheric layer, thereby producing growing global temperature trends. Industrial activities, together with excessive consumerism and fuel-powered transportation, generate most of these atmospheric emissions, particularly through the combustion of coal, oil, and natural gas. These human-driven emissions are accelerating global warming, resulting in the interruption of the Earth's natural climate system.

As a result, global warming has become one of the most pressing global risks, with forecasts suggesting dire economic and humanitarian impacts. The World Economic Forum[1] listed extreme weather events as the second ranked global risks by severity in immediate and short-term outlook (over a 2-year). While, it predicted that the events will become the top leading risk within the next decade. With global warming continuing to rise, the planet is heading towards the +1.5°C temperature mark earlier than expected[2], making irreversible climate effects more apparent and disproportionately impacting the most vulnerable populations. These effects range from weather extremes to slow-onset permanent risks, thereby fundamentally altering societal changes. For instance, the planet experienced its hottest day in history on 22nd July 2024, and 2024 was the hottest year in history, marking the first year with an average temperature above 1.5°C.

While climate change poses an existential threat to all nations, its impacts are unevenly distributed. Although Pakistan generates less than 1 percent of global GHG emissions, it stands in the first rank among the top ten countries affected by climate change based on the Climate Risk Index[2] (CRI) 2022.The report conducted a 30-year assessment (1993-2022), which positions Pakistan among countries frequently encountering extreme weather events. In the 'continuous threats' category, Pakistan is experiencing increasingly frequent and severe extreme weather events that are becoming the new normal. Climate change is not only increasing the frequency of these events but also intensifying their impacts and prolonging their duration. Pakistan's geographical location further exacerbates its vulnerability to these climate-induced threats. The country is surrounded by three mountain ranges with glaciers, along with ice caps, in addition to continuous exposure to warm Arabian Sea temperatures. This makes the country highly susceptible to extreme weather events, including floods, droughts, and Glacial Lake Outburst Floods (GLOFs).

Pakistan stands as a stark example of escalating climate risks. In 2022, the country suffered the world's costliest flood in history, exacerbated by record-breaking monsoon rainfall and GLOFs from June–September 2022, affecting more than 33 million people and resulting in more than 1,700 fatalities, with almost US$ 15 billion[2] worth of damage. The floods, presumably caused by climate change and amplified by extreme monsoon rainfall by 243 percent[3] (during August 2022: the heaviest rain month since 1961), followed a lethal heatwave (from March-May 2022) with temperatures reaching 49.5°C[4], further stressed the environment before the floods began. Thus, the country faces a deepening climate emergency, driven not only

1 Global Risks Report 2025, World Economic Forum (https://reports.weforum.org/docs/WEF_Global_Risks_Report_2025.pdf)

2 Climate Risk Index 2025, Germanwatch (https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf)

3 Pakistan's Monthly Climate Summary August 2022, Pakistan Meteorological Department, GoP (https://cdpc.pmd.gov.pk/Pakistan_Monthly_Climate_Summary_August_2022.pdf)

4 Climate Risk Index 2025, Germanwatch (https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf)

by natural disasters but also by shifting rainfall patterns and rising temperature levels.

Thus, Pakistan is bearing catastrophic climate impacts although most of the greenhouse gas emissions are from large industrialized countries. Climate change is no longer a myth but an urgent reality. The high vulnerability of Pakistan calls for reducing global emissions and creating improved adaptive response strategies locally. The United Nations Sustainable Development Goal (SDG) 13 appeals for urgent action on climate change, which hinges on funding as well as nationally determined contributions, since both of these play a key role in mitigating the risks of disasters. Pakistan is playing its part to respond to climate change through projects such as the National Adaptation Plan and the Recharge Pakistan Project.

17.1 Historical Events of Natural Disasters in Pakistan

Natural disasters have presented serious threats to Pakistan's human capital leading to high future capital investments by the government in infrastructure. Between 1980-2024, Pakistan experienced 224 extreme natural disaster events. Among these disasters, floods have become the most catastrophic threat in terms of economic damage and have impacted a vast population. With 109 occurrences across various subtypes of (flash, riverine, and general) floods, have affected more than 100 million individuals and inflicted a total damage of US$ 36.4 billion (Table 1), economic losses set aside. This disproportionately high impact underscores climate injustice. Additionally, extreme temperatures, particularly heatwaves, are emerging as an ever-deadlier threat, accounting for 2,741 fatalities in 13 events. Tropical cyclones, although just five in number, inflicted more than US$ 1.7 billion in damages. Droughts, with two reported occurrences, have still affected more than 6.9 million individuals severely and resulted in US$ 247 million of damages, highlighting the severity of the disaster and its consequences on Pakistan's agrarian economy.

Table 17. 1: Natural Disasters and their Consequences in Terms of Human Life and Damages (1980-2024)

Disaster Type	Disaster Sub Type	Event Count	Total Deaths	Total Affected	Total Damages ('000 US$)
Drought	Drought	2	220	6,880,912	247,000
Earthquake	Ground Movement	30	75,124	7,420,276	5,345,500
Epidemic	Bacterial Disease	2	105	10,028	
	Parasitic Disease	1	0	5,000	
	Viral Disease	4	130	59,066	
	Infectious Disease (General)	5	131	371	
Extreme Temperature	Cold Wave	3	18		
	Heat Wave	**13**	**2,741**	**80,574**	**18,000**
Flood	Flash Flood	**28**	**3,630**	**22,114,353**	**10,184,118**
	Riverine Flood	**42**	**6,329**	**34,967,357**	**9,727,030**
	Flood (General)	**39**	**5,059**	**43,694,593**	**16,510,230**
Mass Movement	Avalanche	13	580	4,460	
	Landslide	9	222	29,707	18,000
	Mudslide	2	16	12	
	Rockfall	1	13		
Storm	Convective Storm	18	514	1,019,806	
	Tropical Cyclone	5	1,106	2,189,940	1,710,936
	Storm (General)	7	223	3,123	

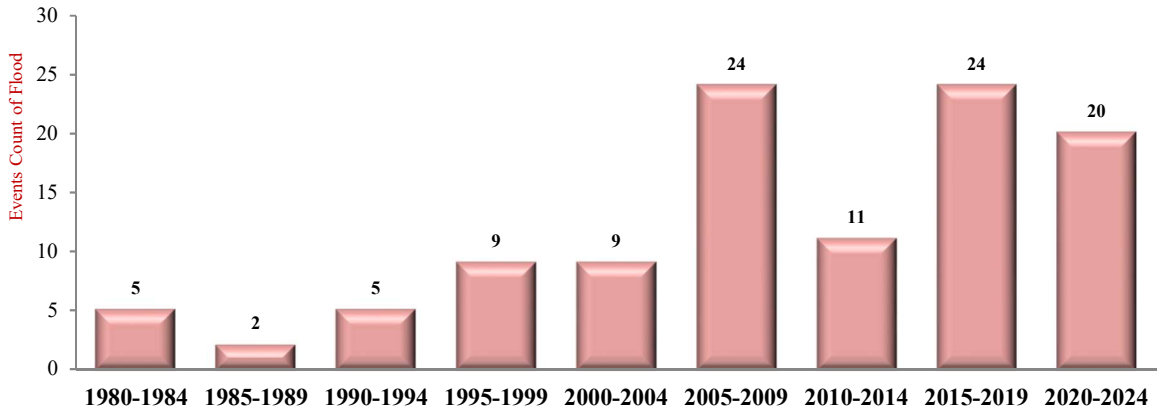
Source: Fiscal Risk Statement March 2025 [5]

Given the scale of floods as the most significant natural hazard in Pakistan, both economically and in terms of people displaced, the temporal dynamics of several flood events based on flood (disaster) sub-type are presented in Figure 1. The figure shows a distinct upward trend in the occurrence of number of flood events, especially since the mid-2000s. Whereas the 1980s and

5 Fiscal Risk Statement March 2025, Finance Division, GoP (https://www.finance.gov.pk/publications/Fiscal_Risk_Statement_March_2025.pdf)

early 1990s marked comparatively low flood events, with intervals such as 1980-84 (5 events). In 1985-89, 2 events and in 1990-94, again 5 flood events occurred. However, in 1995-99 and 2000-04, 9 flood events occurred each, indicating early signs of intensifying climate variability in the country. A drastic rise in number of flood events is noted after 2004.

