FISCAL
RISK
STATEMENT
FY 2024-25

A stand-alone fiscal risk statement on fiscal implications of climate change related events and its macroeconomic impact based on both quantitative and qualitative analysis

ECONOMIC ADVISER'S WING
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Foreword

The Fiscal Risk Statement FY2024-25 provides an overview of potential risks that could impact the country's fiscal outlook in the coming years. The development of the Fiscal Risk Statement is a complex process that requires collaboration and input from various stakeholders, and I am confident that it will be a valuable resource for all those interested in the future outlook of the economy. Pakistan's economy has faced multiple challenges recently, affecting economic growth and fiscal deficit. The Government of Pakistan (GoP) has taken various measures to address these challenges, including the implementation of key economic reforms to contain fiscal deficit, hence increasing investment in key sectors to embark on a path of economic growth.

In an era defined by the far-reaching consequences of climate change, nations worldwide are confronting an array of fiscal risks stemming from environmental volatility and natural disasters. Despite contributing minimally to global greenhouse gas emissions, Pakistan finds itself at the forefront of this global challenge, grappling with the profound impacts of climate change on its economy and society. As we embark on a journey to assess the fiscal implications of climate-related events, this report delves into the intricate interplay between environmental factors and fiscal resilience within Pakistan's context.

As we navigate the complexities of climate-related fiscal risks, it becomes increasingly apparent that collaborative and proactive approaches are indispensable. By fostering partnerships among diverse stakeholders and aligning fiscal policies with environmental imperatives, Pakistan can fortify its resilience against climate shocks and pursue sustainable development pathways. Together, let us forge a path toward a resilient and sustainable future where fiscal prudence and environmental stewardship converge to create a prosperous and resilient Pakistan.

I would like to express my gratitude to the World Bank for supporting this report's preparation. The efforts of the officers of the Economic Advisor's Wing, Finance Division, have been critical in preparing this document. At the same time, the support of the External Finance Wing, Budget Wing, and Debt Management Office of the Finance Division and Ministry of Climate Change must be commended. In Particular, I would like to appreciate the hard work done by Dr. Imtiaz Ahmad, Economic Adviser, and Dr. S. M. Naeem Nawaz, Director (Fiscal), in the preparation of this comprehensive document. I hope that this report will serve as a valuable resource for policymakers, investors, and stakeholders.

(Imdad Ullah Bosal)
Secretary Finance

EXECUTIVE SUMMARY

- This Fiscal Risk Statement analyses the fiscal implications of climate change related events and their macroeconomic impact. In the Green Investment Scenario (S1), the rise in the average degree temperature and its volatility are considered risk exposure. It is assumed that the government will partially contribute to climate change mitigation expenditures, as envisaged in Nationally Determined Contributions 2021. Additionally, economic activity and government revenues are expected to increase due to the improved climate and economic activity.

- Scenario 2 (without Natural Disaster Fund) and 3 (with Natural Disaster Fund) analyses the impact of a one-time natural disaster shock in FY2030, projecting negative macroeconomic effects such as a 2.5 percentage point loss in real GDP growth, 4 percentage points higher inflation, and 15 percent additional exchange rate depreciation compared to the baseline, with the negative effects expected to diminish over three years, while government expenditures are projected to increase by 5.3 percent of GDP over five years from FY2030 to FY2034. Scenario 4 analyses the fiscal risk if the natural disaster fund is available and government revenues are increased due to improved governance and favourable tax policy changes.

- The baseline macroeconomic and fiscal forecasts signify a stable macroeconomic and fiscal outlook without any external shocks. The real GDP growth is projected to remain from 4.8 percent to 5.8 percent in the long term, whereas inflation will stabilize around the long-term average rate of 7 to 8 percent. Any changes in the baseline projections or assumptions in the coming months will not have any significant impact on the risk analysis. Furthermore, provincial governments are envisaged to maintain an overall fiscal surplus during the period of analysis.

- Scenario 1 is more promising given that both the private and public sectors are involved in green investment from FY2025 to FY2030 to meet the climate change mitigation target. Under this scenario, the federal fiscal deficit is estimated to be 3.5 percent of GDP in FY 2034 against 3.6 percent under the baseline scenario. Moreover, by FY2034, the total debt of the government is marginally higher (by 0.9 percentage points of GDP), standing at 51.1 percent of GDP against 50.2 percent in the baseline scenario.

- The other three scenarios related to natural disaster events are found to be fiscally more vulnerable as the federal fiscal deficit is up by 1.1 percent to 1.4 percent of GDP over and above the baseline federal fiscal deficit of 3.6 percent in FY2034. Within these scenarios, the one with the establishment of natural disaster fund along with improved revenues (S4) is relatively more promising. As such, it has the advantage of providing funds when they are required to promptly meet the emergent rehabilitation and reconstruction. In this case, the federal fiscal deficit is 4.7 percent of GDP, while the total debt of the government stands at 58.4 percent. However, in the absence of improved revenues, the federal fiscal deficit remains at 5.1 percent of GDP. In comparison, the total debt of the government stands at 59.9 percent of GDP in scenarios 2 and 3.

- Overall, effective fiscal risk mitigation in Pakistan requires proactive planning, diversified funding sources, and targeted policy interventions. By adopting a holistic approach that integrates climate change mitigation with disaster risk management, the government can enhance fiscal resilience and safeguard the socioeconomic fabric against future shocks, especially climate change related ones.

1. INTRODUCTION

1.   The Fiscal Risk Statement is prepared in compliance with Section 4, Sub-Section 3 (b) of the Public Finance Management Act, 2019, which requires to include a statement of fiscal risks in the Annual Budget Statement. Fiscal risks may lead to potential threats or uncertainty in fiscal forecasts. This report aims to provide a stand-alone fiscal risk statement on fiscal implications of climate change related events and their macroeconomic impact based on both quantitative and qualitative analysis.

2.   In the face of global climate challenges, Pakistan emerges as a nation grappling with the disproportionate impact of climate change despite its relatively minor contribution to global greenhouse gas emissions. With ambitious mitigation efforts surpassing its Nationally Determined Contributions (NDCs), Pakistan has embarked on a trajectory to curb emissions, aiming to achieve a notable reduction by 2030.

3.   As Pakistan charts its course towards a sustainable future, it is confronted with the imperative to align its actions with international agreements like the Paris Agreement. Recognizing the urgency, Pakistan has set forth transformative initiatives aimed at curbing greenhouse gas emissions and fostering adaptation strategies. However, the journey towards resilience and sustainability is multifaceted, requiring collaboration across sectors and active involvement from both domestic and international stakeholders. As the nation grapples with escalating climate risks, including rising temperatures and increased climate-related severities, concerted efforts are necessary to navigate the challenges ahead and ensure Pakistan's prosperous and resilient future.

4.   Four scenarios have been assumed to estimate climate-related fiscal risks. Under scenario 1, climate-related fiscal risks arise because of the impact of climate change and natural disaster events due to the rise in average temperature and its volatility, which require mitigation efforts partially funded by the government. Additionally, natural disaster events, notably floods, have inflicted substantial damage on Pakistan. These natural disaster shocks underscore the importance of proactive measures, such as establishing a Natural Disaster Fund, which could mitigate the financial impacts of such events. As such, scenarios 2 and 3 assume the natural disaster shock in FY2030 without and with the Natural Disaster Fund, respectively, whereas scenario 4 assumes an improvement in government revenues along with the establishment of the Natural Disaster Fund.

5.   By implementing the Natural Disaster Fund and combining it with revenue enhancement measures, Pakistan can better shield its economy from the adverse effects of climate-related fiscal risks, promoting resilience and sustainable development in the face of environmental challenges and ensuring fiscal sustainability.

2. CLIMATE CHANGE IN PAKISTAN

6.   Pakistan, despite being responsible for only 0.9 percent of global greenhouse gas (GHG) emissions, stands out as one of the world's most susceptible nations to the repercussions of climate change. Going beyond its NDCs, Pakistan has exceeded mitigation efforts, resulting in an 8.7 percent reduction in emissions between 2016 and 2018. The government, adhering to the GHG emissions trajectory outlined in Pakistan's NDCs 2016, aims to limit emissions to 1,603 million tonnes of carbon dioxide equivalent (Mt CO_2e) by 2030.

7.   For a resilient recovery from natural disasters, the Government has worked on a comprehensive 4RF strategy (Resilient, Recovery, Rehabilitation and Reconstruction Framework), aiming to reduce the adverse impacts of climate change and natural hazards for Pakistan's economy, particularly the agriculture sector, and its population.

8.   Recognizing the imperative to curb GHG emissions further in line with the Paris Agreement's goal of limiting temperature rise to 1.5 - 2°C, the Government of Pakistan is unwavering in its commitment to achieving the maximum possible reduction. To this end, a series of transformative initiatives have been implemented. Consequently, Pakistan aspires to establish an ambitious cumulative target, aiming for a 50 percent reduction in projected emissions by 2030. This target is based on financing a 15 percent reduction below the business as usual (BAU) levels through domestic resources, while reducing an additional 35 percent subject to the provision of international grant finance that would require USD 101 billion just for the energy transition. Furthermore, Pakistan promotes the active involvement of the private sector in realizing its climate goals across various sectors and fostering the development of Nature-based Solutions (NbS) to tackle mitigation and adaptation challenges.

