

# Climate change-induced loss and damage in Pakistan:

## An investigation of Impacts on Society and the Economy

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### Key Recommendations

Pakistan needs to develop a national level, integrated multi-hazard L&D database for systematic vulnerability and risk monitoring to ensure planning on L&D is complemented with accurate information.

The National Disaster Management Authority (NDMA) needs to set up a national mechanism within its existing structure for the sole responsibility in dealing with L&D on a national scale.

The conversation on L&D needs to occur in parallel with adaptation efforts in Pakistan.

L&D costs need to be measured using conventional methodologies and indicators.

It is critical Pakistan complies with the stipulations of the Paris Agreement as this will make a strong case for both monetary and technical assistance needed for L&D.

There needs to be a clear and sensitive communications strategy for mainstreaming the concept of L&D into public and policy discourse.

*This paper aims to raise awareness about Loss and Damage (L&D) and ignite conversation about how Disaster Risk Reduction (DRR), Climate Change Adaptation (CCA) and Loss & Damage (L&D) can be linked in order to ensure more sustainable strategies for building resilience in Pakistan.*

### I. Global Discourse on Loss and Damage

As the green-topped gavel came down on 12<sup>th</sup> December 2015 at the 21<sup>st</sup> Conference of Parties (COP) of the UN Framework Convention on Climate Change, signalling that the Paris Agreement had been signed, representatives from 196 countries rejoiced in the knowledge that there was finally consensus on pathways to limit global warming to below 2°C<sup>1</sup>. A key component of this COP was the use of Intended Nationally Determined Contributions (INDCs)<sup>2</sup>, submitted by UNFCCC member nations, to determine how far current and planned mitigation and adaptation activities by countries will take the world in limiting global warming and its impacts, and what remains to be done to ensure it remains below 'dangerous' levels. Despite the outcome of COP 21 being heralded as a landmark agreement and a revolution in international climate negotiations, no amount of mitigation will remove the carbon emissions already 'locked-in', and no amount of adaptation will prevent impacts that exceed the adaptation thresholds of individuals, communities and countries. This 'residual impact' of climate change will not only be in the form of damages that society can recover from but also losses that are irreparable. Though these impacts are considered unavoidable and inevitable, the global climate community has realized that there is a realm that exists beyond hopelessness and resignation to fate, and that avenues exist for at least assuaging

<sup>1</sup> <http://www.cop21paris.org>

<sup>2</sup> Countries agreed to publicly outline what post-2020 climate actions they intend to take under a new international agreement, known as their Intended Nationally Determined Contributions (INDCs). The INDCs will largely determine whether the world achieves an ambitious 2015 agreement and is put on a path toward a low-carbon, climate-resilient future. INDC submissions can be accessed at <http://www4.unfccc.int/submissions/INDC/Submission%20Pages/submissions.aspx>

### Box.1 Working Definition of Loss and Damage

“Damage” can be seen as negative impacts that can be repaired or restored (such as windstorm damage to the roof of a building, or damage to a coastal mangrove forest from coastal surges which affect villages).

“Loss” can be characterized as negative impacts that cannot be repaired or restored (such as loss of geologic freshwater sources related to glacial melt or desertification, or loss of culture or heritage associated with potential population redistribution away from areas that become less habitable over time with climate change).

**Source:** Adopted from Loss and Damage in Vulnerable Countries Initiative, 2012

the impact of these costs on human systems and societies. Perhaps the highest costs will stem from the threat of large scale inundation and eventual submergence of Small Island States (SIS) and the mass displacement of communities especially in the developing world, for whom preventative adaptation and proactive mitigation will not suffice. Thus, the quantification and assessment of these costs and possible ways to cope with them have forged a new branch of inquiry within the climate discourse – Loss and Damage.

