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Claiming Reparation for Loss and Damage Due to Floods 2022: The Case of Pakistan



Ali Rehmat, Dr Shafqat Munir Ahmad, Salman Danish,
Awais Umar, Ahmed Khaver, Ramsha Mehboob Khan

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Authors

Ali Rehmat, Dr Shafqat Munir Ahmad, Salman Danish,
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Table of Contents

1. Introduction	4
2. Methodology	7
3. Floods 2022	8
4. Loss and Damage	9
5. Community's Perspectives on loss and damage	11
6. Climate change-driven Loss and damage	13
6.1 Floods, rains, and strong dusty winds	13
6.2 Droughts	14
6.3 Agricultural Losses	14
6.4 Glacial Lake Outburst Floods	15
6.5 Heatwaves	15
6.6 Irrigation	16
6.7 Wildfires	16
7. A chronological overview of Loss and Damage debate under UNFCCC	17
8. Pakistan's Efforts in Combating Climate Change and Induced Disaster	20
9. Challenges in Acquiring Loss and Damage Fund	26
10. Conclusion	28
References	29

1. Introduction

Pakistan is the second largest country in South Asia covering an area of 881,913 km² (340,509 sq mi), with distinct and diverse topography, ecosystems, and climatic zones. According to the first-ever digital census of 2023, Pakistan’s total population is now 249.5 million. Province-wise, Punjab remains the most populous with a population exceeding 127.4 million followed by Sindh (57.9 million), Khyber Pakhtunkhwa (over 39.7 million), and Balochistan (over 21.9 million); Islamabad, the federal capital, registered a population of 2.3 million (Abbas, 2023).. The severe macroeconomic imbalances, flood damages, domestic supply shocks, and international economic slowdown have dampened the country’s economic growth to just 0.29% in FY2023. The GDP at current market prices recorded PKR 84,658 billion, showing a 27.10 % growth over the previous year of Rs 66,624 billion (US\$ 341 billion). In FY2023, the per capita income decreased from US\$ 1765 to US\$ 1568 (Ministry of Finance 2023).

Total population	249.5 million
Urbanization rate	2.70%
Population living in urban areas	36.40%
Population growth rate	2.40%
Youth Population (15-49 years old)	48% of the total population are youth
Afghan refugee population	1.29 million Afghan refugees are card holders
Gross Domestic Product (GDP)	22.9
Poverty rate	37.20%
Housing Deficit in Pakistan	(9 million Housing Units)
Human Development Index value	161.1
Access to Housing	(13 million in Urban, 20.01 million in Rural)
Population’s access to electricity	75.40%
Access to water	65.2 % population
Greenhouse Gas (GHG) Emissions	489.87 MtCOe

Source: The data has been collected from State of Pakistani Cities Report 2018, 2023- HAC Afghanistan Refugees, State Bank of Pakistan Report 2022, World Bank, UN-Habitat Country Report 2023, The State of Cities Report 2018, and Pakistan Nationally Determined Contributions (NDC) Report 2021.

Climate change, one of the most critical security issues, poses serious social, environmental, and developmental challenges. Though Pakistan contributes only 0.9% to global greenhouse gas (GHG) emissions, however, it is among the most vulnerable countries to the impact of climate change, which is evident from the changes in weather patterns, intense flooding, change in rainfall patterns, glacial lake outburst floodings (GLOF), and increase in the frequency and intensity of climate-induced natural disasters (NDC Report 2021). Pakistan ranks 8th among the top 10 most affected countries in the Global Climate Risk Index 2021 (Germanwatch 2021).

The graph below shows that Pakistan is the second highest in South Asia on the climate change risk index 2022. The level of risk indicates vulnerability of Pakistan to climatic hazards such as the devastating floods 2022 that incurred losses over \$30 billion losses and damages. This forced Pakistan to push its case for loss and damage to the world community with the support of the UN Secretary

General and G-77+ China at COP 27 in Sharm El Sheikh, Egypt in 2022. At the COP 28 held in Dubai (UAE) from November 30 to December 12, 2023, Pakistan along with G-77+ pushed its agenda for operationalization of the Loss and Damage Fund (L&D Fund), which was set up at COP 27.



(European Commission 2022b)

Aligned with the objectives outlined in the Paris Climate Agreement, the COP 28 was set to mark a historic moment by conducting the first-ever Global Stocktaking. This involves a comprehensive evaluation of the progress made by participating nations against their climate-related goals. The aim is to assess the collective efforts and achievements in addressing climate change on a global scale.

One of the major focuses of COP 28 was the leadership role assumed by the United Arab Emirates (UAE). The UAE is spearheading a collaborative process, encouraging all participating parties to reach a consensus on a clear roadmap. This roadmap is designed to expedite progress through a pragmatic global energy transition. Moreover, the approach emphasizes inclusivity with a commitment to a “leave no one behind” philosophy in the pursuit of effective climate action. This indicates a dedication to ensuring that the benefits and challenges of climate initiatives are distributed equitably, with a particular emphasis on the involvement of all stakeholders in the transition to a sustainable future.

COP 28 President, Dr. Sultan Al Jaber, marked a significant milestone by formally initiating the operationalization of a groundbreaking agreement during the conference. This agreement is focused on the establishment of a fund dedicated to assisting developing countries, particularly those most vulnerable to the adverse impacts of climate change, a category referred to as ‘loss and damage’ in negotiations. The foundation of this Fund was initially laid during COP27 in Sharm El Sheikh, Egypt, and today it transitions into an operational phase, following the consensus reached by participating parties in five transitional committee meetings.

The necessity of these transitional committee meetings became evident during the 4th meeting, where an impasse was encountered. In response, the COP28 Presidency introduced a crucial 5th transitional meeting, hosted earlier in Abu Dhabi, which proved instrumental in overcoming the challenges faced during the previous gathering. The outcome of this meeting was a resolution that generated

recommendations for the effective implementation of the Fund. Notably, these recommendations include the provision of essential grant-based support to countries significantly impacted by climate-related losses.

Underlining its commitment to addressing climate challenges, the UAE declared a substantial contribution of \$100 million to the Fund. This financial commitment aims to provide crucial assistance to countries facing extreme risks from the effects of climate change, supporting both mitigation efforts and recovery initiatives. The UAE's contribution stands alongside noteworthy commitments from other nations, demonstrating a collective global effort (UNCC, 2023).

In response to the initial commitments reaching approximately US\$420 million made on the opening day of COP28 to support the Loss and Damage Fund, there is a collective acknowledgment and response to the urgent need for financial assistance. The Loss and Damage Fund is specifically designed to aid communities in developing countries that bear the brunt of disastrous weather events and other adverse impacts resulting from global warming.

The significance of the pledges, totaling \$420 million, underscores the international community's recognition of the severity of the challenges faced by vulnerable communities in the developing world. These financial commitments represent a crucial step towards addressing the consequences of climate change, particularly for those who are disproportionately affected by its impacts.

As nations come together to make these initial pledges during COP 28, there is a shared understanding of the importance of supporting communities that are grappling with the tangible and often devastating effects of climate change. The pledged funds are intended to contribute to the Loss and Damage Fund, providing essential resources to mitigate, recover from, and adapt to the aftermath of disastrous weather events and other harms exacerbated by global warming (International Institute for Sustainable Development 2023).