Fig-1: Number of Flood Events in Pakistan (1980-2024)



Source: EM-DAT, The International Disaster Database

A significant peak is observed in 2005-2009, which recorded 24 flood events, marking the highest number of floods of different sub-types that occurred in the country. Although 2010-2014 saw a decline to 11 events yet the most catastrophic flooding in Pakistan's history occurred in 2010, when the country experienced extraordinary rainfall resulted in unprecedented floods affecting the entire length of the country. The rains/floods of 2010 affected over 20 million people and direct damage and indirect losses, estimated at approximately Rs 855 billion[6]. Subsequently, the frequency of flood events increased once again in 2015-2019, reaching 24 events. The recent phase (2020-2024) also experienced a high number with 20 different flood events, indicating that floods are becoming more frequent and persistent in recent times. In particular, the 2022 floods have shown Pakistan's high susceptibility to climate change as the disaster has demonstrated vulnerability for the people of the country. One-third of the country went underwater, and 33 million people were affected. Nearly 8 million people were reportedly displaced. The scale of the disaster was unprecedented as damages exceeded that of the 2010 floods. In 2022 floods, the damage is estimated at US$ 14.9 billion, the loss to the GDP at US$ 15.2 billion[6].

17.2 FY 2025 Performance Overview: Institutional Arrangements and Key Developments

Substantial progress has been made in strengthening institutional arrangements at the federal level to advance environmental and climate initiatives in Pakistan during FY 2025. These progresses encompass:

17.2-a Pakistan at the 29th session of the Conference of the Parties (COP29)

Ministry of Climate Change and Environment Coordination (MoCC&EC) successfully organized Pakistan's Pavilion at COP29 (11th-22nd November 2024), providing a dynamic platform for global engagement on climate solutions. The Pavilion hosted high-impact panel discussions, side events and networking sessions, showcasing Pakistan's climate commitments, policies, and collaborative efforts. The details of Pakistan's participation in COP29 are presented in Box-1.

6 Statement of Fiscal Risks FY 2024-2025, Finance Division, GoP (https://finance.gov.pk/publications/Statement%20of%20Fiscal%20Risk%20-%20FY2024-25.pdf)

Box 1: Pakistan at COP29 - Leadership and Commitments in Global Climate Talks

At the 29th UN Climate Change Conference (COP29) in Baku (Nov 2024), Pakistan took on a strategic role representing developing countries. Aligning with the G77 & China and the Like-Minded Developing Countries (LMDC) group, Pakistan consistently emphasized equity and Common but Differentiated Responsibilities (CBDR) in negotiations. Key negotiation tracks included the new climate finance goal, carbon markets, adaptation, just transition, and loss & damage. On the New Collective Quantified Goal (NCQG) - dubbed the Baku Finance Goal - Pakistan and other developing nations pushed for an ambitious target of US$ 1.3 trillion in annual climate finance by 2030 (with roughly half as public grants). They resisted developed countries' lower offers and conditionalities, stressing that climate finance must be new, additional, and responsive to developing country needs. After protracted talks, a compromise was reached at US$ 300 billion per year by 2035 for the Baku Finance Goal. Pakistan accepted this markedly lower figure in the spirit of multilateral consensus, while noting it represents only 23 percent of the estimated needs of developing countries.

In Just Transition discussions, Pakistan argued for a broad approach beyond energy, insisting it may encompass adaptation and Means of Implementation (finance & technology). Aligned with fellow developing countries, Pakistan advocated that just transitions be country-driven and supported by public finance (as mandated by the Paris Agreement's Article 9), rather than overly prescriptive or reliant on private sector loans. As a result, the draft Just Transition Work Programme will be revisited in 2025, with Pakistan continuing to champion an equitable, inclusive approach that respects national circumstances. Under Article 6 (carbon markets), Pakistan's diplomacy was pivotal in bridging a nine-year deadlock. It secured consensus by urging flexible reporting requirements for developing countries and keeping the authorization of carbon credits under national control. The agreed rules ensure transparent carbon trading and could reduce the cost of implementing countries' climate pledges by up to US$ 250 billion annually.

In adaptation negotiations, Pakistan (alongside the African Group and others) pressed for integrating finance into the Global Goal on Adaptation (GGA). This helped yield a COP29 decision to develop clear adaptation progress indicators and launch a "Baku Adaptation Road Map" a framework Pakistan advocated to operationalize adaptation goals with adequate support and without new burdens on developing nations. Finally, on Loss & Damage, Pakistan underscored the urgency of aid for climate catastrophes by citing its US$ 30 billion in losses from the 2022 floods. It joined the G77 in demanding the prompt setup of the new Loss and Damage Fund. COP29 delivered: the fund was fully operationalized with institutional arrangements (World Bank as trustee, host country agreement signed) and will start financing projects in 2025. Initial pledges have exceeded US$ 730 million, marking a milestone toward climate justice for vulnerable countries.

Source: Ministry of Climate Change and Environment Coordination

17.2-b National Climate Change Policy (NCCP) 2021

The National Climate Change Policy (NCCP) was initially formulated in 2012 and revised in 2021. It serves as a key document outlining the country's strategy to combat climate change and enhance climate resilience. The National Climate Change Policy Implementation Committee (NCCPIC) oversees the implementation of NCCP at the national level. The key recent developments made by the committee include: Ninth (9th) meeting of the NCCPIC (held on October 31, 2024), chaired by the Minister for Law and Justice, focused on addressing the issue of emissions mitigation strategies in the transport sector. Consequently, 10th meeting of the NCCPIC (held on 8th January 2025) prioritized improving air quality through reduction in emissions.

17.2-c Pakistan Green Building Code

MoCC&EC, in collaboration with UN-Habitat,

Pakistan Engineering Council, and other relevant stakeholders, has formulated the Pakistan Green Building Code, which provides guidelines and a roadmap for sustainable design and construction of environment-friendly and energy-efficient buildings. The ministry is collaborating with the Ministry of Science & Technology on the finalizing the Green Building Code, prior to its approval by the Cabinet.

17.2-d Pakistan's Urban Resilience Policy Framework

Pakistan's Urban Resilience Policy Framework provides overarching policy guidelines for sustainable and resilient urban development for climate preparedness. The policy framework aims to support sustainable urban development across Pakistan by adopting sustainable mitigation strategies, practical adaptation policies, plans, and projects in the context of local economic, environmental, and social circumstances that align with global development frameworks. Its key objectives include: (a) Provision of national level framework that leads to resilient urban centers across Pakistan, (b) Supports effective and comprehensive mitigation measures, (c) Facilitates incorporation of Adaptation measures in future urban development and (d) Guides local institutions along with preparation of action plan. Consultations on the Draft Framework are under way in coordination with provincial governments. Accordingly, the Summary for the Final Framework will be forwarded to the Cabinet after due endorsement of provincial governments.

17.2-e Green Corridors under CPEC-II

The China-Pakistan Economic Corridor (CPEC) is an ambitious infrastructure development project that provides Pakistan with an unparalleled opportunity to drive economic growth and enhance regional connectivity. However, as the country pursues economic advancement, the imperative to integrate climate resilience, environmental sustainability, and green growth into CPEC's development. This highlighted the need to establish a "Green Corridor" along Phase II of the CPEC, aimed at promoting environmentally friendly approaches in road and rail transportation, forestry, agriculture, water, energy and industrial sectors– aligned with Pakistan's national sustainability and climate change goals. The Ministry of Planning, Development & Special Initiatives notified 05 corridors as part of CPEC 2.0, and MoCC&EC was notified as the lead ministry responsible for preparing a concept paper on the initiative.