9.   The agriculture sector dominated GHG emissions, emitting 201.76 Mt in 2020 (Climate Watch). Moreover, the energy sector produced CO2 emissions of 193.56 Mt in 2020, reflecting the high emissions volume from the electricity/ heat component in the country, with transport being the second component within the energy sector. Pakistan's 62.8 percent of energy (installed generation capacity of electricity) comes from thermal (fossil fuels), 23.2 percent from hydro, 6.1 percent from renewable (wind, solar, and biomass), and 7.9 percent from nuclear (NEPRA, 2023[1]). To mitigate these emissions, Pakistan is planning the construction of a new nuclear power plant as well as smaller hydroelectric power plants across the country and shifting towards electric vehicles. As such, Pakistan aims to shift renewable energy (hydel, solar, and wind) to 60 percent by 2031, electric vehicles to 30 percent by 2030, and completely ban imported coal (NEPRA, 2023).

10.   The Pakistan National Adaptation Plan[2] (NAP) provides a framework for implementing adaptation, promoting inclusivity, and facilitating collaboration among different stakeholders, and serves as an effective tool for climate finance mobilization. It provides an overview of the country's

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[1]

https://www.nepra.org.pk/publications/State%20of%20Industry%20Reports/State%20of%20Industry%20Report%202023.pdf

[2]https://mocc.gov.pk/PublicationDetail/ZDg5NjgwMjMtMWVkZC00ODMyLTg1NzctNmQzODFhNTVmMWEz

climate risks and vulnerabilities and of the adaptation process, vision, and principles. The plan lays out an adaptation strategy and priorities in seven key areas: the agriculture–water nexus; natural capital; urban resilience; human capital; disaster risk management; and gender, youth, and social inclusion.

11.   NAP showcases the dedication of the government to create a resilient and sustainable environment. This plan goes beyond reacting to existing risks; it represents a proactive step towards ensuring a solid future. However, it is worth noting that this plan is the beginning of a much longer journey. Addressing Pakistan's climate crisis requires active involvement from stakeholders like NGOs and climate ministries in addition to a comprehensive plan. The next step is to develop a plan and mobilize domestic and international collaborative efforts to implement it effectively.

12.   The average temperature in Pakistan has already increased by 1°C since the 1980s and is projected to continue rising. Climate change has exerted significant effects on the Indus River Delta, situated at the confluence of the Indus River and the Arabian Sea. With increased temperatures and rising temperature volatility, Pakistan will see increased climate-related severities in future. The most serious effects of climate change in Pakistan are expected to be an increase in severe drought and volatility in extreme precipitation events, leading to more mudslides and landslides.

13.   Under the unmitigated scenario, Pakistan is projected to become substantially drier, with the SPEI6[3] index reaching -1.5, heading towards severe drought conditions by the end of the century. The high and increasing year-to-year hot days are also likely to lead to an increase in extreme weather events at the right tail of the distribution, increased health problems, lower productivity, drought-related water and food shortages, damage to infrastructure, and disruption in supply chains.

14.   International indices suggest that Pakistan is in the mid-to-high range of exposure to climate-related risks. The INFORM Report 2023[4], which shares evidence for managing crises and disasters, ranks Pakistan as a high-risk country, while the Notre-Dame Global Adaptation Initiative Index[5] (ND-GAIN) gives a high vulnerability score and low readiness score to Pakistan and places it in the upper-left quadrant of the ND-GAIN Matrix. It requires investment along with innovations to improve readiness and a great urgency for action. As such, Pakistan is ranked as the 35th most vulnerable country.

15.   Despite being an almost negligible contributor to global warming, the costs of climate change to Pakistan are substantial and continuously increasing as the country faces severe economic challenges. The accelerated impacts of climate change have added a new layer of pressure on the economy, including the exogenous shock of severe climate disasters, which in 2022 exerted a drag on the country's Gross Domestic Product (GDP). Rising inflation, high

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[3] Standardized Precipitation Evapotranspiration Index

[4] https://www.preventionweb.net/publication/inform-report-2023-shared-evidence-managing-crises-and-disasters
[5] https://gain.nd.edu/our-work/country-index/download-data/

indebtedness, low growth, currency depreciation, and depleted foreign currency reserves have further added to the scale and multitude of challenges.

16.   A comprehensive multi-pronged strategy is required to adapt to and mitigate climate change. Given the growing and cross-cutting challenges posed by climate change, Pakistan needs to urgently prioritize adaptation and building resilience. By proactively addressing climate risks and embedding adaptation strategies in its development and planning frameworks, Pakistan may reduce its economic losses and climate-induced risks, enhance business continuity, and pursue sustainable economic development.

3. NATURAL DISASTER EVENTS IN PAKISTAN

17.   The frequency of climate-related natural disasters has been rising in Pakistan (Figure 1). The most observed hazardous phenomena in Pakistan during the period of 1980-2022 were floods, tropical cyclones, extreme temperatures, and occasional droughts. The floods of 2010 and 2022, and the earthquake of 2005 created huge economic losses, casualties, infrastructure damages, and rehabilitation costs. It has been observed that the intensity of floods has been increasing over the years, which can be attributed to changes in global climate patterns (rising temperature and changing precipitation patterns), melting glaciers, deforestation, and urbanization. The poorly maintained infrastructure, inefficient water management, river-bed encroachment, and haphazard population density also play their part in massive flooding.

Figure 1: Number of Natural Disaster Events
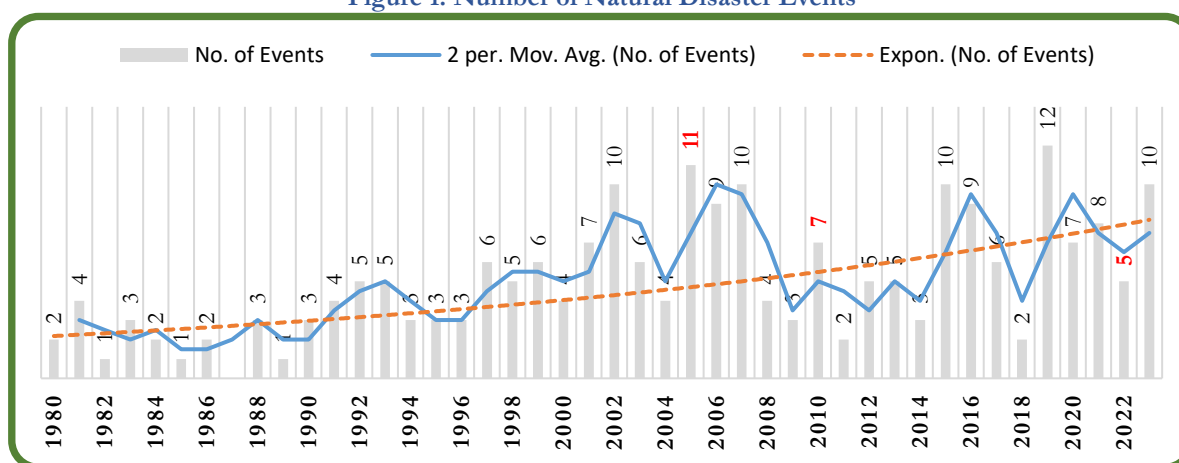
Source: EM-DAT, The International Disaster Database

Table 1: Impact of Past Natural Disaster Events

Disaster Type	Disaster Subtype	Events Count	Total Deaths	Total Affected	Total Damages (000 USD)
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	3	130	59,066	-
	Others	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**
	Others	**35**	**4,600**	**43,124,841**	**1,510,230**
Mass Movement	Avalanche	13	580	4,460	-
	Landslide	9	222	29,707	18,000
	Mudslide	2	16	12	-
	Rockfall	1	13	-	-
Storm	Convective Storm	**16**	**408**	**1,001,903**	**-**
	Tropical cyclone	**5**	**1,106**	**2,189,940**	**1,710,936**
	Others	7	223	3,123	-

Source: EM-DAT, The International Disaster Database

18.   Climate change contributes to prolonged drought episodes in specific regions of Pakistan. Insufficient rainfall and extended water scarcity throughout 2018 resulted in drought conditions

in Balochistan and Sindh. In September of that year, the Sindh government declared significant portions of Southern Sindh as "calamity areas" due to deficient rainfall during the monsoon season. Drought, distinct from other natural disasters, has the characteristic of a gradual build-up over time, and its impacts can persist for several years after its occurrence.