Among these commitments, Germany pledged \$100 million, while the UK made a significant contribution of £40 million for the Fund and an additional £20 million for other related arrangements. Japan demonstrated its commitment with a contribution of \$10 million, and the United States pledged \$17.5 million, underlining a collaborative effort by diverse nations to address the urgent challenges posed by climate change. These financial commitments not only underscore the international community's recognition of the severity of climate-related issues but also highlight a concerted effort to alleviate the impacts on the most vulnerable nations (United Nations Climate Change [UNCC] 2023).

The US proposed the World Bank as the host for the Loss and Damage (L&D) fund, a move strongly opposed by developing nations. Their concerns revolved around the World Bank's high costs, weak climate change track record, and the potential for US ideological influence in its decisions. Experts also highlighted issues with the World Bank's accountability compared to an independent international body dedicated solely to managing a loss and damage fund.

Despite reservations, a temporary compromise was achieved, allowing the World Bank to host the fund for the initial four years. However, there are assurances that it will eventually transition to an independent entity, addressing some of the concerns raised by developing nations and experts (Haq, 2023).

The damages Pakistan had faced due to the floods in 2022 stand at US\$14.9 billion while the losses stand at US\$15.2 billion (Ministry of Planning Development & Special Initiatives 2022). The event triggered an immense \$16.3 billion reconstruction bill and raised the question if Pakistan's recovery could incorporate more climate resilience, given its significant financial constraints (Euwmiel Marc Havstrup 2023). Amid the loss and damage caused by the 2022 floods and the current economic crisis, it is hardly possible for Pakistan to recover without international financial assistance. Though Pakistan is in dire need of accessing climate finance from both international and domestic sources, reparation for the loss and damage due to climatic hazards is another avenue to seek climate justice. This study discusses the loss and damage Pakistan incurred during the 2022 floods, national efforts in mitigating climate change and climate-induced disasters, the Loss and Damage Fund, constraints for Pakistan in securing international support and suggests enhancing ways to secure loss and damage fund by enhancing governance and transparency in the country.

2. Methodology

The study employs information from both the primary and secondary sources. Primary sources include government officials at the Ministry of Climate Change (MoCC), National Rural Support Programme (NRSP), Catholic Relief Pakistan, Environmental Protection Agency (Pak-EPA) and leading voices from NGOs, especially Indus Consortium and SPO being the ones grounded in communities, who had faced the floods 2022, INGOs, academia and climate change activists. These stakeholders were identified in a stakeholder mapping exercise conducted prior to this paper based on relevance, influence, and role in accessing climate finance.

With the support of Indus Consortium and SPO teams on ground, the primary data from communities was gathered in Muzaffargarh in the Punjab, Wagan and Warah flood communities from Sindh and some districts of Balochistan. Key informants were interviewed and inquired about the impact of 2022 floods, relief, rehabilitation and resettlement process and the need for financial support. Total FGD conducted in the Punjab are: 4 (2 with men and 2 with women). Total FGDs conducted in Sindh province are 8 (4 with women, 2 including both men and women and 2 with men). Total FGDs conducted in Balochistan are 6 (4 with women and 2 with men). Total FGDs conducted for the study are 18.

Separate semi-structured questionnaires (for government officials, academia, and community) were employed for primary respondents. The questionnaires were based on literature review of recent government plans and programmes around accessing climate finance. Secondary sources include reports from development partners and government ministries, interviews, newspaper articles, United Nations documents, and journal articles. The policy position paper is based on qualitative data and is descriptive in nature.

3. Floods 2022

In 2022, Pakistan experienced one of the most severe floods in history, causing substantial loss and damage to the country’s infrastructure, economy, and livelihoods. The country received 243% more rainfall than usual and the month of August was recorded as the wettest August since records began in 1961 (Pakistan Meteorological Department [PMD] 2022a). The precipitation remained above normal in Sindh (726%), Balochistan (590%), Gilgit-Baltistan (233%), Khyber Pakhtunkhwa (58%) and Punjab (52%). In Azad Jammu and Kashmir, the rainfall recorded below normal, i.e. (-3%) (PMD 2022b)

August, 2022 Area-Weighted Rainfall					
	Rank (of 62)	Normal (mm)	Average (mm)	Departure (per cent)	Ranking
Pakistan	62	56.2	192.7	243	1st highest (previous record 116.7 mm in 2020)
Punjab	53	93.3	141.7	52	10th highest (record 282.6 mm in 1973)
Sindh	62	53.6	442.8	726	1st highest (previous record 247.9 mm in 2020)
Khyber Pakhtunkhwa	59	103.6	163.9	58	4th highest (record 225.4 mm in 2010)
Balochistan	62	22.4	154.9	590	1st highest (previous record 83.3 mm in 2020)
Azad Jammu & Kashmir	34	156.7	146.1	-3	29th highest (record 308.2 mm in 1997)
Gilgit-Baltistan	61	16.7	55.7	233	2nd highest (record 89.1 mm in 1997)

[PMD, 2022b] - [Rank ranges from 1 (Lowest) To 62 (Highest)]

The floods submerged one-third of the country’s land under water, displaced around eight million people, and affected 33 million people. Sindh was the worst affected province with close to 70% of total damages and losses, followed by Balochistan, Khyber Pakhtunkhwa, and Punjab (World Bank 2022).

The flood damage is estimated at Rs 3.2 trillion (US\$14.9 billion), the loss to GDP at Rs 3.3 trillion (US\$15.2 billion), and the recorded need for rehabilitation of damages at Rs 3.5 trillion (US\$16.3 billion), which is projected as much as 1.6 times the budgeted national development expenditure for the fiscal year 2023 (Ministry of Finance 2023). Housing, Agriculture & Livestock, and Transport and Communication sectors suffered heavy losses at US\$ 5.6 billion, US\$ 3.7 billion, and US\$ 3.3 billion respectively. It is estimated that the total damage is equivalent to 4.8% of FY22 gross GDP (Post Disaster Need Assessment 2022).

Sector	Damage		Loss		Need	
	PRs. Billion	\$ (Million)	PRs. Billion	\$ (Million)	PRs. Billion	\$ (Million)
Punjab	111	515	122	566	160	746
Khyber Pakhtunkhwa	201	935	141	658	168	780
Balochistan	349	1625	541	2516	491	2286
Sindh	1948	9068	2444	11376	1688	7860
Cross-Provincial	587	2731	14	67	975	4540
Special Regions	7	32	11	49	10	48
Total	3202	14906	3272	15232	3493	16261

(PDNA, 2022)

The PDNA Report 2022 suggests that 8.4 million to 9.1 million people will be pushed into poverty as a direct consequence of the floods. Similarly, multidimensional poverty will increase by 5.9% points, pushing an additional 1.9 million households into nonmonetary poverty (PDNA, 2022). The World Bank's Poverty & Equity Brief of April 2023 shows that poverty is expected to reach 37.2 % [\$3.65 /day 2017ppp], which was 39.8% in 2018 (World Bank 2023), a slight decline.