The Green Corridor concept is based on achieving a balance between economic development and environmental preservation, aligned with the principles of the 5E framework (Energy, Environment, Economy, Equity, and Efficiency), Pakistan's National Adaptation Plan (NAP), the National Climate Change Policy (NCCP), Updated Nationally Determined Contributions (Updated NDC) and China's green development priorities. Key objectives include: a) Enhancing sustainable transport infrastructure along CPEC to reduce carbon emissions, improve air quality and facilitate green economic growth b) Promoting collaborative forestry initiatives to enhance forest cover, biodiversity conservation, and climate resilience c) Implementing climate-smart agriculture and water management to ensure food security and sustainable water use, with climate adaptation as a core principle d) Promoting green energy and cleaner industrial development in line with national commitments for combating climate change and creating green jobs.

17.2-f National Adaptation Plan Progress

The Government of Pakistan (GoP) is advancing national climate resilience via the implementation of the 'Building Capacity to Advance the National Adaptation Plan (NAP) Process' project, supported by a readiness grant from Green Climate Fund (GCF). To facilitate the implementation of interventions under the project, 10 concept notes were developed in 2024 targeting priority sectors. Additionally, five supplementary concept notes will be developed with the potential support from the National Rural Support Programme (NRSP) for subsequent submission to global funding mechanisms such as the GCF and Global Environment Facility (GEF). These efforts aim to bridge Pakistan's climate finance gap and support preparedness for climate-induced risks, including floods, droughts, and heatwaves. Additionally, the project has focused heavily on capacity building, conducting a two-day training

workshop (June 2024) in Khyber Pakhtunkhwa, equipping government officials with skills to develop GCF-compliant proposals and integrate adaptation into development planning.

Further, to ensure informed decision-making, a comprehensive costing exercise was initiated in collaboration with the International Institute for Sustainable Development (IISD). A national workshop held in December 2024 concluded with the development of a costing tool and final report outlining two financial scenarios: US$ 3.9-7.3 billion and US$ 13.7-17.8 billion, required to implement the complete set of 117 adaptation measures identified. The project also completed critical knowledge outputs, including studies on climate impact storylines and the status of climate projections in Pakistan. In addition, at the provincial level, gap analyses were conducted for Khyber Pakhtunkhwa and Sindh (July-December 2024), profiling and categorizing existing adaptation initiatives.

17.2-g Climate Mainstreaming in Public Finance Management (PFM) Tools

The federal government is cognizant of the macro-fiscal implications of climate change and is looking forward to bringing economic diversification to strengthen fiscal resilience by focusing on a greener economy through introducing climate resilience infrastructure and new industries. Therefore, the federal government has adopted a climate budget as a governance system to mainstream climate considerations into policy decision making. The green budgeting enables the government to prioritize climate by integrating it into the budgeting process and fixing responsibility for implementation, monitoring, evaluation and reporting across the line ministries and departments. The details of efforts made to mainstream climate in PFM tools are presented in Box-2.

Box 2: Climate Mainstreaming in PFM Tools

Ministry of Finance (MoF) has developed a framework and action plan to integrate climate, gender and SDGs to into Pakistan's PFM tools. Under this framework, the entire budget process has been made inclusive of climate, gender and disaster considerations. As a result, all budget tools–including Budget Strategy Paper, Budget Call Circular (BCC), Demand Review Committee meetings (budget negotiations), Annual Budget Statement, Budget in Brief, Demand for Grants & Appropriations and Performance Budget Book (known as Green Book)–now contain disintegrated data on gender, climate and disaster for the first time.

The Climate Budget Tagging (CBT) tool has been used to tag climate-sensitive budgetary and expenditure data based on the National Climate Change Policy. Through a consultative process involving all stakeholders, more than 5000 cost centers of the Federal Government under three major classifications (adaptation, mitigation, and other supporting areas) and forty minor sub-classifications have been tagged successfully in the SAP system for accounting and reporting purposes. This enables the ministry to monitor and track of climate related spending and reports can be made available quarterly, mid-yearly and annually. In the medium term, the government plans to ensure that climate sensitive budget does not falls below 8 percent of the ROCG and 16 percent of the PSDP over the medium term. The Climate budget tagging exercise has been extended to tag and map the subsidies in federal budget to identify the climate component. MoF has also designed the methodology and framework to capture the green component in revenues.

All of the above interventions are enabling the Federal Government to make targeted allocations to respond to climate change risks in the future. An added advantage of the framework is its ability to link crosscutting themes in supporting the inclusion of gender and poverty in climate expenditure analysis. A budget that integrates climate risks and is responsive in terms of climate adaptation and mitigation will provide the enabling environment to align international and private financial flows.

Source: Ministry of Finance

17.2-h Pakistan's First Biennial Transparency Report (BTR-1) under the Enhanced Transparency Framework (ETF) of the Paris Agreement

Pakistan's First Biennial Transparency Report (BTR-1) was prepared under the Enhanced Transparency Framework (ETF) of the Paris Agreement. It was supported by the United Nations Environment Programme (UNEP) and financially assisted by the Global Environment Facility (GEF). The primary aim of BTR-1 is to fulfil Pakistan's international reporting obligations and strengthen domestic climate governance. It outlines the country's progress in implementing its Nationally Determined Contribution (NDC). The report highlights mitigation actions across key sectors, including renewable energy deployment, electric vehicle adoption, energy efficiency improvements, and large-scale afforestation initiatives.

17.2-i Pakistan's Third National Communication (TNC) to the UNFCCC

Pakistan's Third National Communication (TNC) to the UNFCCC has been prepared with implementation support from the UNEP and financial assistance from the GEF. The TNC presents Pakistan's national GHG inventory for 2020-21. It outlines the country's progress in mitigation, adaptation, and institutional preparedness. In 2021, total GHG emissions were recorded at 521.46 $MtCO_2e$. The agriculture, forestry and land use (AFOLU) and energy sectors were identified as the main contributors. The report proposes sector-specific mitigation scenarios aimed at stabilizing emissions. It highlights increasing climate risks such as heatwaves, droughts, floods, and glacial melt. Adaptation priorities are focused on agriculture, water, energy, and coastal zones. National frameworks, including the National Climate Change Policy, the National Adaptation Plan, and the Pakistan Climate Change Act support these priorities. The TNC also identifies institutional gaps in measurement, reporting and verification (MRV), inter-agency coordination, and technical capacity.

17.2-j Pakistan Glacier Protection and Resilience Strategy Framework

The Pakistan Glacier Protection and Resilience Strategy Framework is being prepared and aims to conserve and protect the glaciers of Pakistan. By engaging multiple relevant stakeholders, this strategy is multidimensional and objectifies a strategic solution and steps for glaciers' preservation and protection.

17.2-k Recharge Pakistan Project

The launch of the US$ 77 million Recharge Pakistan Project in September 2024 aims to implement ecosystem-based flood management, strengthen flood resilience and promote sustainable water resource management. This initiative will create project implementation jobs, enhance investment in water resilience projects for long-term environmental sustainability, and support eco-tourism, sustainable business activities, licensing, and the Nature Conservation Fund.

In addition to the above-stated institutional arrangement and developments, several important strategic partnerships are also made in FY 2025. These include:

17.2-l Signing of Agreement between the Governments of the Shanghai Cooperation Organization Member States on Cooperation in the field of Environmental Protection

The agreement between the Governments of the Shanghai Cooperation Organization (SCO) member states on cooperation in the field of environmental protection was signed during the meeting of the Council of Heads of States (CHS) on July 04, 2024, in Astana. The key aim of the SCO agreement on environmental protection is to promote collective efforts to address shared environmental challenges, enhance ecosystem protection, and advance sustainable development. Its main objectives include: (a) Strengthening environmental governance and frameworks, (b) Facilitating knowledge sharing and capacity building, (c) Initiating joint projects on climate change, pollution, and biodiversity, (d) Aligning with global frameworks like the Paris Agreement and (e) Enhancing regional cooperation on transboundary issues.