Table 2: Decade-wise Frequency of Natural Disaster Events and their Impact

Year	No. of Events	Total Death	Total Affected	Total Damages (000 USD)
1981 - 1990	20	997	1,234,977	8,000
1991 - 2000	44	6,747	21,116,721	1,360,166
2001 - 2010	71	79,195	37,917,618	17,134,648
2011 - 2020	61	6,189	24,345,290	10,248,000
2021 - 2023	23	2,379	33,195,098	14,910,000

Source: EM-DAT, The International Disaster Database

19.   The 2022 floods have shown Pakistan's high vulnerability 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 in Pakistan, exceeding the damage of the 2010 floods. The damage was estimated at USD 14.9 billion, the loss to the GDP at USD 15.2 billion, and the total need for rehabilitation at USD 16.3 billion.

20.   These floods have caused the most damage to the housing sector, which incurred losses of USD 5.6 billion. The agriculture, food, livestock and fisheries sectors suffered losses worth USD 3.7 billion, while transport and communications suffered losses worth USD 3.3 billion. The transport and communication sector has the highest reconstruction and recovery needs, estimated at USD 5.0 billion, followed by agriculture, food, livestock, and fisheries at USD 4.0 billion, and housing at USD 2.8 billion. The provinces of Sindh and Balochistan account for approximately 50 percent and 15 percent of recovery and reconstruction needs, respectively.

Table 3: Damage and Loss to Pakistan Economy - Floods (PKR Billion)

		Social Sectors	Infrastructure Sectors	Productive Sectors	Cross-Cutting Sectors	Total (PKR Billion)	Total (USD Billion)
2022	Damage	1,345	843	996	18	3,202	14.906
	Loss	193	85	2,853	142	3,272	15.233
2010	Damage	115.451	102.469	330.120	4.133	552.173	6.496
	Loss	50.249	69.648	179.866	2.835	302.599	3.560

Source: Ministry of Planning, Development and Special Initiatives, Government of Pakistan

21.   In 2010, Pakistan experienced extraordinary rainfall that resulted in unprecedented floods affecting the entire length of the country. The rains/floods of 2010 affected over 20 million people. Additionally, flash floods and landslides triggered by the rain caused severe damage to infrastructure in the affected areas. Entire villages were washed away, urban centers were flooded, homes were destroyed, and thousands of acres of crops and agricultural lands had been damaged with major soil erosion happening in some areas.

22.   The Preliminary Damage and Need Assessment Report on Pakistan Floods 2010 presented estimates for direct damage and indirect losses, estimated at approximately PKR 855 billion; the cost of reconstruction needs ranging from PKR 578 billion to 758 billion. The direct damage caused by the floods was estimated at PKR 552 billion (USD 6.5 billion) while indirect losses

amount to PKR 303 billion (USD 3.6 billion). The agriculture, livestock and fisheries sectors suffered the highest damages, estimated at PKR 429 billion (USD 5.0 billion). The report on Floods 2010 also provided a detailed breakdown of the damage costs. Total reconstruction cost is provided across the range of three options, with option one as the base case and option three as the recommended option. The reconstruction cost for the base case is estimated at PKR 578 billion (USD 6.8 billion), while the recommended option costs are estimated at PKR 758 billion (USD 8.9 billion).

23.   The direct causal relationship between earthquakes and climate change remains uncertain and requires further scientific investigation. It's essential to recognize earthquakes as primarily geological events driven by complex interactions within the Earth's crust, rather than direct consequences of climate change. However, their relation with climate change notwithstanding, earthquakes may pose a significant fiscal risk.

24.   In Pakistan, the earthquake that struck on October 8, 2005, left widespread destruction in its wake, killing at least 73,000 people, severely injuring another 70,000, and leaving 2.8 million people without shelter. Azad Jammu and Kashmir and eastern Khyber Pakhtunkhwa (then NWFP) have suffered extensive damage to economic assets and infrastructure, with social service delivery, commerce, and communications either debilitated or destroyed.

25.   Besides the enormous human toll, the earthquake and its aftermath posed large financial costs to Pakistan. The overall cost associated with the 2005 earthquake was estimated at approximately USD 5.2 billion, which included estimated costs for relief, livelihood support for victims, and reconstruction. The Preliminary Damage and Need Assessment Report on the 2005 earthquake presents:

- the loss of public and private assets (direct damage at book value) in the eight most affected districts, estimated at Rs. 135.2 billion (USD 2.3 billion), and the loss in income (indirect loss), estimated at Rs. 34.2 billion (USD 576 million);
- the cost of short-term (up to 18 months) and medium to longer-term (up to three years) reconstruction of private and public assets (at replacement costs), estimated at USD 3.5 billion; and
- the cost of a livelihood restoration program is estimated at USD 97 million.

26.   The impacts of natural disasters, especially floods, extend beyond immediate casualties to include long-term socio-economic repercussions. Loss of life and displacement of communities are evident from the data, with thousands of deaths and millions affected by flood events. Moreover, the economic toll, as indicated by the substantial damages incurred, underscores the strain on national resources for disaster response, recovery, and rebuilding efforts.

27.   Climate change exacerbates the vulnerability of Pakistan to floods by altering precipitation patterns, intensifying extreme weather events, and increasing the frequency and severity of floods. Rising global temperatures contribute to the melting of glaciers and increased water runoff, further exacerbating flood risks, particularly in mountainous regions. Additionally, changing weather patterns can lead to unpredictable monsoon rains, amplifying the likelihood of flash floods and riverine inundation.

28.   Addressing Pakistan's vulnerability to floods requires a multifaceted approach that includes short-term disaster response and long-term climate adaptation and mitigation strategies. Investing in robust early warning systems, resilient infrastructure, sustainable land use practices, and community-based disaster preparedness measures is crucial for enhancing the country's resilience to climate change related events like floods.

29.   Regional cooperation, knowledge-sharing, and international support are essential for effectively addressing the transboundary nature of flood risks in South Asia. By prioritizing proactive measures to mitigate flood risks and build climate resilience, Pakistan can better adapt to the challenges posed by climate change and protect the lives and livelihoods of its population.

4. CLIMATE CHANGE RELATED EVENTS SCENARIOS

30. Climate change tends to affect different drivers of economic growth by creating vulnerabilities in the economy. A persistent rise in temperature, changes in precipitation patterns, and more volatile weather events adversely affect labour productivity, slowing capital accumulation and damaging human health (Kahn et al., 2021). Additionally, climate change has potential impacts on productivity, land, capital, and labour. Extreme weather events result in landslides, creating production input shortages, infrastructure degradation, deterioration in population health, and human life losses.

31. Gradual transformation of the environment results in land degradation with the reduction in agricultural potential output, scarce land resources in some regions, faster depreciation of machinery/equipment, reallocation of resources from productive capital to adaptation investment in healthcare, reduced human performance due to higher temperature, resource reallocation to new technologies, loss of hours worked due to extreme temperatures, employment and social impacts of climate change policies, and resource reallocation (European Commission, 2020).

32. On the other side, the effects of climate change on public finances also materialize via increased public spending on subsidies, relief measures, and repairing or replacing damaged infrastructure.

33. A full-fledged climate change fiscal risk analysis should include long-term fiscal sustainability considerations. Ideally, climate change affects a government's ability to sustain its spending and taxes in the long run without threatening its solvency or defaulting on any of its liabilities.

34. This report has identified and modelled the scenarios to analyze the impact of climate change on the fiscal position of the government. This allows the fiscal authorities to establish a view on the scale of adjustment that may be needed under various climate change scenarios. The development of the approach starts with the design of a simplified long-term framework that is then gradually developed and refined.

35. The analysis starts with developing the simple long-term baseline fiscal framework with an assumption of no change in climate over time as well as public finance structure. In the next phase, the report moves towards a 'climate change target scenario'. It incorporates high government spending in the form of investment in environment-friendly projects for six years, i.e., FY2025 to FY2030, to fulfill its international commitment of a 50 percent reduction in emissions where a 15 percent drop is to be financed from the country's resources, and an additional 35 percent drop is subject to international financial support. The analysis also contains the 'Green Investment Framework' including enhanced economic activity and consequent government revenues.

36. The potential fiscal impact of climate change related natural disasters has also been analyzed. When natural disasters, such as flooding or drought, materialize, they tend to reduce revenue due to lower tax collection resulting from the impact on economic sectors and require government spending for post-disaster recovery and rehabilitation efforts.

37. This report quantifies the potential impact by analyzing the historical pattern of natural disasters and projected vulnerabilities and affiliated economic and budgetary costs. One-time

natural disaster shock is assumed in FY2030 in three variant situations: with and without maintaining the natural disaster fund, and improvement on revenue mobilization in addition to the natural disaster fund. The sources and risk exposure are defined in Table 4.

38.   The report provides fiscal implications of climate change events and their macroeconomic impact based on both quantitative and qualitative analysis.