## II. What is Loss and Damage?

Having realized that even the best case scenario with current mitigation and adaptation efforts will not suffice to avert all the harms posed by climate change, the world is now beginning to theorize the concept of L&D and to derive actionable and feasible policy initiatives. Presently, no commonly agreed definition of loss and damage exists however, an initiative taken by the Government of Bangladesh with support from the Climate Development and Knowledge Network’s (CDKN) attempts to set the basic parameters (Box 1) of a common understanding around L&D and provide insights into what it entails for vulnerable countries<sup>3</sup>. Originally, the term L&D appeared in UNFCCC negotiations in 2007 at COP 13, where the Bali Action Plan called for enhanced action on adaptation including the consideration of “disaster risk reduction strategies and means to address L&D associated with climate change impacts in vulnerable countries” (UNFCCC,2007: p.2). In 2008, Alliance of Small Island States (AOSIS) proposed a

Multi-Window Mechanism to address and finance L&D as a separate concept from adaptation. Following this, the UNFCCC’s Work Program on Loss and Damage was established in 2010 and later, the Warsaw International Mechanism (WIM) on Loss and Damage in 2013. Both stressed the need for action to reduce vulnerability associated with L&D. Placed under the Cancun Adaptation Framework (CAF), WIM is the key instrument within the UNFCCC mandate to promote implementation of strategies to limit and cope with L&D associated with both extreme and slow onset events.

## III. Evidence of Loss and Damage in Pakistan

Despite contributing only 0.8 per cent<sup>4</sup> to the world’s total Greenhouse Gas emissions, Pakistan is facing severe impacts from climate change. Pakistan is among the 15 countries (Maplecroft, 2014) to be hit hardest by effects of climate change even though it contributes only a fraction to global warming.

Flooding is the hazard Pakistan is at risk from the most. Increasing glacial melt from the Himalayan ranges as a result of rising global temperatures swells the rivers and tributaries of the Indus River Basin, inundating large parts of the country every year since 2010. At the same time, since these glacial reserves supply more than 70% of river flows in Pakistan, glacial recession is expected to decrease river flows within the next two to three decades. Eighty percent of this water flowing from glaciers irrigates the cultivated lands of Pakistan. Agricultural production accounts for 21 per cent of GDP and 60 per cent of exports (Ministry of

<sup>3</sup> [http://cdkn.org/project/work-programme-for-ldcs-on-loss-and-damage/?loclang=en\\_gb](http://cdkn.org/project/work-programme-for-ldcs-on-loss-and-damage/?loclang=en_gb)

<sup>4</sup> According to a draft of Pakistan’s INDC, Pakistan with 2.06 Gt per capita GHG emissions stand at 135th place in the world ranking of the countries on the basis of their per capita GHG emissions

Finance, 2014). As a semi-arid developing country with an agrarian economy, the threat of climate change to irrigated agriculture translates into high risk for the entire country.

Further, by the end of the 21<sup>st</sup> century (2081 – 2100), global surface temperatures are expected to increase by over 1.5°C, while warming is likely to exceed 2°C based on all but 1 of the RCPs used in the 5<sup>th</sup> Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)<sup>5</sup>. Precipitation is also expected to vary greatly as a result of the changing climate<sup>6</sup>. Varying levels of precipitation, shifts in extreme temperature means, changing weather patterns and increasing water stress will potentially translate into severe implications for most sectors in Pakistan including agriculture, human health, livelihoods, and infrastructure.

An Annual Disasters Statistical Review by Centre for Research on the Epidemiology of Disasters (CRED)<sup>7</sup> in Brussels noted that extreme events in the form of hydro meteorological disasters (floods, cyclones and droughts, etc.) caused by climate change have become more frequent across the world. This finding is also supported by data in Pakistan which shows that the frequency of these events has increased. Around 23% of the country's

land and nearly 50% of the entire population is vulnerable to various impacts of sudden-onset climate events; rise in sea level, glacial retreat, higher average temperatures, and higher frequency of droughts (Ahmad et al., 2010). The extent of damage caused by the floods of 2010 can be gauged by the figures presented in Box 2, which is one way of representing the risk posed by climate change to Pakistan. Since 2010, there have been attempts at the policy level to limit and, where possible, prevent future harm from climate change. The National Climate Change Policy 2012 and the National Disaster Management Plan of 2013 are two examples of concern and commitment in the upper echelons of governance in Pakistan. However, there is also acknowledgement that even implementation of planned interventions to a fault will not shield vulnerable communities from all possible harms or off-set the losses they have suffered. Thus, the conversation on addressing L&D from climate change needs to happen in parallel with the efforts to adapt to it in Pakistan.