17.2-m Signing of Memorandum with the Ministry of Natural Resources & Environmental Protection of the Republic of Belarus in the field of Environmental Protection

MoCC&EC has signed the Memorandum on Cooperation in the field of environmental protection with the Ministry of Natural Resources & Environmental Protection of the Republic of Belarus. The main objective of this MoU is to create favourable conditions for long-term cooperation in the field of environmental protection for the mutual benefit of the two countries in accordance with this Memorandum. This initiative aims to reduce the negative anthropogenic impact on the environment, ensuring favorable living conditions and improving the natural environment by promoting principles of the green, circular, and low-carbon economy. It focuses on mitigating and adapting to climate change across various economic sectors while protecting air quality, fauna, and flora (particularly endangered species), as well as managing protected areas like nature reserves and national parks. Additionally, it encourages ecological tourism, industrial waste management, urban greening, and education on environmental protection and sustainable resource use, alongside any other areas of cooperation deemed relevant.

17.2-n Country Programme Framework 2024-28 (Global Green Growth Institute (GGGI))

The Global Green Growth Institute (GGGI) is a treaty-based organization promoting green growth by balancing economic development with environmental sustainability. It supports poverty reduction, job creation, social inclusion, and environmental sustainability, focusing on energy, water, land use, and green cities. Pakistan has been a member since 2021 and has become the 41st Member of GGGI. In parallel discussions to CPF, GGGI has been overseeing the implementation of two projects in Pakistan:

- **Supporting Preparedness for Article 6 Cooperation (SPAR6C) Programme (2022-2027):** An EUR 20 million multi-country project funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK). The Programme is managed by GGGI and implemented in Pakistan by the UNEP
- **NDC Technology Roadmap for the Water and Waste Sectors (2023-2024)**: A US$ 248,975 project funded by UNEP through the Climate Technology Centre and Network (CTCN) the technology mechanisms of the United Nations Framework Convention on Climate Change (UNFCCC). To support improved outcomes through this project, GGGI has leveraged a further US$ 158,006 through the Korea Green New Deal Fund (KGNDF), demonstrating an avenue through which GGGI can support Pakistan in accessing expanded sources of climate finance. The GGGI Pakistan CPF for the period 2024-2028 was prepared with the following objectives:
  i. Ensure strategic alignment between country-level interventions and GGGI, GOPs and PSs.
  ii. Deliver transformational and impactful projects with measurable strategic attributes and contributed outcomes.
  iii. Focus on national and sub-national development priorities and ensure government ownership, commitment, and support to the GGGI interventions in Pakistan.
  iv. Develop strong partnerships and facilitate resource mobilization to accelerate green growth adoption.
  v. Promote internal integration and knowledge sharing by bringing together a cross-selection of GGGI experts to deliver a "One GGGI" country approach.
  vi. Strengthen linkages with key global development agendas and GGGI Strategy 2030.

17.3 Pakistan Climate Finance Landscape and its Performance Insights FY 2025

Achieving the sustainable development agenda and net zero emissions requires a major transformation in energy, transport, housing, and communications infrastructures. Investments

required to achieve targets by 2050 are estimated at US$ 100-120 trillion. Developing countries like Pakistan face massive financing gaps owing to inadequate financing mechanisms, underdeveloped domestic markets, limited access to international markets, and concessional finance, which hinder progress on climate and SDGs.

Climate Insurance is an emerging discipline in climate financing and is evolving as an instrument globally. Three are various facets of climate insurance i.e., insurance premiums, risk transfer, repayments, and risk transfer. In this regard, the GoP is working on disaster risk insurance programmes in partnership with Multilateral Development Banks (MDBs). These programmes will create risk layering, transfer the risk to international reinsurers, and reduce the GoP's risk. The key achievements made in FY 2025 under the climate finance comprise:

- GoP has secured around US$ 1.4 billion under the Resilience and Sustainability Facility (IMF RSF). The RSF will support the government's efforts to improve resilience and address climate change challenges. The RSF will focus on: (i) aligning energy sector reforms with our national climate change commitments (ii) promoting green mobility and transport decarbonization (iii) mainstreaming climate issues into budget investment and planning (iv) improving water system resilience and disaster response financing and (v) enhancing the enabling environment for green investments by strengthening Pakistan's climate information architecture.
- GoP is working with ADB on the Insurance Sector Development Programme, which will support sequencing of reforms to strengthen the insurance legal, regulatory, and supervisory framework and capacity, enhance institutional capacity with adoption of robust data repositories, analytics, and digitization of processes. This will support risk assessments, product development and innovation, and foster financial inclusion through product awareness and implementation of compulsory insurance schemes at affordable pricing with capitalization of risk pools for covering high-impact exogenous risks exacerbated by climate change.
- GoP is also discussing the creation of a Solidarity Fund with ADB under CRDEP-2 as an ex-ante funding mechanism and counter-cyclical reserve to reduce reliance on ad-hoc financial support using risk-sharing and risk transfer instruments, such as insurance, reinsurance, and CAT bonds. The Solidarity Fund will be scaled up over time to cover livelihood recovery and reconstruction of critical infrastructure operations following low-frequency, high-impact disaster events.
- Similarly, the World Bank and the GoP are working on the RAM Project, which includes a Climate Risk Fund and a Guarantee Facility. This programme will support the microfinance sector in the country and build its resilience against climate disasters through parametric insurance and guarantees.

Pakistan has various operational climate and disaster-related funds such as NDMF, NDRMF, and a contingent fund. Going forward, all these funds will be consolidated under the Solidarity Fund. In addition, MoF has joined different forums such as the Coalition of Finance Ministers for Climate Action and the Climate Vulnerable Forum, Vulnerable Group of 20 of Finance Ministers (CVF-V20). Pakistan is actively engaged with CVF-V20 as well as the Global Shield and Global Risk Modeling Alliance (GRMA). The progress made in this regard includes:

i. Pakistan has requested GRMA's support to understand the risk of drought, heat, landslides, floods, and earthquakes on agriculture, construction, disaster relief, fiscal budget, education, healthcare, and public infrastructure.
ii. To integrate national climate policies and formulation of bankable projects, Pakistan is engaged with CVF-V20 to prepare the Climate Prosperity Plan (CPP). The CPP aims to maximize socio-economic outcomes and well-being for the country. The

government has kicked off work on the formulation of the CPP.

In addition to the above efforts, the GoP has undertaken several other key initiatives to strengthen climate resilience, which include:

17.3-a National Climate Finance Strategy (NCFS)

The soft launch of the said strategy happened over the COP29, 2024. The NCFS is a time-bound, robust, and living document that will be periodically reviewed and updated. It will be revised every two years based on progress review and feedback from monitoring and evaluation (M&E) reports from the line ministries and the provinces. The initial review is scheduled for FY 2027. The key objectives include identifying key market and policy barriers to scale up finance for priority climate and development objectives, and developing potential financing and other interventions to scale up climate finance, both domestic and private, and international action. NCFS pursues a three-pronged approach centered on three main strategic objectives:

i. Adopt a whole-of-government strategy to create synergy and cohesion across all tiers of governance at both national and subnational levels, thereby accelerating the mainstreaming of climate change in all sectors and tiers of governance.
ii. Mobilize and diversify domestic revenue and investments to leverage them to attract international climate finance, thereby increasing fiscal space for climate action and supporting climate-resilient, low-carbon development.
iii. Diversify finance sources through innovative mechanisms to facilitate partnerships with the private sector and access both domestic and international climate finance and investments.