Table 4: Key Sources of Climate-related Fiscal Risks

Source of Risk	Risk Exposure	Scenarios
Climate Change	The rise in average degree temperature and its volatility.	Climate change mitigation expenditures are assumed to be partially contributed by the government, as envisaged in NDC 2021; economic activity and government revenues are increased due to improved climate (S1).
Natural Disaster Event	Among the climate-related Natural Disaster Events, Floods have been the most damaging for Pakistan. Flood 2022 contributed to a 2.2 percent GDP downturn and resulted in an estimated USD 16.2 billion in rehabilitation costs. Natural disaster Shock is given in FY2030	Without the Natural Disaster Fund (S2)
		With the Natural Disaster Fund (S3)
		With the Natural Disaster Fund and increased government revenues due to improvements in governance and tax policy changes (S4).

4.1 Green Investment Framework (S1)

39.   This Scenario entails the financing requirement for climate change mitigation in Pakistan by 2023 as envisaged in NDC 2021 to reduce 15 percent emissions below the Baseline or BAU, subject to the provision of international grant finance for 35 percent emissions reduction. The climate change mitigation or decarbonization requirement of USD 196 billion (56 percent of the total USD 348 billion), as estimated by the World Bank, is assumed to be a target for the next six fiscal years, which has serious fiscal implications.

40.   It is also important to note that public investment has fiscal multiplier implications for economic growth. Furthermore, revenue benefits, consequent upon the increased economic activity, are included in the projections.

4.2 Natural Disaster Shock: Without Natural Disaster Fund (S2)

41.   This scenario analyses the impact of natural disaster shock, which is assumed to hit the country in FY2030 (one-time shock). It incorporates negative macroeconomic implications and increased government expenditures. For instance, this hypothetical shock simulates 2.5 percentage point loss in real GDP growth (as compared to the 2.2 percentage point loss of Floods-2022), 4 percentage points higher inflation, and 15 percent additional exchange rate depreciation than the baseline scenario. The negative impact of this natural disaster event on real GDP growth and inflation is simulated to dilute in three years. Furthermore, government expenditures (over and above the reallocation) of 5.3 percent of GDP, spread over a span of five years from 2.0 percent of GDP in FY2030 to 0.5 percent in FY2034. In this scenario, revenues are assumed to be similar to the baseline scenario.

4.3 Natural Disaster Shock: With Natural Disaster Fund (S3)

42.   This scenario has one difference from the Natural Disaster Scenario, i.e., it includes establishing a Natural Disaster Fund. Total damages from natural disasters for the last ten years, as evident from the data available in EM-DAT, amounts to a total of USD 20 billion approximately, which is, on average, like the preceding ten years including the earthquake of October 2005. As such, Pakistan hits with a major natural disaster once in ten years. Utilizing the concept of probability theory, Pakistan requires USD 2 billion every year to deal with the rehabilitation efforts by the private and public sectors. It is assumed that the government may share 25 percent of the total damages out of which $1/3^{rd}$ of the expenditures is managed from reallocation and $2/3^{rd}$ to be financed from the natural disaster fund. This investment fund will be invested in relatively liquid assets so that these can be available in monsoon season, assuming floods are the most damaging event historically.

43.   The natural disaster fund is a financial reserve that is suggested to be established by the federal government with the support of organizations and the community to provide assistance and support in the aftermath of natural disasters. These funds are typically used for emergency response efforts, including search and rescue operations, medical assistance, shelter, food, and rebuilding infrastructure. The purpose of this fund is to ensure that resources are readily available to respond effectively and efficiently to the needs of affected individuals and communities during times of crisis.

44.   Funding for natural disaster funds can come from various sources, including government allocations, donations from individuals and businesses, international aid, and insurance payouts. These funds should be managed and administered by the relevant government organization, as feasible, in collaboration with local authorities and community stakeholders. Establishing and maintaining natural disaster funds are essential components of disaster preparedness and resilience-building efforts, as they help ensure that communities are better equipped to respond to and recover from natural disasters when they occur. Additionally, they contribute to the overall stability and safety of communities by providing a financial safety net in times of crisis.

4.4 Natural Disaster Shock: With Natural Disaster Fund and Improved Revenues (S4)

45.   This scenario is similar to the Natural Disaster Shock (With Natural Disaster Fund) except that it also assumes an increase of 0.2 percentage point of GDP in federal government revenues against the baseline projections starting from FY2025 to FY2034, due to improved governance structure and tax policy changes.

5. ANALYSIS OF THE BASELINE FRAMEWORK

46.   A careful approach is adopted to forecast key macroeconomic and fiscal indicators in the comprehensive projection process[6]. Given the significance and robustness required in these forecasts, the Autoregressive Distributed Lag Model (where relevant) emerges as a predominant tool for predicting most macroeconomic and fiscal aggregates. This model, recognized for its relevance and rigour, offers a comprehensive framework for forecasting, contributing to the overall coherence of the projections. Additionally, the projections extend to crucial aspects such as imports, as well as the demand for High-Speed Diesel (HSD) and Motor Spirit (MS), providing a holistic view of economic dynamics.

47.   Pakistan's economy has experienced 'boom-bust' episodes during the past 5 years, encountering a W-shaped growth curve. During the last two years, the country's economy encountered a complex and challenging environment marked by global crises and domestic economic slowdown. Global supply shocks, exacerbated by geopolitical tensions, coupled with the domestic natural disaster (Flood-2022), high inflation, exchange rate depreciation, tight economic policies, and political instability, heightened growth vulnerabilities, resulting in a 0.17 percent contraction in GDP in FY2023. Against this negative growth, the current fiscal year has shown both resilience and revival.

48.   At the outset of the new fiscal year, the government prioritized stabilizing the economy, fostering growth, and reinstating market confidence. To achieve these goals, proactive measures were implemented to address economic challenges and create a conducive environment for sustainable development. Central to the stabilization efforts was the USD 3.0 billion IMF SBA, approved in July 2023, leading to a successful completion in April 2024, expected to be followed by another 3-year IMF programme. A key component of the stabilization strategy involved normalizing trade and investment flows by lifting import bans that hindered raw material availability for industries. Additionally, measures were taken to stabilize currency speculation. With appropriate policy actions and improved agricultural output, inflation declined to 20.7 percent in March 2024, down from its peak of 38.0 percent in May 2023.

49.   The government remains attentive to macroeconomic developments and is fully committed to ensuring sustainable economic growth over the long term. Sector-specific measures in agriculture, industry, and services, coupled with fiscal consolidation, energy sector reforms, state-owned enterprise (SOE) reforms, and governance improvements, are being devised to propel the economy towards higher and sustainable growth. Both federal and provincial governments are collaborating to achieve growth targets while maintaining price stability at the stable long-run level.

50.   The State Bank of Pakistan (SBP) actively responds to high inflation by raising the policy rate. As per the SBP Amendment Act 2021, the primary objective of inflation targeting by the SBP is to devise a strategy/mechanism to move in the direction of achieving the targeted inflation rate.

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[6] These forecasts are developed assuming a stable economic environment. Therefore, these may not necessarily reflect the medium to long term strategy or plan of the government.

Moreover, the government is also focusing on effective policy, administrative and relief measures to control inflation.

51.   In the context of the baseline scenario, the evolution of the fiscal situation unfolds within the confines of current policies and with the pace of climate change. This scenario is characterized by specific parameters that collectively shape its trajectory. Notably, the assumed population growth rate is set at 2.5 percent. Additionally, both the labour share and participation rate are held constant at their current level of 60 percent. Within this framework, other critical factors contributing to the fiscal landscape are maintained at specific values: the depreciation rate is set at 3.5 percent per year, the growth in the human capital index at 0.7 percent, and the total factor productivity at 0.9 percent. Importantly, these assumptions are not arbitrary; instead, they are aligned with historical long-term trends and recent macroeconomic realities. This alignment is integral, as these assumptions are anticipated to remain unchanged until the year 2034 under the baseline scenario. The model projects real GDP to grow at 2.6 percent in FY2024 whereas, for subsequent years, GDP growth exhibits a sustained recovery and expansion of economic activities, stabilizing around a steady-state level (Figure 2).

Figure 2: Real GDP Growth Forecast under Baseline Scenario
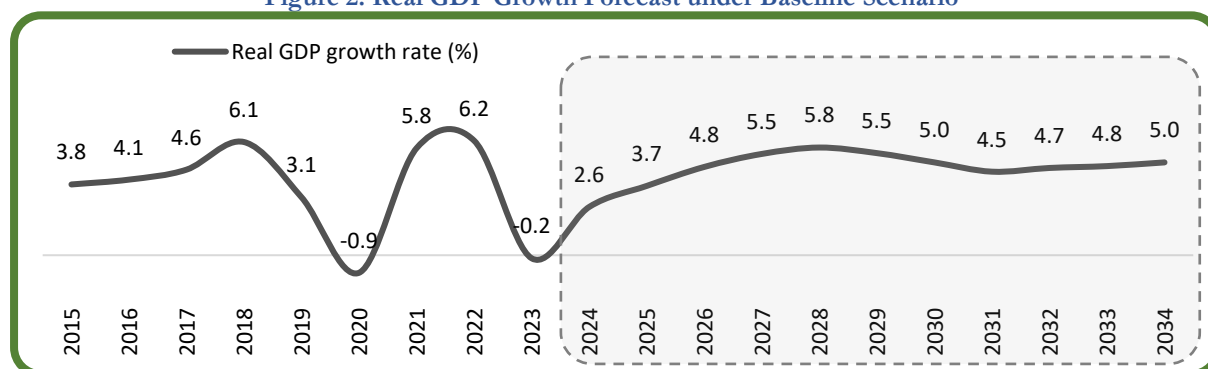
52.   Inflation was relatively high from FY2011 to FY2014, gradually decreasing until FY2019, before experiencing fluctuations and a significant spike in FY2022 and FY2023 as multiple shocks hit the economy. Looking ahead, several factors may influence future inflation rates, including economic growth, monetary and fiscal policies, supply chain, exchange rates, and labour market conditions.