The flood has damaged more than 2 million houses, 23,900 schools, and 13,000 km of road. The number of displaced people are estimated to 7.9 million, including 598,000 people living in relief camps (OCHA, 2022). The internally displaced people have started returning to their areas but in a very challenging situation. The report of the Centre for Disaster Philanthropy shows that as of March 2023, approximately 1.8 million people were still living near stagnant and contaminated floodwater (Centre for Disaster Philanthropy (CDP), 2023). In November 2022, the World Health Organization (WHO) reported that around 8 million flood-affected people need health assistance, approximately 7.9 million people may be temporarily displaced, and a total of 20.6 million people, including 650,000 flood-affected refugees and host communities, require humanitarian assistance (Overview, 2022).

4. Loss and Damage

Loss and damage in the context of climate change refer to the negative effects or harm caused by the impacts of climate-induced extreme weather events, such as floods, drought, glacial lake outburst flood (GLOF), etc. Losses and damages can result from both sudden-onset events (e.g. flooding, cyclones, and heatwaves) and slow-onset events (e.g. increasing temperature, desertification, and sea-level rise) (Liselotte Jensen, 2022). These effects can include both tangible and intangible losses that result from the inability to adapt to or mitigate the impacts of climate change adequately. Loss and damage can occur when climate impacts surpass the ability of communities, countries, or systems to cope, resulting in lasting and often irreversible consequences. Loss and damage are usually estimated in terms of total economic impact which consists of direct economic loss and indirect economic loss, and non-economic loss and damage.

Economic Losses

Economic Losses refer to the tangible and quantifiable costs associated with the impacts of climate change. These can include direct damage to infrastructure, property, and assets as well as indirect costs related to disruptions in economic activities, reduced productivity, and increased recovery and reconstruction expenses. The economic losses include direct and indirect economic losses. Direct economic losses usually happen during the event or within the first few hours after the event and are often assessed soon after the event to estimate recovery cost and claim insurance payments. These are tangible and relatively easy to measure. Indirect economic loss includes microeconomic impacts (e.g. revenue declines owing to business interruption), and macroeconomic impacts (e.g. price increases, increase in government debt, negative impact on stock market prices and decline in GDP). Indirect losses can occur inside or outside the hazard area and often have a time lag.

Non-Economic Losses and Damage

Non-economic losses and damages encompass 'difficult to quantify intangible' impacts. These can include the loss of human lives, social dislocation, cultural heritage, health impacts, indigenous knowledge, and social dislocation due to climate-induced events. Such losses are often challenging to monetize but are critical for understanding the comprehensive impacts of climate change (UNDRR, 2022).

Within these categories, different types of losses and damage can arise from the effects of climate change. Physical losses entail direct harm to critical elements such as infrastructure, housing, agriculture, and ecosystems, often stemming from extreme weather events such as storms, floods, and droughts. Simultaneously, the degradation or destruction of ecosystems leads to the loss of essential services such as water purification, soil fertility maintenance, and climate regulation. The impacts extend to livelihoods, disrupting income-generating activities and disproportionately affecting vulnerable communities dependent on subsistence farming or informal economies. Health consequences manifest as changing climate patterns contribute to increased disease prevalence, spanning temperature-related ailments, waterborne diseases, and vector-borne illnesses. Moreover, the erosion of cultural practices, traditional knowledge, and heritage is notable, particularly impacting indigenous and local communities. Additionally, climate-induced phenomena such as rising sea levels, land degradation, and extreme weather events forcibly displace communities, giving rise to migration and displacement. Collectively, these forms of loss and damage underscore the intricate and far-reaching implications of climate change across societal and environmental domains.

5. Community's Perspectives on loss and damage

To get the community's perspectives on loss and damage, a series of Focus Group Discussions (FGDs) were conducted. The FGD in Muzaffargarh comprehended the experiences and insights of the community on climate-induced disasters, particularly floods. The Muzaffargarh community had already been exposed to two major floods during the period between 2000 and 2014 before the floods 2022. During the discussions, the community stated that the 2010 flood stands out as the most terrible and devastating event during this period in which the area was devastated to a larger extent. The floods of 2010 and 2014 caused widespread displacements, loss of homes, and disruption of livelihoods. Livestock, crops, and property were also severely damaged. The inundation of farmlands led to a decline in agricultural productivity, impacting the community's main source of income. The floods strained the existing socio-economic vulnerabilities of the community, exacerbating poverty and inequality.

During the focus group discussions (FGDs) in Muzaffargarh district, it was learnt that inadequacies exist in the availability of information on disaster response and effective and efficient alert systems. There were no formal early warning systems in place to alert residents about impending disasters.

In 2022, some residents received SMS

alerts from the district government, but the effectiveness of this practice was limited due to the high rate of illiteracy in the area. The community had not received any training in Community-Based Disaster Risk Reduction (CBDRR). While there was a single instance of Punjab Rescue team delivering a session on first aid, there was a lack of comprehensive CBDRR training that could have equipped the community with essential skills and knowledge for disaster preparedness and response.

FGD was conducted in Goth Sardar Khan, Sohbatpur district, Balochistan where the

communities have endured a range of There were loss of homes, damage to crops, and an impact on access to essential resources such as drinking water and food.

Before the flood, the village had been enduring incessant rainfall with a stretch of loss and damage after the 2022 floods.

A relentless downpour continued for 8 to 9 days that brought both widespread damages. The roofs of homes, unable to withstand the deluge, began to leak profusely, leaving the villagers with a disheartening challenge of finding dry spots to sleep, cook, and carry out daily routines. The very places that once offered comfort and protection turned into areas of discomfort and vulnerability.

As the floodwaters surged, the scene took on an even more daunting aspect. The community faced the urgent task of rescuing their essential belongings from the advancing waters. However, this endeavour proved to be a formidable undertaking. Negotiating through the rising tides, the villagers had to carefully gather their vital possessions and navigate through the submerged landscape. The familiar pathways were obscured by the flood, making the process of relocating their necessities to higher ground a race against time and nature's unrelenting force.

In the aftermath of flood, the community is left with the memories of challenging moments, a vivid reminder of the raw power, and unpredictability of natural disasters. The resilience and unity displayed during this crisis serve as a testament to the indomitable spirit that binds the villagers together in the face of adversity.

Source: FGD conducted in Goth Sardar Khan, Sohbatpur district by Ms Kalsoom, Ms Shabana, and Mr Arshad Ali on 16 August 2023.

Key Informant Interviews were conducted with Catholic Relief Pakistan, National Disaster Management Authority (NDMA), (Provincial Disaster Management Authority (PDMAs), National Rural Support Programme (NRSP), Ministry of Climate Change (MoCC), and Pakistan Meteorological Department (PMD). The outcome of the interviews shows that the current information regime is very fluid. A lot of information is being collected by different stakeholders such as Sector Working Group, Pakistan Humanitarian Forum (PHF), United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA), the government, and others on the program design, implementation, progress, plans, assessments, funding, etc. but lacks a centralized system to manage and disseminate information. There is hardly any centralized information management system and poor or no referral mechanisms established yet even for the protection and safeguarding issues related to beneficiaries.

An integrated information management system needs to be in place so that the affected population might get the right and timely information about the assistance they will receive and their entitlements. These systems can provide information about the government plans in connection with agriculture assistance, health, education, shelter/housing, etc.

To ensure the equality of access to international funding, NGOs need to have in place and practice a strong financial management system, capacity to design strong and competitive project proposals, implementation methodology, and strong accountability system. They should also have the capacity to ensure compliance to the donor's regulations. The organizations also need to demonstrate technical capacity and implementation protocol in place and ensure capacity for project design and monitoring, evaluation, and learning (MEAL).