17.3-b Pakistan's Carbon Market Policy

Pakistan's first-ever carbon market policy was also launched during COP29. Through this policy, Pakistan aims to accelerate clean technology deployment and attract investment in sectors and projects with significant emissions reduction potential, including energy, agriculture, waste management, and forestry. The guidelines will ensure that carbon markets drive real, verifiable reductions while generating substantial economic and social co-benefits across Pakistan. By launching this policy, Pakistan signals its readiness to engage in global carbon markets, inviting both domestic and international partners to join us in advancing a resilient, low-carbon economy with strong accountability and impact at its core. The Policy will enable Pakistan to advance its NDCs and channel carbon finance into projects that yield substantial social, economic, and environmental co-benefits. Pakistan's Carbon Market Policy is built on three core pillars:

i. **Environmental Integrity and Compliance:** Pakistan Carbon Market Policy Guidelines prioritize robust environmental standards, aligning with Pakistan's climate commitments and international obligations under the Paris Agreement. The country is committed to ensuring that every mitigation project authorized within our borders complies with the highest standards of environmental integrity and transparency.
ii. **Economic Development and Investment Mobilization:** Pakistan's carbon markets are designed to attract substantial investment, both domestic and international, into low-emission development projects. Facilitating carbon credit issuance and trading is helping create market incentives that attract greater investment in emission reduction projects.
iii. **Equitable Benefit Sharing and Social Safeguards:** At the heart of Pakistan's Carbon Market Policy Guidelines is an unwavering commitment to social inclusion, equity, and benefit sharing. Our approach recognizes that the journey toward a sustainable, low-emission future must be both inclusive and just.

17.3-c Green Climate Fund (GCF)

GCF accelerates transformative climate action in developing countries through a country-owned partnership approach and the use of flexible financing solutions. The preceding year, the

MoCC&EC was able to secure funding for the following four projects, amounting to GCF financing of approximately US$ 82 million: The projects include:

i. **Integrated Climate Risk Management for Strengthened Resilience to Climate Change in Buner and Shangla Districts of Khyber Pakhtunkhwa Province, Pakistan (WFP):** The project will enhance flood early warning and anticipatory action by strengthening the value chain and dissemination of climate information services and early-warning systems, benefitting 1.6 million people.

ii. **Resilient Water Infrastructure Facility (RWI) (IFC):** The project will focus more on the Public Private Partnership (PPP) structure facility and the Blended Finance facility in the water resources sector.

iii. **Harnessing the Domestic Private Sector Ecosystem for Climate Action in Pakistan (NRSP):** The initiative aims to create a climate action venture studio environment, offering space for climate discourse, a consortium of stakeholders, pre-seed grant financing, later stage debt financing, mentorship for women, PWDs and transgender entrepreneurs, and gender-responsive technical assistance.

iv. **Acumen Climate Action Pakistan Fund (Acumen Fund):** The goal of this project is to improve the climate resilience of vulnerable farmers and their livelihoods by providing access to climate adaptation solutions for smallholder farmers, benefitting 13.1 million individuals.

17.3-d Launch of First Green Sukuk

The transition towards sustainable finance is an important priority of the GoP. In this regard, the government has launched its first Green Sukuk in FY 2025 for a greener and cleaner Pakistan. The details of the initiative are given in Box-3.

Box 3: Transition towards Sustainable Finance: Launch of First Green Sukuk

The Green Sukuk is an initiative of MoF and is a landmark transaction intended to raise Shariah Compliant funding for the development of Green, Sustainable and Social projects in the country. This pioneering financial instrument is set to revolutionize Pakistan's Sukuk market by channeling investments into environmentally sustainable projects while fostering economic growth.

The initiative marks a pivotal step in aligning Pakistan's financial markets with global best practices in green financing. The inaugural issuance, amounting to Rs 30 billion, was conducted through an auction process, with the Pakistan Stock Exchange (PSX), which is playing a central role in listing and promoting this innovative instrument to investors.

The Sustainable Investment Sukuk Framework, approved by the Cabinet, lays the foundation for the landmark debut of the Green Sukuk. It reflects the government's strong commitment to leveraging financial markets in support of sustainable development.

The launch is a historic step toward integrating sustainable finance into the core of Pakistan's development strategy. The Green Sukuk market is expected to attract a broader investor base, deepen the financial markets, and accelerate the country's transition to a green and resilient economy.

Source: Ministry of Finance

17.4 Global Climate Snapshot and Pakistan's 2024 Profile

Trends in climate change are understood in the context of the naturally occurring variability in the ways climate key indicators flicker from year to year within their respective typical 'range of variability', often referred to as the business-as-usual scenario.

17.4-a Global Emerging Climate Patterns

The latest State of the Global Climate 2024[7] report by the World Meteorological Organization (WMO) presents an assessment of how accelerating climate change is affecting

7 State of the Global Climate 2024 (https://library.wmo.int/viewer/69455/download?file=WMO-1368-2024_en.pdf&type=pdf&navigator=1)

global sustainability. The report documented that 2024 was the warmest year in the 175-year observational record, as the annually averaged global mean near-surface temperature reached 1.55 °C ± 0.13 °C above the 1850-1900 average. While a single year above 1.5 °C of warming does not imply that the long-term temperature goals of the Paris Agreement are beyond reach, yet it is a clear warning that climate change is intensifying risks to human well-being, economies, and ecosystems as a whole. Throughout 2024, the oceans continued to absorb heat, sea levels continued to rise, and ocean acidification increased. The cryosphere, which is the Earth's frozen regions, has experienced further melting, with glaciers retreating and Antarctic sea ice shrinking to its second-lowest extent ever recorded. Extreme weather events caused widespread damage, further complicating efforts to achieve the SDGs.

The global annual average mole fraction of CO_2 in the atmosphere reached a new observed high in 2023 at 420.0 ± 0.1 parts per million (ppm), marking an increase of 2.3 ppm over 2022 and representing 151 percent of pre-industrial levels (1750). This concentration corresponds to 3,276 Gt of CO_2 in the atmosphere. Between 1st January to 31st December 2023, the CO_2 concentration rose by 2.8 ppm, the fourth-largest within-year increase recorded since the 1950s. El Niño conditions typically accelerate this growth due to increased fire emissions and reduced carbon uptake by terrestrial ecosystems. In 2024, global temperatures were further elevated by a strong El Niño. Every month from June 2023 to December 2024 exceeded previous monthly global temperature records. However, by mid-2024, sea-surface temperature anomalies began to decline, returning to ENSO-neutral conditions around June. All in all, the transition occurred from El Niño to neutral conditions during 2024[8]. These rising temperatures, sea-level rise, and consequently socio-economic disruptions are compounding challenges related to food security (SDG 2), water availability (SDG 6), economic resilience (SDG 8), and biodiversity conservation (SDGs 14 and 15).

17.4-b Pakistan Climate Landscape

The year 2024 witnessed severe climate phenomena in Pakistan, characterized by extreme heat, unpredictable rainfall, and regional disparities, highlighting the increasing effects of climate change in the country. These climatic anomalies included both elevated rainfall and enhanced temperatures. At the national level, Pakistan received 31 percent more rainfall than usual, amounting to 390.0 mm, and the yearly average temperature increased to 23.52°C (0.71°C higher than normal), demonstrating a significantly warmer and wetter year on average. Figure 2 depicts climate events occurred during 2024, reported by the Pakistan Meteorological Department[8].