53.   The projected decline in inflation rates (Figure 3) from FY2024 to FY2034 suggests a gradual stabilization, albeit with potential short-term fluctuations due to various factors. While forecasts indicate a plausible trajectory based on historical trends and economic forecasts, it's crucial to remain vigilant to potential risks and uncertainties that could impact inflation dynamics, necessitating ongoing monitoring and adjustment of projections as needed.

Figure 3: Inflation Forecast under Baseline Scenario

Inflation Average (% YoY)

Year	Value
2015	4.5
2016	2.9
2017	4.8
2018	4.7
2019	6.8
2020	10.7
2021	8.9
2022	12.2
2023	29.2
2024	24.0
2025	11.8
2026	7.5
2027	7.0
2028	7.0
2029	7.7
2030	8.2
2031	8.7
2032	8.0
2033	7.5
2034	8.1
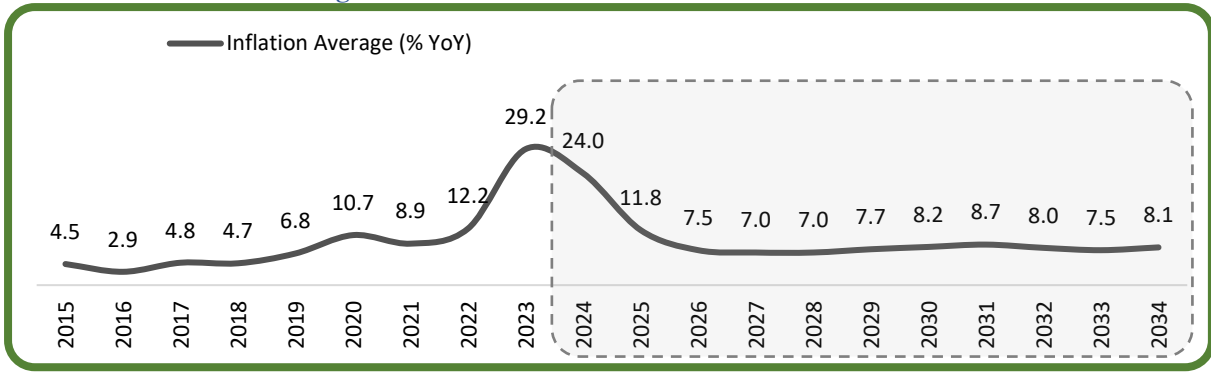
54.   By adopting a multifaceted approach that combines fiscal, monetary, and structural measures, Pakistan can better navigate the challenges posed by the recent stagflation and work towards achieving positive economic growth. Since the last fiscal year, the government has been focusing on fiscal consolidation as a priority to achieve macroeconomic stability, enhance investor confidence, and create a sustainable fiscal outlook.

55.   On the revenue side, the government plans to implement tax reforms, broadening the tax base to include sectors like retail, agriculture, and real estate. Furthermore, the digitization of the tax system is the top priority. Simultaneously, on the expenditure side, austerity measures are considered important to rationalize government spending. This includes a thorough review of subsidies and grants to ensure their efficiency and necessity. SOE reforms will also contribute to reducing fiscal strain.
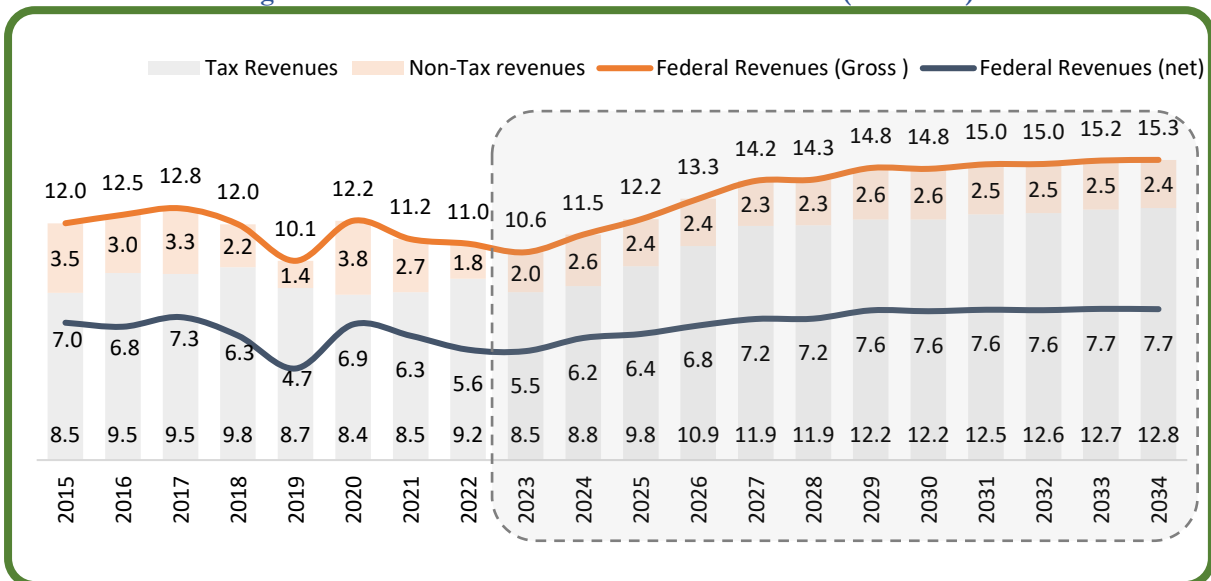
56.   Long-term fiscal projections necessitate a comprehensive approach, relying on macroeconomic assumptions and forecasts as foundational elements. The estimation of both direct and indirect tax revenues entails the application of rigorous econometric methods. Within this framework, various revenue streams, including direct tax, customs duty, sales tax from both imports and domestic production, as well as federal excise duty, are forecasted. These individual forecasts are methodically aggregated using the identity equation, providing a cohesive and systematic foundation.

Figure 4: Revenue Forecasts under Baseline Scenario (% of GDP)

Tax Revenues — Non-Tax revenues — Federal Revenues (Gross) — Federal Revenues (net)

Year	Federal Revenues (Gross)	Non-Tax revenues	Federal Revenues (net)	Tax Revenues
2015	12.0	3.5	7.0	8.5
2016	12.5	3.0	6.8	9.5
2017	12.8	3.3	7.3	9.5
2018	12.0	2.2	6.3	9.8
2019	10.1	1.4	4.7	8.7
2020	12.2	3.8	6.9	8.4
2021	11.2	2.7	6.3	8.5
2022	11.0	1.8	5.6	9.2
2023	10.6	2.0	5.5	8.5
2024	11.5	2.6	6.2	8.8
2025	12.2	2.4	6.4	9.8
2026	13.3	2.4	6.8	10.9
2027	14.2	2.3	7.2	11.9
2028	14.3	2.3	7.2	11.9
2029	14.8	2.6	7.6	12.2
2030	14.8	2.6	7.6	12.2
2031	15.0	2.5	7.6	12.5
2032	15.0	2.5	7.6	12.6
2033	15.2	2.5	7.7	12.7
2034	15.3	2.4	7.7	12.8

57.   The resulting projections are seamlessly integrated into an Excel-based analytical tool, enhancing the precision and reliability of the fiscal outlook. This meticulous process ensures a robust and coherent basis for long-term fiscal planning and decision-making. Figure 4 shows a steady rise in FBR Revenues as a percentage of GDP, in the baseline scenario, from 8.5 percent in FY2023 to 12.8 percent in FY2034. The depiction of non-tax revenues as a percentage of GDP reveals a trajectory starting at 2 percent of GDP in FY2023 and leading to 2.4 percent by FY2034. Nevertheless, any shifts in policy or the emergence of new avenues for the collection of tax and non-tax revenues have the potential to alter these projections.

58.   Gross revenue receipts, representing the amalgamation of tax and non-tax revenues over the entire forecasted period up to FY2034, constitute a critical fiscal metric. This upward trajectory suggests a substantial growth in the overall fiscal inflows over the forecasted period. Following this, the application of the resource distribution formula under the National Finance Commission (NFC) award becomes instrumental. Through this formula, the net revenue receipts of the Federal Government are meticulously calculated.