During the interviews, respondents from Wagan in Sindh, said that the people staying in the tent city of Wagan belong to Sabu Burro, Hamal Lake area of Tehsil Qamber. Their village was inundated after the lake bund (embankment) broke due to heavy rains. They were rescued by the army that provided them with tents and ration, and the Sindh Rural Support Organization (SRSO) erected restrooms for them. In the first 40 days, about 400 people in Wagan, and every third person contracted some illness. Most of the adults and children contracted malaria; though a medical van used to visit the area, there was no regular cure for the patients. The community also lacked resources; the village was inundated, and it would be challenging to travel there even in the coming months; the winter is just approaching, but there seem to be no preparations for it. The local administration, including assistant commissioners and deputy commissioner, need to be available during the disasters for redressal of their grievances.

During the key informant interview, a senior journalist in Warah, Sindh, said that more than 200 people died due to outbreak of different diseases. Though medical aid was being provided, diseases such as malaria, high fever, and skin allergy were spreading very fast. Only in one camp, 100 people were tested for malaria, and 70 of them were detected positive. Farmers in Warah had done their cultivation work, which was destroyed due to heavy rains; in addition, the village settlements had been destroyed. Moreover, no livelihood sources were available in this area.

6. Climate change-driven Loss and damage

Studies show that in the past 20 years, Pakistan faced around 150 climate induced disasters such as floods, droughts, GLOF, agriculture losses, heatwaves, irrigation losses, etc. Almost 10% of the population was displaced in two provinces, one in the North and another in the South (Mushahid Hussain, 2019).

6.1 Floods, rains, and strong dusty winds

In 2010, Pakistan experienced a profoundly tragic period, which was characterized by incessant rainfall over three days in the northern region. This caused a significant increase in the volume of the Indus River and formed an extensive body of water that moved southwards from the Himalayas to the Arabian Sea. The repercussions of this event had an immediate and disastrous impact on the poor population and infrastructure. Among a total population of 168 million, approximately 20 million individuals were adversely affected by the violent floodwaters, resulting in larger displacements. This impact was predominantly seen in the provinces of Khyber Pakhtunkhwa, Punjab, and Sindh.

The flooding submerged more than 2.4 million hectares of cultivated land and damaged the standing crops. Additionally, the loss of around 450,000 livestock further aggravated the livelihood situation, impacting the country's agricultural productivity and food supply. This disaster had more devastating impact on agriculture sector (Pakistan Humanitarian Forum, 2011).

In the year 2022, Pakistan faced an exceptionally severe flooding event. This disaster resulted in significant detrimental effects on the nation's infrastructure, economic condition, and the means of sustenance for its population. The region witnessed an extraordinary increase in rainfall, measuring 243% higher than the typical levels. Moreover, historical records dating back to 1961 revealed that the month of August in that year registered the highest amount of rainfall ever documented. The floods submerged one-third of the country leading to the displacement of roughly eight million individuals and impacting a total of 33 million people. Among the provinces, Sindh bore the brunt of devastation, accounting for nearly 70% of the overall damages and losses. This was followed by Balochistan, Khyber Pakhtunkhwa, and Punjab in terms of the extent of the impact (World Bank, 2022).

The flood damage is estimated at PKR 3.2 trillion (US\$14.9 billion), the losses to GDP at PKR 3.3 trillion (US\$15.2 billion), and recorded the need for rehabilitation is at PKR 3.5 trillion (US\$16.3 billion) which is projected as much as 1.6 times the budgeted national development expenditure for the fiscal year 2023 (Ministry of Finance, 2023). Housing, agriculture and livestock, transport and communication sectors suffered the most significant damage at US\$ 5.6 billion, US\$ 3.7 billion, and US\$ 3.3 billion, respectively. It is estimated that the total damage is equivalent to 4.8% of FY22 gross Gross Domestic Product (GDP) (PDNA, 2022).

In June 2023, Cyclone Biparjoy brought strong winds and heavy rains, resulting in four fatalities, five injuries, 2,460 partially damaged and 190 fully damaged homes in Sindh province (World Food Programme, 2022).

On June 10, 2023, heavy rains in Khyber Pakhtunkhwa and the Punjab claimed the lives of 31 individuals, and 160 people were injured. The districts of Dera Ismail Khan, Karak, Bannu, and Lakki Marwat reported 28 fatalities, damage to three schools, and over 160 houses. More than 150 cattle perished, and three girls lost their lives in Chan village of Khushab district. At least 10 people were injured in rain-related incidents in Gujranwala. The heavy rain and dusty winds caused power outages in various areas of Punjab and Khyber Pakhtunkhwa (OCHA, 2023).

6.2 Droughts

Drought, be it meteorological, hydrological, or agricultural, has the highest impact among all natural calamities. Pakistan is among the top 23 countries facing the issue of drought emergency. People are experiencing water scarcity and rivers are drying up due to prolonged heatwaves, changes in the precipitation, and poor distribution of water. In addition, Pakistan's per capita water availability has dropped from 5,060 cubic meters per annum in 1951 to only 908 cubic meters now. Indus River Delta has shrunk by a massive 92% from 13,000 square kilometers in 1833 to only 1,000 sq kms. Several districts in the provinces of Balochistan and Sindh experienced drought conditions which caused food insecurity.

The 2018 drought in Balochistan resulted in crop losses of up to 80 per cent, leading to a widespread food insecurity and migration. Similarly, the 2021 drought in Sindh affected over five million people and caused losses of over PKR 100 billion due to flash floods, which caused significant damage to infrastructure and homes. In 2021, Balochistan faced severe drought conditions. Nearly all farming households had reductions in crop production due to multiple shocks compared to a normal year, affecting both staples, fodder crops, cash crops, and others. In an aggregate perspective, significant proportions of crop growers were affected, with 89% of wheat cultivators, 71% of sugarcane cultivators, 99% of cotton cultivators, 89% of maize cultivators, 100% of rice cultivators, 100% of millet cultivators, 92% of sorghum cultivators, 94% of cluster beans cultivators, 93% of pulses cultivators, and 97% of vegetable cultivators reporting decreased production in comparison to a standard year. This reduction in production was also reflected in Rabi season fodder crops, affecting 82% of growers, and in Kharif season fodder crops, affecting 56% of cultivators (Integrated Food Security Phase Classification (IPC, 2021)malnutrition and poverty in Pakistan. In 2020, the population faced multiple shocks including high food prices, locust outbreaks, rains/flooding and snowfall, all exacerbated by the impacts of the COVID-19 pandemic. Around 0.76 million people (27% of the rural population analysed).

6.3 Agricultural Losses

In Pakistan, crops like rice, vegetables, spices, and some grains are particularly climate sensitive. In 2022, Pakistan ranked 99th out of 121 countries (Global Hunger Index 2022). The climate-induced

disasters, the supply chain disruptions after Russia-Ukraine conflict are also likely to further aggravate the crisis. Pakistan faced a heavy monsoon spell in July-August 2022 that caused damage to two main sub-sectors, i.e. crops and livestock which had a spillover effect on the industry and allied services sectors. The estimated damage in the agriculture sector was approximately PKR 800 billion (US\$ 3.725 billion). As a result, domestic production remained below the required levels causing a historic hike in the prices of all the necessary food items. (Ministry of Finance 2023).