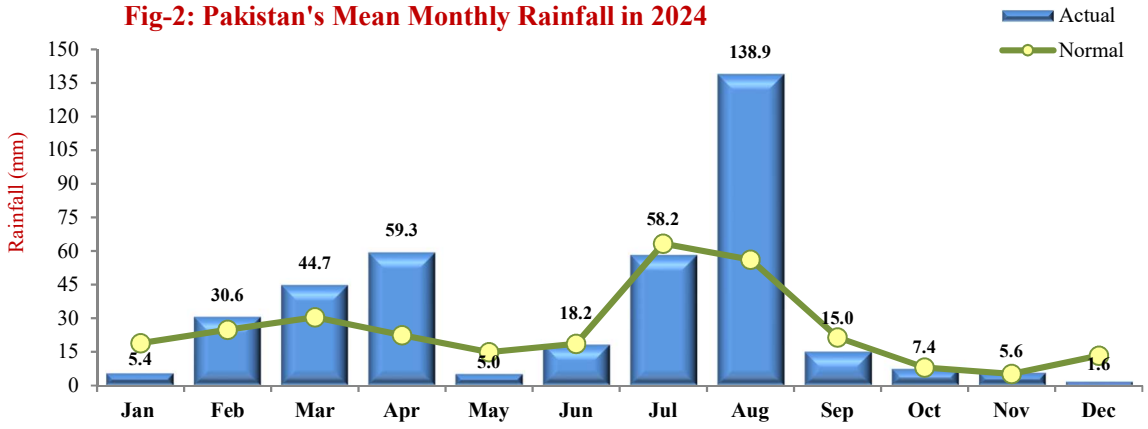
According to Pakistan Meteorological Department[8], Sindh and Balochistan emerged as the most climatically extreme regions. Sindh recorded a staggering 94 percent increase in annual rainfall and witnessed the hottest day of the year at Mohenjo- Daro with 52.5°C on May 26. Jacobabad marked the warmest month, averaging 46.3°C in May. In addition, the province was also affected by Tropical Cyclone ASNA between August 30th to September 2nd. Balochistan experienced 82 percent increase in rainfall, but also held the record for the driest place (Nokkundi, 45 mm annually). Pakistan experienced its warmest night at Sibbi (36°C on May 28-29), along with Turbat being the warmest place with the temperature reaching 36.1°C. Punjab experienced an 18 percent rise in rainfall and recorded the wettest day (337 mm) and wettest month (603 mm) at Lahore in August, underlining heavy monsoon occurrence. Khyber Pakhtunkhwa saw a modest 4 percent increase in rain and recorded the coldest day of the year at Malam Jabba (-2.0°C on February 19). In contrast, northern regions faced reduced precipitation, with Gilgit-Baltistan (GB) receiving 12 percent less rain and Azad Jammu and Kashmir (AJK) 13 percent less. However, Malam Jabba in AJK still emerged as the wettest place in Pakistan with 1789 mm annual rainfall. Gilgit-Baltistan also recorded extreme cold, with Kalam hitting -14°C on the coldest night and -8.6°C as the coldest month's average in February 2024.

8 State of Pakistan Climate in 2024 (https://cdpc.pmd.gov.pk/Pakistan_Climate_2024.pdf)

17.4-b(i) Rainfall: Above-Average Annual Precipitation

According to the State of Pakistan Climate Report[9], in 2024, Pakistan recorded a total national rainfall of 390.0 mm, which was 31 percent above the long-period average of 297.6 mm (1961-2010). This made 2024 the 7th wettest year in the past 64 years, with the all-time record remaining 526.9 mm, set in 2022. The temporal (monthly) distribution of rainfall is illustrated in Figure 2[9]. The year began with a severe rainfall deficit in January, recording only 5.4 mm, which was 72 percent below average (standard: 18.9 mm), with a similar large deficiency observed across multiple regions. However, conditions improved significantly in the following two months. In February 2024, national area-weighted rainfall reached 30.6 mm, marking a 23 percent increase above the average. This upward trend continued in March, with the same area-weighted total of 30.6 mm, but with a 47 percent surplus. April 2024 stood out as the wettest April since 1961, with 59.3 mm of rain, 164 percent above average, surpassing the previous April record of 55.8 mm set in 1983. In contrast, May 2024 saw a sharp decline, receiving only 5.0 mm of rain, 66 percent below average, making it the second driest (following 3.6 mm in 1988) May on record. June 2024 brought 18.2 mm of rain, a near-average amount with a slight positive anomaly of 2 percent. The monsoon began in July, delivering 57.5 mm, which was also near average but slightly below normal by percent The monsoon peaked in August, which saw 138.9 mm of rainfall (a 147 percent increase) making it the second wettest (after the 193.2 mm recorded in 2022) August in the past 64 years. However, September 2024, reversed the trend with a 30 percent decrease in rainfall (receiving only 15.0 mm). October followed with 7.4 mm, which was slightly below average by 8 percent, while November was near normal (with 5.6 mm), showing a positive anomaly of 8 percent. Finally, December 2024 ended the year on a dry note, recording just 1.6 mm of rainfall, which was 88 percent below average, ranking it as the 10th driest December in the last 64 years.

Fig-2: Pakistan's Mean Monthly Rainfall in 2024



Source: Pakistan Meteorological Departtment

17.4-b(ii) Temperature: Another Warm Year

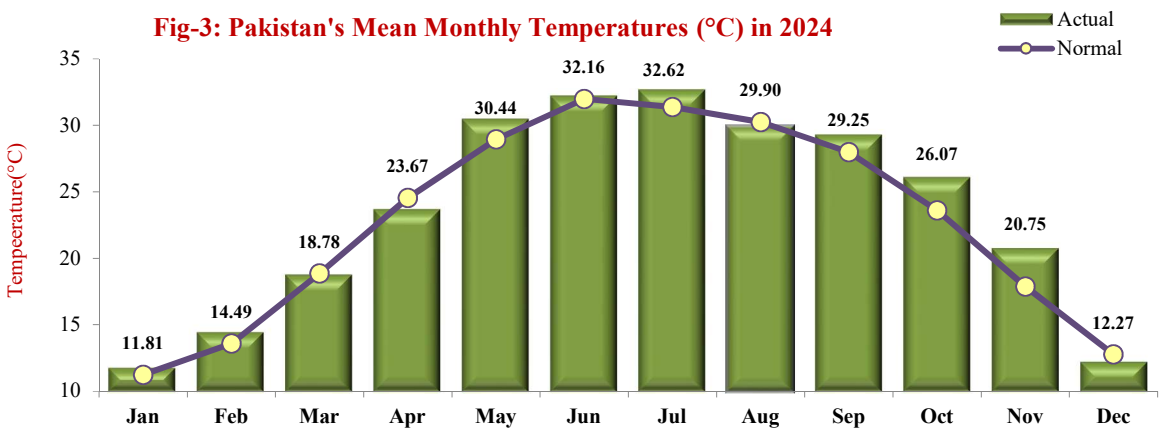
As per the State of Pakistan Climate Report[10], in 2024, Pakistan experienced another notably warm year, with the national annual mean temperature reaching 23.52°C, an increase of 0.71°C above the long-term average of 22.80°C (based on the 1961-1990 baseline). This made 2024 the 9th warmest year on record over the past 64 years, with the highest ever being 23.95°C in 2002. The annual mean maximum temperature at the national level stood at 30.37°C, which was 0.68°C above the average of 29.69°C. All sub-regions, except Punjab (which showed a slight negative anomaly of -0.13°C), experienced warming with anomalies ranging from 0.21°C to 1.40°C. Among the regions, AJK recorded a maximum of 23.84°C (+1.40°C),

9 State of Pakistan Climate in 2024 (https://cdpc.pmd.gov.pk/Pakistan_Climate_2024.pdf)

making it the third highest on record (the highest: 24.1°C in 2001), while GB recorded 22.00°C (+1.25°C), ranking as the seventh highest in the past 64 years (record: 22.96°C in 2001).