#### **Box 2. Estimates of loss and damage from Pakistan Floods 2010**

The gross impact of floods in 2010 amounted to 5.8% of the Pakistani 2009/10 GDP making it considerably more costly – in relative terms – than the 2011 Japanese Tsunami (4.6%) (World Bank and ADB, 2010). Flooding and overflowing rivers caused substantial damage to 14 districts, particularly to the Southern and Northern parts of the country in 2010. These floods:

- Affected 20 million people
- Killed 1781
- Displaced millions
- Damaged 1.8 million homes
- Damaged 5.9 million acres of farmland

The World Bank and ADB (2010) place the cost of damages at \$10 billion (\$5b in the agriculture sector). As well as damage to infrastructure, which affected governance, education, energy, business and communications, the flooding led to widespread health risks from malaria, cholera, and severe malnutrition. With the economy heavily dependent on agriculture, the economic impacts are grave with 5.3m jobs lost (ILO, 2010) and about US\$25–30 billion used on infrastructure and compensation.

IV.

<sup>5</sup> Climate Change 2014, Synthesis Report, Summary for Policy Makers: [https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5\\_SYR\\_FINAL\\_SPM.pdf](https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf)

<sup>6</sup> Planning Commission of Pakistan, Task Force Report on Climate Change, 2012

<sup>7</sup> <http://www.cred.be/publications>

## Translating Climate Vulnerability in L&D

Extreme weather events and other climate impacts already threaten the lives, livelihoods and wellbeing of communities, especially those that are already vulnerable due to non-climatic factors. This disparity often guides interventions so that those most in need of assistance to build climate-resilience are prioritized. Since poverty and lack of assets is already a major driver of climate vulnerability, it is likely that the same demographic will disproportionately bear the burden of L&D. The future economic impact could include structural damage from floods, or crop loss due to drought or extreme heat. Non-economic losses could include destruction of historic or culturally significant sites, the rendering of terrains uninhabitable, or extinction of species. The damages can be recovered while losses cannot. Pakistan stands to suffer on both counts due to the predominantly agrarian nature of its economy, its dependence on natural systems, and its wealth of biodiversity and cultural heritage. Thus, as Pakistan develops pathways to mainstream climate resilience into development planning and growth strategies, it needs to develop contingencies for addressing future L&D.

Non-Economic Loss and Damage (NELD) is an especially difficult policy terrain, due to the context-dependence and incommensurability of associated costs. However, the current challenge is to overcome limitations of data and contested methodologies and to quantify and assess costs that can be measured using conventional methodologies and indicators

## V. National level Response to Loss and Damage

The National Disaster Management Authority (NDMA) notes in the Disaster Risk Reduction Policy (2013) that the unprecedented costs imposed by disasters in the past decade could have been largely reduced through preparedness, prevention, and mitigation. In other words, a large proportion of the costs incurred can be characterized as 'unavoided' L&D. These costs have wreaked havoc on communities, the local and national economy, and consequently hampered development. However, like most developing countries Pakistan does not have comprehensive social safety nets or financial risk-transfer mechanisms to deal with L&D

from climate-induced hazards and disasters. While extra-budgetary support may be provided by development agencies in the case of disasters, or through substantial bilateral or multilateral donations following major disasters, these responses are typically short term and ad hoc, and highly dependent on the financial situation of donor countries and on the media response to disasters. While ex-post facto disaster funding from donors and multilateral financial institutions can be an important part of a government's disaster risk management strategy, over-reliance on this approach has major limitations in terms of efficiency, effectiveness, and sufficiency. When finances raised are not sufficient nor timely, lives and livelihoods are lost and recovery and long-term development are compromised. In one of the four provinces of Pakistan, Baluchistan, one year after the floods of 2010, a conservative study showed that 18,000 people were still reported to be affected (Hasnain 2011).