6.4 Glacial Lake Outburst Floods

Glacial Lake Outburst Floods (GLOFs) are abrupt events that can release millions of cubic meters of water and debris, incurring loss of lives, property, and livelihoods in the vulnerable regions.

Pakistan is home to some of the largest and longest mid-latitude glaciers in the world, covering an extensive area of 15,000km² in the northern regions. The Karakoram-Pamir region is heavily glaciated, with over 5,000 glaciers covering more than 37% of the Karakoram ranges. Over the past 200 years, the region has witnessed 35 hazardous floods recorded in the Karakoram area, 20 in the Himalayas, and 17 in the Upper Indus. The presence of more than 3,044 glacial lakes in Gilgit-Baltistan and Khyber Pakhtunkhwa and over 36 of these glacial lakes possess the potential of GLOF risks (Ashraf, Naz and Roohi 2012). Approximately 30 GLOF incidents have been documented along the Karakoram Highway (KKH) during the past 20 years. These incidents serve as significant indications of climate change.

Several remote regions such as Shimshal valley, Passu in Gojal Hunza, Hassanabad Hunza, Shyok stream bowl in the Eastern Karakoram, and Chitral Valley in the Hindu-Kush, have been known for experiencing GLOF disasters over the last two decades. There is a pressing need to integrate comprehensive GLOF mitigation and adaptation strategies into the National Climate Change Policy Framework to ensure a more proactive approach in dealing with the potential risks posed by GLOFs.

6.5 Heatwaves

In recent years, Pakistan faced extremely high temperatures, which are considered highest in the world. The country has witnessed a notable increase in heat exposure and a rise in the frequency of heatwaves, which are attributed to the impact of climate change. A substantial increase has been predicted in the number of days per year with a heat index exceeding 35°C by the end of the 21st century. During May to October, Jacobabad becomes one of the hottest places on the earth. In June 2021, the city recorded its highest temperature of 52°C and in May 2022, the temperature in Jacobabad raised to 51°C. Lahore witnessed 45°C in May 2022, that is just a few degrees short of its historical record of 48°C from 2007. (Amnesty International 2023). Heatwave in 2015 in Karachi caused over 1200 deaths (Asian Development Bank, 2017). Heatwaves' frequency is continuing unabated with its impact on the lives and livelihoods of the people and other species on the earth.

6.6 Irrigation

The Karakoram-Hindukush-Himalaya (KHH) mountain range, having the planet's largest glaciers, accommodates the most extensive interconnected irrigation system globally. This system derives over 65% of its freshwater from this region. Pakistan possesses a remarkable count of more than 7,000 glaciers, a noteworthy tally among nations (Adhem 2023).

By the year 2018, the process of glacier melting had led to the creation of over 3,000 lakes in Gilgit-Baltistan and Khyber Pakhtunkhwa provinces. Among these lakes, 33 are identified as being susceptible to potential flooding risks. This situation poses a grave risk to over seven million individuals residing in areas downstream from these regions. Changes in the climate patterns indicate a decline and postponement in the melting of glaciers, accompanied by an augmentation and earlier onset of snowmelt. These alterations result in a decrease in the total water accessibility and substantial shifts in the seasonal patterns of the water flow system. There is a lack of existing knowledge regarding the complex hydrological regime of the Upper Indus Basin, limiting current capacity to estimate future water availability (International Institute for Sustainable Development [IISD] 2017).

6.7 Wildfires

Forests cover just 4.8% of Pakistan, and fire is the biggest driver of forest loss in the country: Global Forest Watch estimates that between 2001 and 2021, Pakistan lost 5,460 hectares of tree cover due to fires and 4,290 hectares from all other drivers (UNDRR, 2022). In 2010, Pakistan had 648kha of tree cover, extending over 0.74% of its land area. In 2022, it lost 48.6ha of tree cover, equivalent to 19.3kt of CO₂ emissions (Global Forest Watch, 2023). In Balochistan, 1,542 hectares of chilgoza forest was burnt in the Sulaiman Mountains, one of the world's largest forest location (UNDRR, 2022).

In July 2022, about 17,095 acres, including trees on 488 hectares planted under the billion-tree tsunami project in the Hazara region. More than 454 incidents of forest fires were reported in Khyber-Pakhtunkhwa this year, out of which 283 fire incidents were confirmed by the KP Department of Forests, Environment and Wildlife (Hayat, 2022)..

7. A chronological overview of Loss and Damage debate under UNFCCC

The human and ecosystem vulnerability to climate change and climate-induced disasters has generated the debate on the effectiveness and efficiency of national and international responses to mitigation and adaptation of climate change (García 2020). Loss and damage encompass the adverse outcomes resulting from the inevitable risks of climate change, including rising sea levels, prolonged heatwaves, desertification, ocean acidification, and extreme events such as bushfires, species extinction, and crop failures. In the context of climate negotiations, the topic of Loss and Damage has been a subject of complex discussions under United Nations Framework Convention on Climate Change (UNFCCC), largely due to varying viewpoints concerning liability, financial responsibility, and the level of assistance required for vulnerable nations. Developing countries have consistently stressed the importance of receiving sufficient and dependable financial support from developed nations to effectively tackle Loss and Damage challenges.

In the global climate change regime, the idea to address loss and damage resulting from climate change emerged during drafting of the United Nations Framework Convention on Climate Change (UNFCCC) in 1991. However, the debate on loss and damage theme in the UNFCCC climate negotiations has been contentious one for over three decades. During the negotiation for a Framework on Climate Change in December 1991, the parties recognized to establish an international climate fund to finance measures to counter the adverse impacts of climate change. They also recognized to form a separate International Insurance Pool to provide financial insurance against the consequences of rise in the sea levels where the financial sources for the Insurance Pool will be drawn from the developed and industrialized countries.

The parties also agreed that the financial burden of loss and damage suffered by small island and low-lying developing countries as a result of sea level rise shall be distributed in an equitable manner amongst the industrialized developed countries by means of an Insurance Pool (UNFCCC, 1991). The proposal suggested that the developed industrialized countries would contribute funds based on their share of the global gross national product related contribution and global emissions. However, the proposal was rejected, and the issue of loss and damage was not mentioned when the text of the Framework Convention was adopted in 1992 (World Resource Institute [WRI], 2022).

In 2007, loss and damage first appeared in the negotiated outcome of the UN climate talks (COP13) during the Bali Action Plan (UNFCCC, 2007). In 2013, the parties formed the Warsaw International Mechanism on Loss and Damage during the UN climate negotiations (COP19) to facilitate, mobilize and secure expertise and enhance support to strengthen the approaches and facilitate the development and implementation approaches to address loss and damage associated with climate change. However, neither the Warsaw International Mechanism nor any other established instruments provide financing to help developing countries to manage loss and damage.

On December 12, 2015, the Paris Agreement was adopted by 196 Parties at the UN Climate Change Conference (COP21) in France. The Agreement aims to strengthen global efforts to face the threat of climate change by holding the increase in the global average temperature below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. In Article 8 of Paris Agreement the parties recognized the importance of prevention, minimizing and addressing the climate induced loss and damage including extreme weather events and slow onset events, and the role of sustainable development in mitigating the risk of loss and damage.