On a monthly basis, temperature fluctuations reflected a clear warming trend for most of the year, as demonstrated in Figure 3[10]. January 2024 began with a national mean temperature of 11.81°C, which was 0.58°C above average. February also remained warmer across all sub-regions, with positive anomalies ranging between +0.17°C to +1.17°C. March experienced a slight cooling with a national anomaly of -0.08°C, followed by a relatively cooler April, which recorded negative anomalies between -0.43°C and -1.7°C across most regions, except for GB and Sindh, where temperatures were slightly above average by +0.12°C and +0.40°C, respectively. The month of May recorded warmer temperatures again, with temperatures in all three indices exceeding the normal level, showing anomalies from +0.84°C to +3.42°C. In June, this pattern continued with anomalies ranging from +0.18°C to +0.56°C countrywide. July 2024 marked a particularly extreme month, with record-breaking temperatures across Pakistan and its sub-regions. The national mean temperature reached 32.62°C, which was 1.26°C above the country's average of 31.36°C, making it the second warmest July in 64 years (record: 32.63°C in 1969). August, on the other hand, brought slight relief, with temperatures in Punjab, Balochistan, and Sindh dipping slightly below average, recording anomalies between -0.36°C and -0.74°C. September rebounded with well above-average temperatures, ranking among the top ten warmest in all indices. October 2024 saw another significant spike, recording the warmest national mean temperature for the month at 26.07°C (2.48°C above average), breaking the previous record of 25.46°C set in 2013. November 2024 maintained this record-breaking trend, with significantly warmer-than-average conditions across the country. However, the year closed with a slight reversal in December, as national temperatures dipped just below average, recording a modest negative anomaly of -0.49°C.

Fig-3: Pakistan's Mean Monthly Temperatures (°C) in 2024



Source: Pakistan Meterological Department

Overall, both globally and in Pakistan, a mix of climate-driven challenges was experienced in 2024. These challenges represent intensifying climate variability and extreme weather. Further, these developments highlight the escalating need for enhanced adaptation efforts, resilient infrastructure and proactive measures to combat the increasing impacts of a shifting climate.

17.5 Provincial Achievements and Initiatives

Provincial governments also undertook a range of initiatives and achieved significant milestones aimed at boosting climate resilience, enhancing sustainable development, and strengthening disaster management across the country. The

10 State of Pakistan Climate in 2024 (https://cdpc.pmd.gov.pk/Pakistan_Climate_2024.pdf)

details of these initiatives and achievements are as follows:

Punjab

- The Punjab Cabinet approved the "Climate Resilient Punjab Vision and Action Plan 2024" in August 2024. The plan presents a structured roadmap on three core policy areas: Climate Change Adaptation, Mitigation, and Low Carbon Development, and Integration of Adaptation & Mitigation for addressing interconnected challenges.
- As a proactive step to safeguard public health, the Health Advisory System for Critical Air Pollution Events (HAS-CAPEs) was launched to manage episodes of severe air pollution and its strict progress has been monitored.
- Another major landmark initiative taken in the province is the upgradation of the Air Quality Monitoring System of Punjab. Now the government has installed 30 new AQMS throughout Punjab, and further 30 AQMS are under the procurement process under the "Punjab Smog Mitigation and Response Initiatives Airsafe".
- To strengthen enforcement against plastic pollution, the Government of Punjab imposed a province-wide ban on single-use plastics and polythene bags thinner than 75 microns, resulting in the confiscation of 120 tonnes of banned plastic and fines amounting Rs 28 lakhs have been imposed.
- In addition, an electronic database and management information system, called the Plastic Management Information System (PMIS), has been developed to track plastic production, recycling, and monitoring.
- As a landmark step toward environmental law enforcement, the Environmental Protection Agency launched the first-ever Environmental Protection Force (EPF), comprising 250 trained personnel, including 55 Inspectors and 195 Field Assistants. To ensure targeted action, the force is divided into specialized units: Red Squad (hazardous materials from industry and hospitals), Blue Squad (water conservation), Black Squad (vehicular emissions and fuel testing), and Green Squad (urban vigilance on plastics, fugitive dust, dengue, etc).
- Other key initiatives to strengthen environmental protection and pollution mitigation efforts include regulatory, technology, enforcement, infrastructure, and ecological restoration initiatives.

  i. **Regulatory:** The Government of Punjab has developed missing Environmental Quality Standards (EQS) and revised existing ones, along with constituting the 4th Punjab Environmental Protection Council (PEPC).

  ii. **Technology:** Technological advancements include the use of drones equipped with sensors for real-time monitoring of pollution hotspots and dispersal of smog-reducing agents, the successful demonstration of an indigenous Aerosol Dispersion Kit (ADK) in February 2025, and the operationalization of camera-mounted mobile monitoring units linked to the Smog Control Room. Additionally, e-mapping of industries and inspections via the Eco-Watch App is also made. Camera-Mounted Mobile Monitoring unit has also been launched with live view connected to the Smog Control Room for monitoring units.

  iii. **Enforcement:** The enforcement efforts comprise the conversion of conventional brick kilns to the zig-zag methodology. A total fine of Rs 77.4 million was imposed in 2024 for stubble burning incidents under the Smog Control and Prevention Rules, 2023. Drone surveillance is also being used to monitor stubble burning. Public engagement has been enhanced through the launch of the Green Punjab App and the Smog Helpline (1373), enabling citizens to report environmental violations in real time.

  iv. **Infrastructure:** Green initiatives in infrastructure include mandating the installation of mist sprinkler systems on all commercial construction sites and launching of a pilot Smog Cleaning Tower at Mehmood Booti (Lahore,

Punjab, Pakistan). In addition, ecological restoration is made through Eco revival of Archaeological Sites (Miyawaki at Hiran Minar) and enhancing the carbon hotspot with carbon sinks via the plantation of 400,000 trees.

- Lastly, several development projects focused on climate- related initiatives are currently underway in the province. These include:

  i. CM Punjab Green Credit Programme with a budget of Rs 1000 million aiming to register government projects under Article 6 of the Paris Agreement, designing an Emissions Trading System (ETS) for Punjab, evolving a voluntary green credit mechanism into a tradable system, improving environmental governance and promoting green investment in the province.

  ii. In addition, the EPA Upgradation Project (Rs 397 million) focuses on strengthening the EPA capacity, enforcing Smog Rules 2023, and monitoring pollution hotspots in Lahore and nearby areas. Similarly, Air Safe Initiative Air Safe (Rs 5.3 million) equips Punjab with 30 AQMS. To mitigate smog and dust, the project will also acquire fog cannon machines. Additionally, flue gas analyzers and CO_2 analyzers will be procured for industrial emission monitoring. The project will also establish a Centralized Data Gathering and Dissemination System.

  iii. The Construction of Green Building for EMC, EPD, and Allied New Entities Established project, costing 3312.8 million, marks a significant development. This initiative will deliver the first-ever LEED-certified green building in the public sector.

  iv. Environmental Monitoring of Industrial Units (DLI 1-3, PGDP World Bank) (861.00 million). These projects are aimed at strengthening EPA's 08 laboratories, enabling them to check the compliance of the PEQS of industrial emissions, which are one of the sources of prevalent smog in the Lahore region.

  v. An investigation study on sources of Particulate Matter 2.5 (PM2.5) for informed decision making in Punjab (Rs 400 million) is being conducted in Lahore, Gujranwala, and Sheikhupura. Similarly, the ADP Scheme titled "Piloting the Pollutant Release Inventory of Punjab" (Rs 550 million), Enhanced Air Quality Monitoring System in Punjab (DLI-2, PGDP) (Rs 5205.3 million) for continuous monitoring of air quality in 10 priority districts (Lahore, Sheikhupura, Faisalabad, Rawalpindi, Multan, Gujranwala, Sialkot, Bahawalpur, DG Khan, Sargodha), Establishment of Environmental Monitoring Centre (DLI-2, PGDP) (Rs 821.7 million) and Establishment of 9th Divisional Laboratory of EPA in Sahiwal (150 million) are currently under process/in the pipeline for execution.

Sindh

- The Directorate of Climate Change, Environment Climate Change & Coastal Development Department (ECC&CDD) played a pivotal role in contributing to the formulation of the Pakistan Policy Guidelines for Trading in Carbon Markets 2024, supporting the country's transition towards a low-carbon economy.