It has been widely argued that for future climate impacts, finances should not be allocated from general disaster relief funds, just as it has been argued that adaptation to climate change should not come from general development funds (Action aid, 2009). The general trend in most countries is towards insurance solutions to provide sufficient incentives for prevention and to encourage 'safe' behaviour. Both the National Climate Change Policy (2012) and National Disaster Risk Reduction Policy (2013) provide a robust basis for development of an assessment and compensation mechanism including insurance for L&D occurring from climate induced disasters.

The National Disaster Management Authority (NDMA) in Pakistan is currently developing an integrated risk management system to increase resilience and enhance economic development (CDKN, 2012). A risk transfer mechanism, with technical support from the Climate Development and Knowledge Network (CDKN) is being developed to protect lower income groups against losses from extreme events that are expected to increase in frequency due to climate change. This Disaster Risk Insurance mechanism will provide low-income households easy accessible and affordable insurance. This could potentially cover any one or a combination of ways in which households are impacted: i) demise of the bread-

earner; ii) food insecurity; iii) shelter damage; iv) livestock damage; and v) crop damage.

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. However, these strategies need to be premised on evidence-based recommendations and need to ensure that relevant actors are incentivized to act responsibly and mitigate risks from climate change. A useful tool for such an endeavour would be L&D assessments. Such assessments of the costs that will be incurred regardless of pre-emptive action will delineate then line between adaptation-development investment and financial risk transfer. In addition, such assessments can provide insights into patterns of vulnerability, hazard occurrence, magnitude and severity. Currently, data is scattered across various organizations and any systemic centralized vulnerability and risk monitoring is lacking (Nadeem, 2015). Undertaking systematic and coordinated assessments of L&D is therefore, a good first step towards gathering this information and towards a recognition of the limitations of adaptation.

## VI. Recommendations

At the level of policy and popular discourse, there needs to be an acknowledgement of the reality of residual impact and L&D. Communities, as well as policy makers, need to be aware of the limitations of adaptation in preventing harmful impacts of climate change. This is more challenging than it sounds as reminding constituents of the ostensible inadequacy of current adaptation investment is akin to political suicide, especially for career politicians. Thus, there needs to be a clear and sensitive communication strategy for mainstreaming the concept of L&D into public and policy discourse.

According to Mr. Zahid Hamid, Federal Minister for Climate Change, the cost of adaptation for Pakistan is likely to be \$14 Billion per year<sup>8</sup>. Viewed through the L&D lens, it is obvious that additional funding

will be required to cope with the impacts that persist beyond the adaptation threshold. In order to make a case for support from international funds – Adaptation Fund, Green Climate Fund, etc. - it is critical to comply with the stipulations of the Paris Agreement, which Pakistan is a signatory to. Given the lack of quantifiable targets and indicator-based commitments in Pakistan's INDC, it is important that the country gathers data on emissions and assesses its adaptation needs before it proceeds to promulgate concrete targets that are in line with the Paris Agreement. A large pool of exposure data exists but they are not aggregated. Disaster Risk Reduction (DRR) knowledge and information management about risk and vulnerabilities through collection, compilation and dissemination of relevant information is vital to implement policies on L&D. In addition to filling data deficiencies, this will also make a compelling case for much needed monetary and technical assistance for climate resilience and future L&D.

There is a strong need to perform state-of-the-art risk assessments to enable financial risk transfer and to support other risk management measures. Thus, Pakistan needs to develop a national level, integrated multi-hazard L&D data-base for systematic vulnerability and risk monitoring to ensure planning on L&D is fed with accurate information.

NDMA should consider setting up a national mechanism within its existing structure which could be solely responsible for all national matters dealing with L&D in the context of comprehensive climate risk management.

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<sup>8</sup> Address to the UNFCCC at COP21.

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