In Article 8 of the Paris Agreement, the parties agreed on cooperation and facilitation to enhance understanding, action, and support a) Early warning systems; (b) Emergency preparedness; (c) Slow onset events; (d) Events that may involve irreversible and permanent loss and damage; (e) Comprehensive risk assessment and management; (f) Risk insurance facilities, climate risk pooling and other insurance solutions; (g) Non-economic losses; and (h) Resilience of communities, livelihoods and ecosystems. However, Article 8 faced limitations since the Agreement doesn't refer to finance related to loss and damage (UNFCCC, 2015). Certainly, developed nations ensured that the accompanying COP decision contained explicit language stating that loss and damage "shall not entail or establish any liability or compensation."

At the 2009 Copenhagen climate talks (COP15), rich countries committed \$100 billion a year by 2020 to help the developing and vulnerable countries for climate action. The pledge has not yet been materialized.

In 2021, during COP26 at Glasgow, the climate-vulnerable countries advocated for creating a new finance fund facility for loss and damage. The plea was born out of the frustration over the world's continuous and inadequate response to the climate crisis. However, once again, the developed nations once again rejected the proposal.

A group of over 50 developing countries jointly proposed the establishment of the Glasgow Facility for Financing Loss and Damage known as the Climate Vulnerable Forum, for a Glasgow Climate Emergency Agreement. However, after two weeks of intensive negotiations, a group of industrialized countries, led by the United States and the COP26 Presidency, demoted the demand for the creation of the Glasgow Facility for Financing Loss and Damage. The summit remained unsuccessful in creating any new funding for loss and damage (Saleemul Huq, 2022). The positive outcome of COP26 was the creation of the Santiago Network on Loss and Damage, though it is a technical body without the ability to address the reality of loss and damage on the ground.

Finally, Pakistan has been instrumental in getting the Loss and Damage Fund established at the COP27 at Sharm El Sheikh, Egypt in 2022 in the aftermath of the devastating floods 2022 in the country. Pakistan, as the Chair of the G-77+China and with the support of the UN Secretary who himself visited Pakistan to look at the destruction caused by climate-induced floods, launched a hectic diplomatic

struggle at the international negotiations and convinced the world leaders to set up the much-awaited Loss and Damage Fund. The then Prime Minister of Pakistan, Foreign Minister of Pakistan, and Federal Minister for Climate Change along with other top officials and experts influenced the global community at COP27 negotiations to support the formation of the fund. The Parties agreeing to Pakistan and G-77+China approved setting up of the Loss and Damage Fund. The Parties also recognized the existing channels and initiatives, including those outside the UNFCCC and Paris Agreement, that are part of the mosaic of solutions to address loss and damage. Countries also developed consensus and resolved the key questions around the Santiago Network on Loss and Damage (SNLD)'s governance and its operationalization at COP28 in December 2023.

In 2023, COP28 took place in the UAE at Expo City Dubai from November 30 to December 12, drawing over 52,000 party delegates and 90,000 non-party attendees (Butt, 2023). The UAE played a pivotal leadership role, facilitating consensus on a roadmap for a pragmatic global energy transition with an inclusive "leave no one behind" philosophy.

COP28 President, Dr. Sultan Al Jaber, initiated a groundbreaking agreement focused on establishing a fund to assist developing countries, particularly vulnerable to climate change's adverse impacts ('loss and damage'). This transitioned into an operational phase after consensus in five transitional committee meetings.

On the opening day, COP 28 garnered commitments totaling approximately US\$420 million for the Loss and Damage Fund. Noteworthy contributions include Germany's \$100 million, the UK's £40 million for the Fund and £20 million for related arrangements, Japan's \$10 million, and the US's \$17.5 million, emphasizing a collaborative global effort (UNCC 2023). The UAE declared a substantial \$100 million contribution, aligning with other nations to address climate challenges (UNCC, 2023).

Despite opposition, the US proposed the World Bank to host the Loss and Damage Fund, citing concerns about costs, the bank's climate change track record, and potential ideological influence. A temporary compromise was reached, allowing the World Bank to host for four years with assurances of eventual independence (Haq, 2023).

8. Pakistan's Efforts in Combating Climate Change and Induced Disaster

The Government of Pakistan led the humanitarian response in the flood 2022 affected areas, supported by the humanitarian partners. The government also established 'Prime Minister's Flood Relief Fund 2022 for immediate help with food, shelter, and medicines as well as rehabilitation efforts. The Fund accepted donations both from domestic and international sources. In September 2022, the Federal Government increased the amount of Flood Relief Cash Assistance Package from PKR 28 billion to PKR 70 billion for the flood affected families. Benazir Income Support Programme also disbursed PKR 35 billion among 1,400,896 flood affected families in 2022 (BISP, 2022).

On January 9, 2023, the government of Pakistan and the UN co-hosted an International Conference on Climate Resilient Pakistan in Geneva. The donors made additional financial commitments to support flood recovery, totaling \$8.57 billion (CDP, 2023). The government is also providing PKR 1 million (US\$4,615) in ex-gratia compensation to the next of kin of the people died due to the floods; PKR 250,000 (US\$1,154) for injuries and for partially damage houses; and PKR 500,000 (US\$2,308) for destroyed houses (OCHA, 2022). The Government of Pakistan released PKR 5 billion (ca. US\$23 million) to NDMA for relief operation. The National Disaster Management Authority (NDMA) and Provincial Disaster Management Authorities (PDMA) are also supporting people in need with in-kind support in the affected provinces. As of May 2023, the government and humanitarian partners have provided life-saving assistance to over 7.71 million people in flood-affected areas (OCHA, 2023).

Pakistan's Disaster Management and Climate Action Architecture

Since 2005 earthquake, Pakistan has developed its disaster management architecture as per globally recommended standards and now the country is pro-actively moving towards structured and technology-supported humanitarian and climate action through institutionalization of its policies and frameworks to reach the goal of a well-coordinated response during emergencies and to undertake DRR and climate change adaptation (CCA) measures to prepare communities to be resilient thus protecting lives and livelihoods of millions of its people at risk of climatic hazards. Pakistan enacted the Climate Change Act in 2017 which provides comprehensive adaptation and mitigation policies, plans, programs, and projects required for climate-induced disasters in Pakistan (Government of Pakistan, 2017).

National Disaster Management Ordinance (NDMO 2006)

Pakistan through a National Disaster Management Ordinance (NDMO 2006) constituted an institutional setup for disaster risk management in 2006. The National Disaster Management Authority (NDMA) was established at the National level, Provincial Disaster Management Authority at the Provincial level, and District Disaster Management Authority (DDMA) at the Local level (Government of Pakistan, 2009). In 2012, the National Disaster Management Authority (NDMA) launched the National Disaster

Management Plan (NDMP) 2012-2022. The National Disaster Management Plan (NDMP) was prepared to enhance the capacity of the country to prepare for and respond to natural and climate-induced disasters (MoCC, 2012).

National Disaster Risk Reduction Policy 2013

The National Disaster Management Authority (NDMA) formulated the National Disaster Risk Reduction Policy through wider consultations with all stakeholders, including all provinces, state of AJ&K and regions. The policy was approved by the National Disaster Management Commission on 21st February 2013, headed by the Prime Minister of Pakistan. This policy emphasizes risk assessment, prevention, mitigation, preparedness and promotes priority measures to ameliorate existing vulnerabilities to hazards. It also provides guideline for timely, dedicated, and adequate investment on hazard mitigation and preparedness interventions which will substantially reduce the disaster risk and consequential damages and economic cost associated with response, recovery and rehabilitation (MoCC and NDMA, 2013).