- Other key achievements of the ECC&CDD include: the inspection of over 500 industrial units across Sindh the collection of over 200 water samples to assess compliance with Sindh Environmental Quality Standards (SEQS), and the inspection of approximately 400 vehicles for vehicular emissions, which led to fines totaling around two lakh rupees for non-compliance. Additionally, hundreds of industries submitted their Environmental Monitoring Reports, around 25 public complaints were addressed, and various workshops, seminars, plantation drives, and awareness campaigns on the hazards of plastic waste were successfully organized in collaboration with relevant stakeholders.

- The expansion and strengthening of environmental laboratories in EPA buildings at Karachi, Hyderabad, and Sukkur are key projects in the pipeline of the department, along with a planned study on ambient air quality across Sindh.

Khyber Pakhtunkhwa

- The Government of Khyber Pakhtunkhwa, through its Wildlife Department, took significant steps to strengthen biodiversity conservation and support climate change resilience. From July-December 2024, the department generated Rs 54.431 million in revenue, supported by the revision of Small Game Shooting Permit Fees and the issuance of 35 Big Game and 906 Small Game Licenses. An additional 24 Big Game and 805 Small Game Licenses were issued from January to March 2025.
- Similarly, in line with its broader efforts to promote climate resilience and biodiversity conservation, the Government of Khyber Pakhtunkhwa notified Chappar Mishti, Star Sam, and Oblan areas of District Orakzai as Community Game Reserves in 2024, increasing the Protected Areas Network of the province from 16.75 percent to 16.89 percent. Building on these conservation measures, 58 potential areas of waterfowl hunting have been closed throughout the province for the first time in its history. In addition, 45 Community Games, 19 Public Games and 6 Private Game Reserves are closed during the shooting season of partridges for the FY 2025, along with 22 tehsils were also declared closed for hunting.
- The federal government, in collaboration with the provincial government, has launched the 10 Billion Tree Tsunami Programme (10-BTTP) with a target of one billion seedlings across Khyber Pakhtunkhwa. Since its inception until April 24, 2025, the programme has achieved the plantation of 121.5 million plants and the rehabilitation of 8 million plants in degraded watersheds. Additionally, approximately 0.3 million local residents have been employed in various project activities.
- Complementing these efforts, the Merged Areas Integrated Development Forestry Sector Project (AIP), an ongoing initiative (with a cost of Rs 15,591.2 million) notably achieved, the development of 5.12 hectares of departmental tube nurseries and the plantation of 1,888 multipurpose trees on communal private and marginal lands to support climate change mitigation efforts.
- Other development projects in the province include: Forestry Sub-Sector project, which focuses on research-based forest development, agro forestry promotion, and the conduct of ecological studies across Khyber Pakhtunkhwa. Its key achievements from July-March FY 2025 include the completion of raising 100 acres of research plantations and 70 acres of quinoa cultivation as a farm forestry crop.
- Concluding the project initiatives in the province, the NTFP Sub-Sector project achieved significant progress July-March FY 2025 by: establishing one community-based NTFP enterprise, propagation of lemongrass across 0.25 acres, establishment of walnut nurseries in Malakand and Hazara covering 0.5 acres, training of 200 chilghoza cone collectors, traders and processors, empowering 155 individuals through skill development programmes in Medicinal and Aromatic Plants (MAPs) conservation and value chain enhancement.

Balochistan

- The implementation update for the use of Plastic Shopping and Flat Bags Act, 2023 shows ongoing advancements throughout Balochistan. The updated progress on the ongoing anti-plastic campaign reported a total of 87,791 kg of plastic shopping bags have been confiscated from 24 districts.
- As part of the province's efforts to strengthen climate finance, the establishment of a dedicated Climate Change/Climate Finance Cell in Balochistan is currently underway. The cell, once operational, will be responsible for addressing climate change challenges, including mitigation &adaptation strategies, and securing funding opportunities.

- The Balochistan Environmental Protection Agency (BEPA) has procured two (02) Ambient Air Quality Mobile Monitoring Stations, one designated for the District Hub and the other for Quetta to facilitate the collection of critical data required for assessing ambient air quality. Additionally, the BEPA has secured approval for the procurement of Portable Environmental Testing Equipment under the PSDP 2024-25, aimed at strengthening the enforcement of environmental regulations.
- As an update on the installation of Effluent Treatment Plants (ETPs), the BEPA has successfully facilitated the installation of ETPs across 27 industrial units, aiming to mitigate water pollution by ensuring effective treatment of industrial effluents, removing contaminants, and safeguarding local water resources and ecosystems in line with environmental standards.
- In continuation of pollution control efforts in the province, the BEPA has also successfully facilitated the installation of 21 industrial scrubbers across various units. This initiative aims to mitigate emissions and improve air quality compliance by targeting particulate matter and gaseous pollutants at the source, in alignment with environmental standards and regulatory frameworks.
- The update on hospital waste management highlights the significant quantities of hazardous biomedical waste, posing serious risks to public health and the environment. In response, BEPA has implemented rigorous surveillance measures under Section 19 of the Balochistan Environmental Protection Act, 2012.
- To address environmental and public health concerns arising from the location and operation of scrap godowns, the BEPA has undertaken the systematic relocation of 280 scrap godowns from the densely populated Sabzal Road area to a designated site at Qambrani Road, Quetta. This strategic initiative aims to mitigate environmental hazards, reduce health risks, and support sustainable urban planning.
- In addition, as a result of BEPA's rigorous efforts, all 41 limestone crushing plants operating in Quetta city and surrounding areas have been dismantled, now ensuring full compliance with environmental regulations. This follows the previous dismantling/closure of 39 crush plants in and around the Quetta Valley to control dust emissions.
- The update to the ongoing efforts for the conversion of Bull Trench Brick Kilns (BTKs) to Zig-Zag Kiln (ZZK) technology, the BEPA, in compliance with the Environmental Protection Tribunal's (EPT) directives, has issued clear instructions mandating all brick kilns to transition to ZZK technology during the winter period of seasonal inactivity, stating failure to comply will result in a prohibition on resuming operations.
- Lastly, BPEA generated total revenue of Rs 12.3 million through 19 EIAs and 189 IEEs, carried out from July 2024 to March 2025.

Concluding Remarks

The escalating climate crisis poses an existential threat to Pakistan. Extreme weather patterns, rising temperatures, and erratic rainfall are increasing in frequency and intensity as the world crosses the crucial 1.5°C threshold. Pakistan is one of the most susceptible to climate-related disasters, despite making a negligible contribution to global greenhouse gas emissions. In this context, Pakistan continues to experience an alarming increase in climate-related disasters, from extreme heatwaves and monsoon floods to GLOF and air pollution, with 2024 setting yet another record for heat and rainfall anomalies. The economic and social costs are already profound, as evidenced by the devastating 2010 and 2022 floods, which caused billions of dollars in damages and forced massive displacement and high future capital investment. As these challenges intensify, Pakistan's climate profile is increasingly mirroring global trends of heightened variability and distress, making the country's resilience dependent on urgent, coordinated action at multiple levels.

Government initiatives, especially at the federal level, indicate a growing institutional recognition of the climate emergency in response to the increasing climate risks. Initiatives such as the National Adaptation Plan, the Recharge Pakistan Project, and

mainstreaming climate in PFM tools reflect meaningful progress and seriousness of the government's commitment to the climate change phenomenon. Complementing these efforts, provinces are also taking proactive measures, demonstrating a multi-tiered effort to combat climate change. However, given the scope and pace of climate change, even more concerted, well-funded global solidarity and climate justice are required along with efforts at the national level. Climate justice demands that developed and emerging countries take greater responsibility for their anthropogenically introduced climate change and uphold the pledges made at the Paris Agreement and COP29, to prevent climate-vulnerable countries such as Pakistan from being left to suffer the consequences of a crisis they did not cause. Moving forward, vulnerability can be transformed into resilience through consistent investment in renewable energy, climate-smart infrastructure, and ecosystem restoration. By aligning global support with efforts made at the national level, Pakistan can not only mitigate the climate crisis, but also ensure safer and more sustainable future.