Figure 5: Expenditure Forecasts under Baseline Framework (% of GDP)
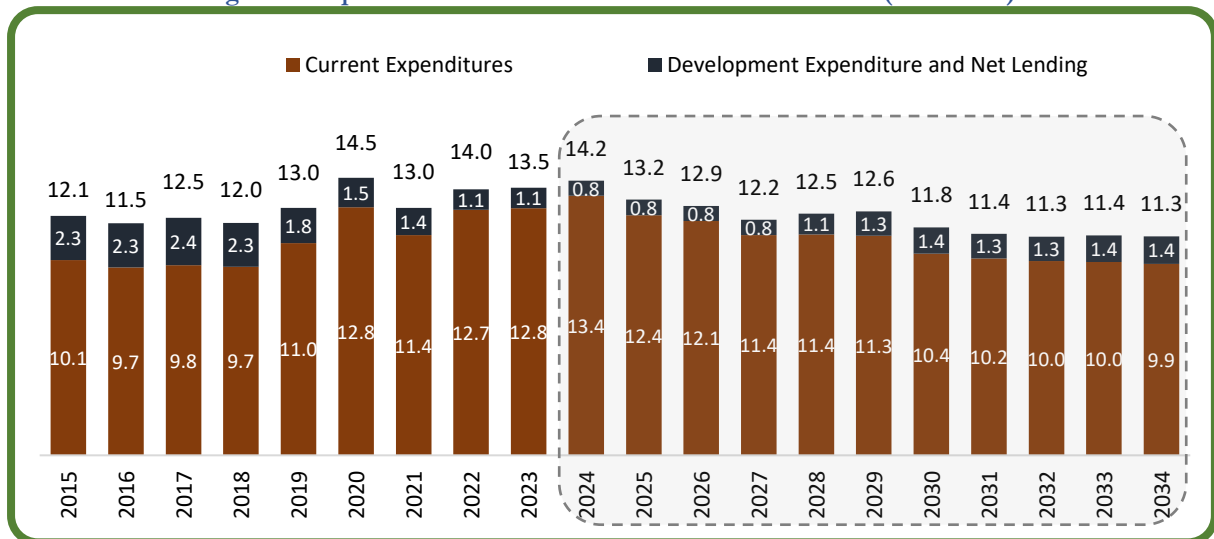
59.   Within the scope of current expenditures, distinct components contribute to the fiscal landscape, going beyond markup payments. A stable economic environment including sustainable economic growth and stable inflation and interest rate projections are the main drivers, highlighting an overall decline in current expenditures as a percentage of GDP over the long run. Furthermore, it provides fiscal space for meeting the other expenditures more comfortably.

Figure 6: Forecasts of Fiscal Deficit and Total Debt of the Government (% of GDP)

Legend: Federal Fiscal Balance, Debt Stock

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Debt Stock	57.1	60.1	60.2	63.7	74.7	76.6	71.4	73.9	74.8	67.4	65.2	64.7	63.4	62.1	60.4	58.2	55.9	53.8	52.2	50.2
Federal Fiscal Balance	-5.1	-4.8	-5.2	-5.7	-8.3	-7.6	-6.7	-8.4	-7.9	-8.0	-6.8	-6.0	-5.0	-5.3	-5.0	-4.2	-3.8	-3.7	-3.7	-3.6
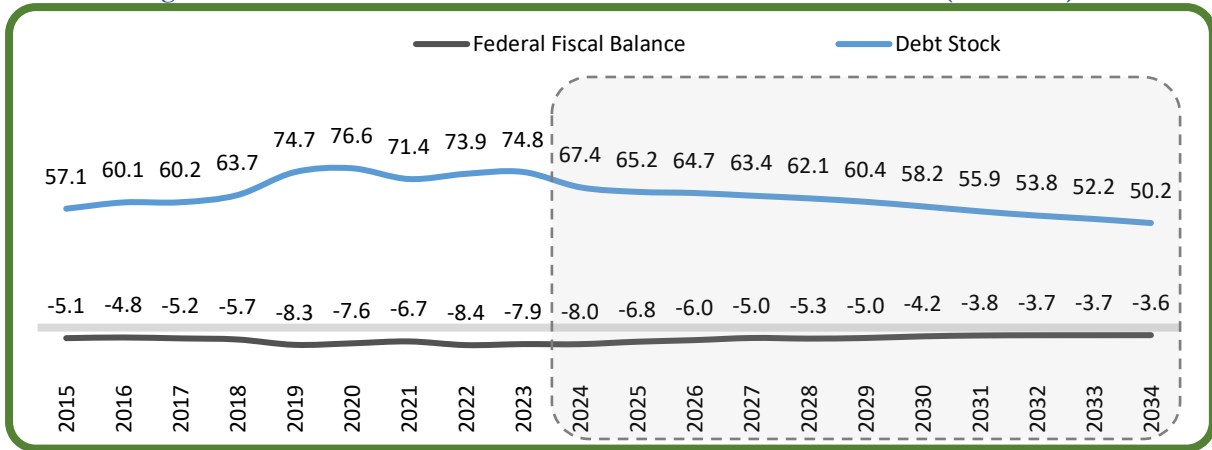
60.   Fiscal consolidation requires federal and provincial governments to reduce fiscal deficit and prevent the accumulation of debt. The baseline scenario outlines a strategic approach wherein provincial governments are envisaged to maintain an overall fiscal surplus in the long run, aligning with the existing fiscal strategy. While the fiscal indicators show a trajectory towards improved fiscal sustainability over the long term, continued efforts in revenue enhancement and expenditure rationalization are essential to ensure long-term fiscal stability and debt sustainability.

6. FISCAL RISK ANALYSIS

61.   Conducting a risk analysis is imperative to evaluate the potential vulnerabilities associated with each climate change related scenario explained in section 4. Considerations include economic conditions, policy uncertainties, and external shocks that may influence fiscal outcomes. By assessing the risk exposure inherent in different scenarios, policymakers can make more informed decisions and implement appropriate measures to mitigate fiscal risks effectively.

6.1 Fiscal Risk Analysis under Climate Change related Scenarios[7]

62.   Figure 7 presents a comparative analysis of the federal fiscal deficit projections across the baseline and the four alternative scenarios spanning from FY2024 to FY2034, along with the actual values from FY2015 to FY2023. The federal fiscal deficits for the four alternative scenarios are labelled S1, S2, S3, and S4. By examining patterns in the evolution of the fiscal deficit, analysts can discern any noteworthy deviations or spikes that may occur in specific fiscal years or scenarios. As such, scenario 1 is more promising in the long run because of the macroeconomic implications of activating the private sector for climate financing and government expenditures. Furthermore, it will have positive implications on government revenue receipts due to increased economic activity. Contrary to this, scenarios 2 and 3 highlight the most vulnerable situation where a major natural disaster event hits the country and the subsequent need to plug in the expenditures by the government for rehabilitation and reconstruction, assumed to be equal to 5.3 percent of GDP over the period from FY2030 to FY2034. As such, the federal fiscal deficit will increase to 6.6 percent of GDP in FY2030 from 5.2 percent in FY2029 and then decrease to 5.1 percent in FY2034 under scenarios 2 and 3. Lastly, scenario 4 (natural disaster shock in the presence of improved revenues) is more promising compared to scenarios 2 and 3, given a lower federal fiscal deficit of 4.8 percent of GDP in FY2034.

Figure 7: Fiscal Risk Analysis: Federal Fiscal Balance (% of GDP)
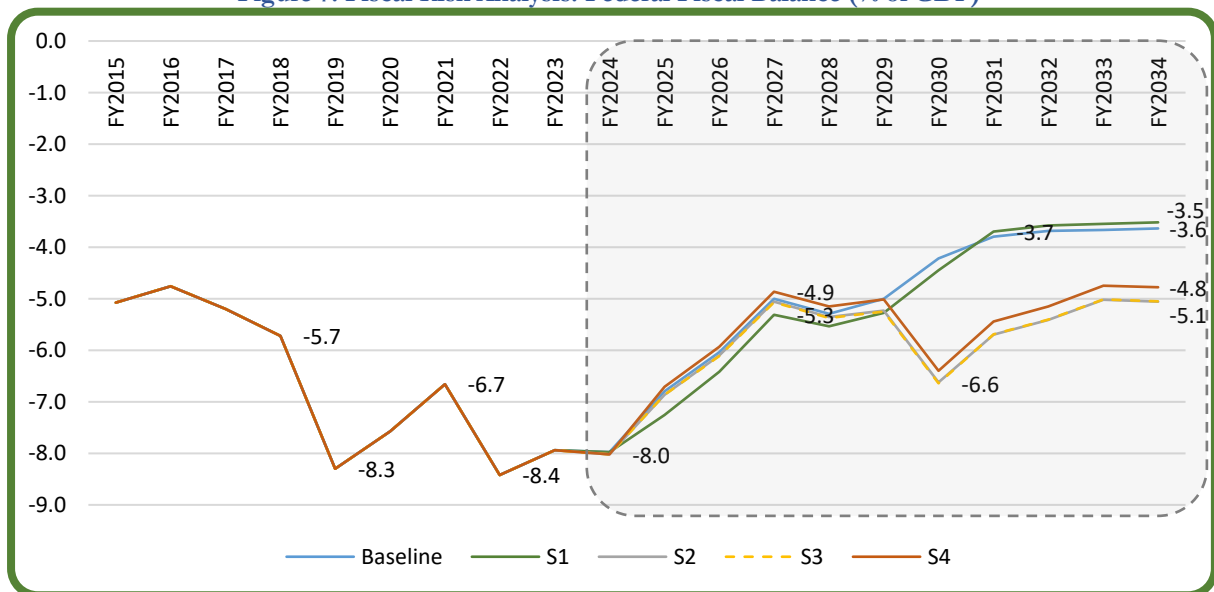
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63.   The federal fiscal deficit is projected to be significantly higher in S1 than the baseline scenario for the six fiscal years in which green investment takes place, due to partial financing by the government for contribution by the country to reduce carbon emissions. However, such financing is conditioned upon the provision of international grant finance for 35 percent reduction in carbon emissions for climate change mitigation. As such, the international grant is not included in the debt of the government; therefore, it will have no implications on the debt stock. It also includes the positive implications of increased economic activity on revenue receipts of the government due to green investment by the government and the private sector to mitigate climate change by 15 percent reduction in carbon emissions by 2030. It is also important to understand the positive implications of these expenditures in driving economic growth above the baseline projections due to the impact of the fiscal multiplier[8]. Furthermore, these expenditures will not hurt the long-run fiscal sustainability, if comparing the federal and overall fiscal deficits in FY2034. As such, in addition to economic benefits, the net present value of revenue benefits of making these expenditures will be higher than that of the government expenditures in the long run.