Pakistan's Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF)

In 2022, the Government of Pakistan prepared the Resilient Recovery, Rehabilitation, and Reconstruction Framework (4RF). The policy follows a globally recognized approach and methodology for recovery strategy development. The policy and strategic document guide the recovery, rehabilitation, and reconstruction of disaster hit areas in the country. The framework draws from the findings of the Post Disaster Needs Assessment (PDNA) 2022 and presents sequenced priorities across sectors around four Strategic Recovery Objectives (SRO), a policy framework, a financing strategy, and implementation and monitoring arrangements and facilitates engagement with development partners for financial and implementation support (Ministry of Planning Development Special Initiatives 2022).

Pakistan has made significant progress in the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR). The Government of Pakistan, through National Disaster Management Authority, is in the process of aligning its legislative instruments and policy frameworks on disaster risk reduction to three global agreements emerged in 2015. These agreement are: SFDRR, Paris Agreement, and Sustainable Development Goals (UNDRR 2023). In December 2017, Pakistan prepared the National Action Plan for the Implementation of Bangkok Principles on Health Aspects of the Sendai Framework for Disaster Risk Reduction which has served Pakistan for mainstreaming Disaster Risk Reduction into Health Sector (GOP and NDMA 2017).

The Disaster Risk Financing and Insurance (DRFI), Climate Smart Agriculture (CSA) programmes, and Building and Construction Codes have been developed to reduce the vulnerability of the people to climate-induced disasters (UNDRR 2023). These efforts demonstrate Pakistan's commitment to address risk governance and management through mitigating disaster risks and enhancing resilience.

An Overview of Various Policies

Sr.No	Title	Date	Purpose
1	National Clean Air Policy (NCAP)	March 02, 2023	The National Clean Air Policy (NCAP) aims to provide a framework for improving air quality in Pakistan. It is a national document, therefore, focuses on actions at the national scale that can achieve improvements in air quality (MoCC, 2023).
2	National Hazardous Waste Management Policy 2022	July 25, 2022	The National Hazardous Waste Management Policy 2022 aims to facilitate the implementation of international treaties & Conventions at the national level to improve the definition and implementation of Hazardous Waste Management (HWM) for environmental management, clarify institutional responsibilities related to HWM, and strengthen the management of hazardous and other wastes (MoCC 2022).
3	Final Updated National Climate Change Policy-2021	March 18, 2022	Pakistan developed its first National Climate Change Policy (NCCP) in 2012 keeping in view Pakistan's high vulnerability to the adverse impact of climate change, particularly in extreme events. The main focus of the policy was on climate resilient development and adaptation and after the Paris Climate Accord 2015, Pakistan accepted to contribute to the global emissions reduction efforts. Currently, Pakistan has updated its policy and the focus of the NCCP-2021 is equally on adaptation and mitigation. The policy's major emphasis is on nature-based solutions (MoCC 2021).
4	National Electric Vehicle Policy (2019)	July 19, 2021	The main objective of the National Electric Vehicle Policy 2019 is to mitigate climate change impact through a reduction in emissions from transport sector, create a pivot to industrial growth in Pakistan and encourage auto and related industry to move towards local EV manufacturing, forge links with the global EV value chain for export potential of EVs and their parts, meet the objective of generating employment through Green Economy initiatives, reduce oil import bills and develop affiliated industry such as battery manufacturing, charging infrastructure, etc. (MoCC 2010a)
5	National Forest Policy	January 27, 2016	The main goal of National Forest Policy is to expand, protect, and ensure sustainable use of national forests, protected areas, natural habitats and watersheds for restoring ecological functions, improving livelihoods and human health in line with the national priorities and international agreements (Ministry of Climate Change, 2015).

6	National Climate Change Policy 2012	September 03, 2012	The National Climate Change Policy 2012 is a landmark in the Climate Change response in Pakistan. The National Climate Change Policy comprehensively addresses all possible challenges of Climate Change adaptation and mitigation; and makes sure to provide rock solid foundational framework for ensuing Climate Change Action Plans, Programmes, and Projects (MoCC 2021).
7	National Sanitation Policy	August 30, 2012	National Sanitation Policy provides a broad framework and policy guidelines to the federal, provincial, and local governments to enhance and support sanitation coverage in the country through formulation of their sanitation strategies, plans, and programmes (Ministry of Environment 2006)
8	National Rangeland Policy	January 30, 2010	The main objectives of the National Rangeland Policy is to enhance the productivity and related functions and services of the rangeland ecosystem, promote rangeland enterprises for the livelihood improvement of the rangeland dependent communities, conserve and maintain rangeland biodiversity, mitigate the negative impacts of global warming and climate change especially related to the desertification and enhance the skill and capacity of the key stakeholders for the sustainable management of the rangeland management (MoCC, 2010b).
9	National Drinking Water Policy	September 30, 2009	The National Drinking Water Policy aims to improve the quality of life by reducing the incidences of death and illness caused by water-borne diseases. It also provides specific guidelines for increasing access to safe drinking water, protecting and conserving surface and groundwater resources, water treatment and safety, appropriate technologies and standardization, community participation, public awareness, capacity development, public-private partnership, research and development, emergency preparedness and response and coordinated planning and implementation (MoCC 2010b).

10	National Environmental Policy	August 25, 2005	The National Environmental Policy aims to protect, conserve, and restore Pakistan's environment to improve the quality of life of citizens through sustainable development. To achieve this goal, the policy sets the objectives such as: conservation, restoration, and efficient management of environmental resources; integration of environmental considerations in policy making and planning processes; capacity building of government agencies and other stakeholders at all levels for better environmental management; meeting international obligations in line with the national aspirations; and creation of demand for environment through mass awareness and community mobilization.
11	National Resettlement Policy	March 25, 2002	The National Resettlement Policy has been formulated to cover the affected persons in existing systems and to ensure an equitable and uniform treatment of resettlement issues all over Pakistan. It will apply to all development projects involving adverse social impacts, including land acquisition, loss of assets, income, business, etc. The policy also aims to compensate for the loss of income to those who suffer due to loss of communal property, including common assets, productive assets, structures, other fixed assets, income and employment, loss of community networks and services, pasture, water rights, public infrastructure such as mosques, shrines, schools, graveyards, etc. (MoCC, 2002).

Pakistan has also actively participated in several international agreements and protocols related to climate change. Here are some of the key international obligations on climate change to which Pakistan is a signatory:

- United Nations Framework Convention on Climate Change (UNFCCC) 1992
- Kyoto Protocol 1997 (as extension of the UNFCCC 1992)
- The Paris Agreement 2015
- Doha Amendment to the Kyoto Protocol 2013-2020
- Montreal Protocol on Substances that Deplete the Ozone Layer 1987
- The Sendai Framework for Disaster Risk Reduction 2015
- South Asian Association for Regional Cooperation (SAARC) Agreement 1985
- SAARC Agreement on Rapid Response to Natural Disasters 2011

Financial constraints emerge as a major obstacle in advancing development of plans, policies, and projects. There is a decline in international humanitarian support compared to previous disasters such as those in 2005 and 2010. It can be attributed to factors such as the ongoing Ukraine war and Nigerian floods.

The core of effective policy and planning relies on comprehensive data, yet a significant gap exists in terms of data authenticity and availability across sectors such as water, climate, agriculture, food, and health. To bolster disaster preparedness and mitigation, Pakistan should introduce an “Impact Based Weather Forecast System” that assesses weather impacts on agriculture, human health, and infrastructure.

Enhancing disaster resilience necessitates an improved early warning system and real-time flood flow data accuracy. The integration of modern technology into flood prevention strategies is crucial. Areas prone to flooding often remain underutilized for prolonged periods, making it imperative to develop climate-smart agriculture and resilient infrastructure to harness their potential while minimizing risks. Centralized platforms for coordination and collaboration at the national level are essential to address disasters and crises comprehensively. This platform should involve NGOs, INGOs, donors, and the government to ensure equitable development and aid-related projects.

Local actors and community-based organizations can play a pivotal role in understanding the challenges and opportunities unique to their areas. Their insights aid local officials in effective communication and engagement with diverse community members. International partnerships and funding support are instrumental in empowering local actors, enabling the localization of interventions, and strengthening partnerships for culturally suitable approaches. Local actors need to engage with their communities, gain geographical insights, and develop analytical skills to anticipate potential crises. Disaster-related NGOs hold a special position in Pakistan, as they possess the ability to assess the humanitarian needs of flood-affected populations and other disaster-prone areas.

The immediate humanitarian needs are not enough to create a disaster response cycle. It needs rehabilitation and reconstruction which need huge resources that is why the debate has been around reparation for losses and damages during the climatic disasters. The flood 2022 by its scale and nature has been adjudged as a climatic disaster and hence Pakistan pushes the case of loss and damage fund.

9. Challenges in Acquiring Loss and Damage Fund

Loss and Damage Fund is meant to support long-term adaptation and resilience efforts. There is a need to develop sustainable and effective strategies to address the current and future climate impacts. Pakistan, like many other countries, has multiple development priorities, such as infrastructure development, poverty reduction, education, and healthcare. Allocating resources to cope with climate-induced disasters and acquiring loss and damage funds can be difficult in the face of these competing needs with limited resources and administrative capacity.

The procedure of securing financial resources to address loss and damage is a complex and challenging task for Pakistan. There is often misunderstanding between Loss and Damage Financing and Adaptation Financing, which aids in reducing L&D, and to some extent with mitigation financing, which aims to prevent L&D. Loss and Damage financing cannot be solely dependent on humanitarian aid and equated with Disaster Risk Reduction (DRR) (Sharma-Khushal et al., 2022). Pakistan faces evidence-based data availability challenge to build a case to access funds in lieu of loss and damage as it requires to provide substantial evidence of the adverse impacts of climate change the country is experiencing, as well as the costs incurred. Demonstrating the direct link between climate-induced event and the resulting

loss and damage can be a significant challenge as collecting accurate and appropriate data seems to be a gigantic task. The government and indigenous think tanks need to work to cover the data gap. The unavailability or weak social safety nets and financial risk-transfer mechanisms to deal with climate-

Way Forward from Voice of Community

To enhance community-level preparedness and disaster risk reduction (DRR) practices and thereby minimizing losses and damage, several key measures need to be undertaken. Firstly, comprehensive training programmes should be organized to educate community members about disaster response protocols, evacuation procedures, and basic first aid. Secondly, the implementation of localized early warning systems, coupled with regular drills, can significantly improve readiness for emergencies. Thirdly, fostering partnerships between government agencies, non-governmental organizations, and communities will promote effective coordination and resource allocation during crises. Furthermore, community-based workshops and awareness campaigns can empower residents to identify local risks and contribute to tailored DRR strategies. Lastly, integrating traditional knowledge and local practices into modern disaster management frameworks can enhance overall resilience. By prioritizing these actions, a more resilient and prepared community can emerge, better equipped to minimize the impact of future disasters.

To enhance disaster preparedness, response, and recovery efforts, it is recommended to establish localized early warning systems, conduct regular community training, and foster collaborative partnerships between government agencies, NGOs, and local communities. Launching comprehensive public awareness campaigns, developing tailored emergency plans, and investing in infrastructure readiness, particularly in remote areas, are crucial. Continuously reviewing and refining disaster management policies, integrating local knowledge, and ensuring equitable resource allocation are imperative. Leveraging technology for real-time monitoring, supporting research and innovation, and establishing inclusive disaster governance structures will contribute to a comprehensive approach that enhances resilience and minimizes the impact of future disasters.

Source: FGD conducted in Goth Sardar Khan, Sohbatpur district, by Ms Kalsoom, Ms Shabana and Mr Arshad Ali on 16 August 2023.

induced disasters pose another challenge for the country. The short-term project-based financing for L&D cannot mitigate the climate-induced disasters and help the country to rehabilitate and recover from the disasters.

The proactive financial protection strategies such as the risk insurance fund would build Pakistan's financial response capacity in the aftermath of disasters and reduce the economic and fiscal burden of natural disasters by transferring L&D to private capital and insurance markets. In March 2023, the L&D Fund related matters were discussed by the first transitional committee in Luxor, Egypt. The committee stated that the L&D Fund could be finalized and set in place by COP 28 in the United Arab Emirates (UAE). The committee also made an agreement over the roadmap to create the fund and draft guidelines for L&D. However, the key issues around resources of financing and projects covered under the fund were not addressed. There is a challenge in deciding the scope, mechanism, and criteria for deciding the eligibility of countries financing (Lama El Hatow, 2023).

10. Conclusion

The discussion and propositions above conclude that the effects of global climate change seem evident in the form of the growing frequency of droughts, floods, erratic weather behaviour, changes in agricultural patterns, reduction in freshwater supply, and the loss of biodiversity in Pakistan.

In 2022, Pakistan experienced one of the most severe floods in history, causing significant loss and damage to the country's infrastructure, economy, and livelihoods. The floods submerged one-third of the country under water, displaced around eight million people, and affected 33 million people. Sindh is the worst affected province with close to 70% of total damage and losses, followed by Balochistan, Khyber Pakhtunkhwa, and the Punjab. It is estimated that the total damage is equivalent to 4.8% of FY22 gross GDP.

The recovery and reconstruction needs are projected as much as 1.6 times the budgeted national development expenditure for the fiscal year 2023. Housing, Agriculture and Livestock, and Transport and Communications sectors suffered the most significant damage, at US\$5.6 billion, US\$3.7 billion, and US\$3.3 billion respectively. The PDNA suggests that the national poverty rate will increase by 3.7 to 4.0% points, pushing an additional 8.4 to 9.1 million people into poverty.

The human and ecosystem vulnerability to climate change and induced disasters have generated the debate on the effectiveness and efficiency of national and international responses to mitigation and adaptation of climate change. While taking various steps to combat climate-induced disasters, Pakistan enacted the Climate Change Act in 2017 which provides comprehensive national adaptation and mitigation policies, plans, and programmes for climate-induced challenges.

Amid the loss and damage caused by the 2022 floods and the current economic crisis, it is very challenging for Pakistan to recover from the damage without international financial assistance. Therefore, under the Paris Agreement 2015, Pakistan needs funding under climate change adaptation and mitigation and reparation for loss and damage.

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