64.   Scenario 2 analyzes the impact of a natural disaster shock in the absence of a natural disaster fund, as discussed in paragraph 41. Natural disaster events, especially in cases of greater damages that cannot be dealt with by the affected segment of the population alone, require the government to come into action to deal with rehabilitation and reconstruction. Assuming it may require expenditures of 5.3 percent of GDP spread over the fiscal year a natural disaster hits the country, and for four subsequent years (FY2030 to FY2034), the fiscal deficit (both federal and overall) and the government's debt will increase significantly. For instance, the federal fiscal deficit will increase by 2.4 percentage points of GDP in FY2030 compared to the baseline and remain high for the subsequent years albeit with a declining trend. However, in FY2034, the fiscal deficit will be only 1.4 percentage points higher than the baseline. Likewise, the overall fiscal deficit will increase to 4.7 percent of GDP in FY2034 against 3.2 percent in the baseline scenario. It may be noted that expenditures of 5.3 percent of GDP are assumed to meet only 2/3rd of the requirement to cope with the natural disaster, whereas the remaining 1/3rd of the expenditures will be arranged from the reallocation of funds from other heads of the government account.

Table 5: Fiscal Risk (Deviations from the Baseline) under Alternative Scenarios: Federal Fiscal Balance (% of GDP)

Fiscal Year	S1	S2	S3	S4
FY2025	-0.5	-0.1	-0.1	0.1
FY2026	-0.4	-0.1	-0.1	0.1
FY2027	-0.3	-0.1	-0.1	0.1
FY2028	-0.2	-0.1	-0.1	0.1
FY2029	-0.3	-0.2	-0.2	0.0
FY2030	-0.2	-2.4	-2.4	-2.2
FY2031	0.1	-1.9	-1.9	-1.6
FY2032	0.1	-1.7	-1.7	-1.5
FY2033	0.1	-1.4	-1.4	-1.1
FY2034	0.1	-1.4	-1.4	-1.1

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[8] Fiscal multiplier of 0.9 is employed which is in-line with the literature on Pakistan.

65.   Scenario 3, as depicted in paragraphs 42 to 44, suggests establishing a natural disaster fund to deal with the rehabilitation and reconstruction needs immediately in the aftermath of the natural disaster event. It will have similar consequences for federal and overall fiscal deficits, as analyzed in scenario 2. However, this scenario may be more realistic considering that most of the funds will be readily available at the time of need and efficacy of the disaster response.

66.   Scenario 4, which is a variant of scenario 3, also includes the improved federal revenue. This is relatively more promising compared to the other two scenarios of natural disaster shock, S2 and S3. For instance, federal and overall fiscal deficits will increase by 2.2 percentage points of GDP in the year of the natural disaster event (FY2030). By FY2034, the federal and overall fiscal deficit will be 1.1 percentage points higher than the federal fiscal deficit of 3.7 percent of GDP under the baseline scenario (4.8 percent of GDP in scenario 4 as compared to 5.1 percent in scenarios 2 and 3 in FY2034).

6.2 Analyzing Total Debt of the Government under Climate Change related Scenarios

67.   Figure 8 depicts the trend of total debt of the government under different climate change related scenarios in comparison with the baseline. In line with the implications of different scenarios for the federal fiscal deficit, the total debt of the government highlights the vulnerability or the increased debt burden on the government. Scenario 1 highlights relatively more debt than the baseline scenario, especially in the medium term, as green investment by the government is met through borrowing. However, in the long term (by FY2034), the higher debt burden due to green investment is diluted as the total debt of the government is marginally higher (by 0.9 percentage points of GDP), standing at 51.1 percent of GDP against 50.2 percent in the baseline scenario. However, under three other scenarios of a natural disaster shock in FY2030, scenario 4 signifies the importance of improved federal revenue. As such, the total debt of the government stands at 58.4 percent under scenario 4, compared to 59.9 percent of GDP in scenarios 2 and 3.

Figure 8: Total Debt of the Government as Percentage of GDP under Different Scenarios (% of GDP)

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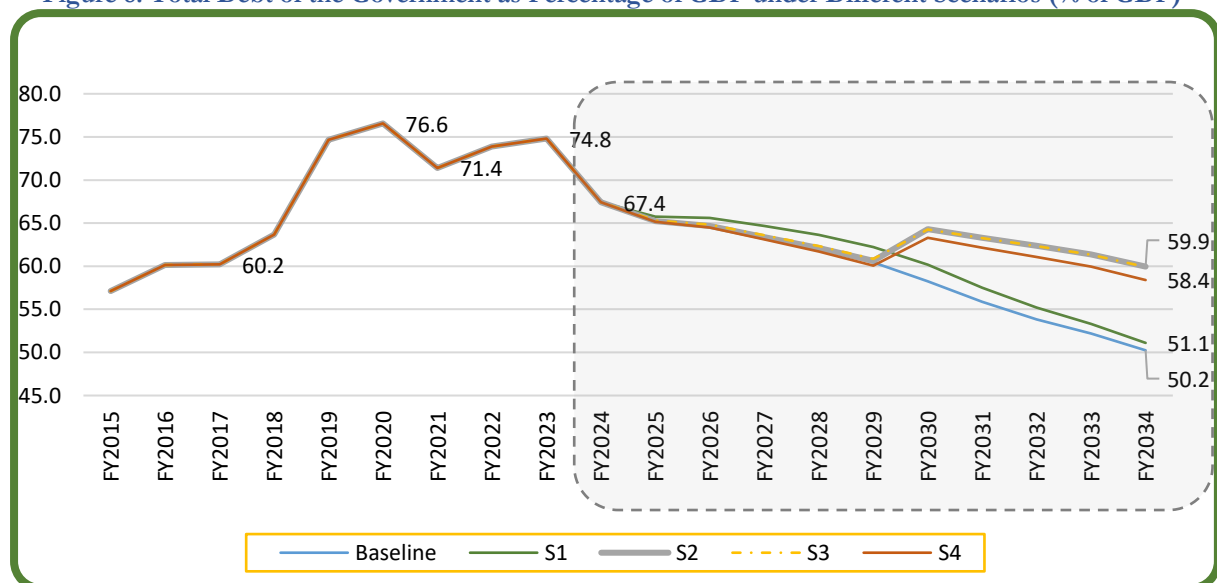
68.　Under scenario 1, the total debt of the government will be only 0.9 percentage points of GDP higher than 51.2 percent in the baseline scenario. It is important to note that in the presence of green investment by the government and the private sector, GDP will be higher than the baseline because of the impact of fiscal and investment multipliers. It will also lead to an increase in government revenues aided by higher economic activity. It also means that this difference can vanish if the increase in government revenues is aligned with green expenditures. Deriving financing by the private sector for projects of climate change mitigation like investment in renewable energy projects, and corporate farming for climate-resilient agriculture practices, accompanied by the right policy mix, will be of greater significance to ensure climate change mitigation.

69.　The total debt of the government will be higher by 9.7 percentage points of GDP, under scenarios 2 and 3 compared to the baseline. In case, if the government avoids prompt response to the natural disaster, it can have more severe socioeconomic implications for a longer period. Moreover, the total debt of the government will be lower than scenarios 2 and 3 given enhanced government revenues, as in scenario 4. However, further improvement in debt sustainability hinges upon more revenue mobilization efforts by the government.

Table 6: Analysis of Deviations in Total Debt of the Government (% of GDP) under Different Scenarios from the Baseline

Fiscal Year	S1	S2	S3	S4
FY2025	0. 5	0. 0	0. 1	−0. 1
FY2026	0. 9	0. 0	0. 1	−0. 2
FY2027	1. 3	0. 0	0. 2	−0. 3
FY2028	1. 5	0. 0	0. 2	−0. 4
FY2029	1. 8	0. 2	0. 4	−0. 4
FY2030	2. 0	6. 1	6. 0	5. 1
FY2031	1. 7	7. 4	7. 4	6. 3
FY2032	1. 4	8. 5	8. 5	7. 3
FY2033	1. 1	9. 2	9. 1	7. 7
FY2034	0. 9	9. 7	9. 7	8. 2

70.　By leveraging these insights, policymakers can make informed decisions to navigate uncertainties, mitigate fiscal risks, and promote sustainable fiscal outcomes in the face of evolving economic dynamics and policy challenges. As such, natural disaster shocks imply a significant negative impact on fiscal aggregates. Recommendations may include measures to enhance fiscal resilience, address fiscal imbalances, and promote long-term fiscal sustainability. Balancing short-term fiscal objectives with the imperative of safeguarding long-term fiscal health becomes paramount in guiding policy responses to the variations observed across different scenarios.

7. CONCLUSION

71.   This analysis encompasses economic conditions, policy uncertainties, and climate change related shocks, enabling policymakers to make informed decisions. By understanding the risk exposure inherent in different scenarios, appropriate measures can be implemented to mitigate fiscal risks effectively.

72.   In Pakistan, mitigating fiscal risks arising from climate change and consequent natural disasters necessitates a multifaceted approach. It highlights the importance of securing international grant finance for climate change mitigation. To mitigate the associated fiscal risks, the government could explore diversified funding sources, while leveraging private sector investment in climate-resilient projects. This could involve incentivizing investment in renewable energy projects and promoting climate-resilient agricultural practices through targeted policies and financial mechanisms.

73.   Scenario 2 underscores the significance of establishing a natural disaster fund to mitigate fiscal risks associated with sudden shocks. To address this, the government could consider setting aside a portion of its budget for disaster preparedness and response efforts. Additionally, partnerships with international organizations and donors could be improved to enhance financial resilience and ensure a timely response to natural disasters.

74.   Scenario 3 highlights the importance of a dedicated natural disaster fund for better preparedness and resilience-building efforts for enhancing community response and recovery capabilities during the occurrence of natural disaster events, while also bolstering overall community stability and safety through the provision of a financial safety net during crises.

75.   Scenario 4 presents an opportunity to integrate climate change mitigation efforts with disaster risk management strategies. With an improvement in government revenues and channeling revenues towards climate-resilient infrastructure and adaptation measures, the government can simultaneously address both environmental and fiscal challenges. Additionally, leveraging innovative financing mechanisms, such as catastrophe bonds or insurance, can provide additional financial protection against natural disaster risks.

76.   Overall, effective fiscal risk mitigation in Pakistan requires a combination of proactive planning, diversified funding sources, and targeted policy interventions. By adopting a holistic approach that integrates climate change mitigation with disaster risk management, the government can enhance fiscal resilience and safeguard against future shocks.

Appendix

Table 1-A: Fiscal Risk Assessment of Green Investment Scenario (S1)

Fiscal Year	Federal Fiscal Balance Gap	Overall Fiscal Balance Gap	Total Debt of the Government Gap
FY2025	-0.5	-0.5	0.5
FY2026	-0.4	-0.4	0.9
FY2027	-0.3	-0.3	1.3
FY2028	-0.2	-0.2	1.5
FY2029	-0.3	-0.3	1.8
FY2030	-0.2	-0.2	2.0
FY2031	0.1	0.2	1.7
FY2032	0.1	0.2	1.4
FY2033	0.1	0.2	1.1
FY2034	0.1	0.2	0.9

Table 2-A: Fiscal Risk Assessment of Natural Disaster (no natural disaster Fund) Scenario (S2)

Fiscal Year	Federal Fiscal Balance Gap	Overall Fiscal Balance Gap	Total Debt of the Government Gap
FY2025	−0.1	−0.1	0.0
FY2026	−0.1	−0.1	0.0
FY2027	−0.1	0.0	0.0
FY2028	−0.1	0.0	0.0
FY2029	−0.2	−0.2	0.2
FY2030	−2.4	−2.4	6.1
FY2031	−1.9	−1.9	7.4
FY2032	−1.7	−1.7	8.5
FY2033	−1.4	−1.4	9.2
FY2034	−1.4	−1.4	9.7

Table 3-A: Fiscal Risk Assessment of Natural Disaster (with Natural Disaster Fund) Scenario (S3)

Fiscal Year	Federal Fiscal Balance Gap	Overall Fiscal Balance Gap	Total Debt of the Government Gap
FY2025	−0.1	−0.1	0.1
FY2026	−0.1	−0.1	0.1
FY2027	−0.1	−0.1	0.2
FY2028	−0.1	−0.1	0.2
FY2029	−0.3	−0.2	0.4
FY2030	−2.4	−2.4	6.0
FY2031	−1.9	−1.9	7.4
FY2032	−1.7	−1.7	8.5
FY2033	−1.3	−1.4	9.1
FY2034	−1.4	−1.4	9.7

Table 4-A: Fiscal Risk Assessment of Natural Disaster (with ND Fund and Improved Tax) Scenario (S4)

Fiscal Year	Federal Fiscal Balance Gap	Overall Fiscal Balance Gap	Total Debt of the Government Gap
FY2025	0.1	0.1	−0.1
FY2026	0.1	0.1	−0.2
FY2027	0.1	0.1	−0.3
FY2028	0.1	0.2	−0.4
FY2029	0.0	0.0	−0.4
FY2030	−2.2	−2.2	5.1
FY2031	−1.6	−1.6	6.3
FY2032	−1.5	−1.5	7.3
FY2033	−1.1	−1.1	7.7
FY2034	−1.1	−1.1	8.2

Table 5-A: Fiscal Risk Assessment: Federal Fiscal Balance (% of GDP)

Fiscal Year	Baseline	S1	S2	S3	S4
FY2023	-7.9	-7.9	-7.9	-7.9	-7.9
FY2024	-8.0	-8.0	-8.0	-8.0	-8.0
FY2025	-6.8	-7.3	-6.9	-6.9	-6.7
FY2026	-6.0	-6.4	-6.1	-6.1	-5.9
FY2027	-5.0	-5.3	-5.1	-5.1	-4.9
FY2028	-5.3	-5.5	-5.4	-5.4	-5.2
FY2029	-5.0	-5.3	-5.2	-5.3	-5.0
FY2030	-4.2	-4.5	**-6.6**	**-6.6**	**-6.4**
FY2031	-3.8	-3.7	-5.7	-5.7	-5.4
FY2032	-3.7	-3.6	-5.4	-5.4	-5.2
FY2033	-3.7	-3.5	-5.0	-5.0	-4.7
FY2034	**-3.6**	**-3.5**	**-5.1**	**-5.1**	**-4.8**

Table 6-A: Fiscal Risk Assessment: Overall Fiscal Balance (% of GDP)

Fiscal Year	Baseline	S1	S2	S3	S4
FY2023	-7.8	-7.8	-7.8	-7.8	-7.8
FY2024	-7.5	-7.5	-7.6	-7.6	-7.6
FY2025	-6.3	-6.7	-6.3	-6.3	-6.2
FY2026	-5.6	-6.0	-5.6	-5.7	-5.5
FY2027	-4.4	-4.7	-4.4	-4.4	-4.2
FY2028	-4.6	-4.8	-4.6	-4.6	-4.4
FY2029	-4.4	-4.7	-4.6	-4.6	-4.4
FY2030	-3.6	-3.8	-6.0	-6.0	-5.7
FY2031	-3.4	-3.2	-5.3	-5.3	-5.0
FY2032	-3.3	-3.0	-5.0	-5.0	-4.7
FY2033	-3.3	-3.1	-4.7	-4.7	-4.4
FY2034	-3.3	-3.1	-4.7	-4.7	-4.5

Table 7-A: Analysis of Total Debt of the Government (% of GDP)

Fiscal Year	Baseline	S1	S2	S3	S4
FY2023	74.8	74.8	74.8	74.8	74.8
FY2024	67.4	67.4	67.4	67.4	67.4
FY2025	65.2	65.7	65.2	65.3	65.2
FY2026	64.7	65.6	64.7	64.8	64.5
FY2027	63.4	64.7	63.4	63.6	63.1
FY2028	62.1	63.6	62.1	62.3	61.7
FY2029	60.4	62.2	60.6	60.9	60.1
FY2030	58.2	60.2	64.3	64.3	63.3
FY2031	55.9	57.5	63.3	63.2	62.1
FY2032	53.8	55.2	62.4	62.3	61.1
FY2033	52.2	53.3	61.4	61.3	59.9
FY2034	50.2	51.1	60.0	59.9	58.4