REQUEST RESPONSE

Climate Impacts on Learning Continuity in Bangladesh: A Rapid Assessment

REQUEST SUBMISSION

This request seeks a rapid assessment to generate actionable evidence on how repeated climate-related shocks—particularly severe flooding and extreme heat—are disrupting learning continuity for children in Bangladesh's most vulnerable areas. The findings are expected to contribute the design of the Education in Emergencies component of PEDP5 by assessing learning losses, school disruptions, and local response measures, and by providing practical, low-cost recommendations for government and donors to support continued education.

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EXECUTIVE SUMMARY

Bangladesh's primary education system is facing mounting pressures from increasingly frequent and severe climate events. Cyclones, flash floods, prolonged waterlogging, tidal surges, and heatwaves now interrupt schooling with regularity, creating cumulative and inequitable learning losses for millions of children. This rapid assessment, conducted in the most climate-affected upazilas of Barishal and Sylhet divisions, provides a detailed examination of how extreme climate events influence school operations, educational access, learning continuity, and disability inclusion. The findings highlight critical vulnerabilities and resilient local practices that have direct implications for the design of the Fifth Primary Education Development Program (PEDP5).

The assessment draws on qualitative interviews with 83 head teachers, 222 class teachers, and 23 Education Officers, complemented by 2273 student assessments from 83 government primary schools of 16 climate-affected upazilas of Barishal and Sylhet division. The geographic focus areas represent some of Bangladesh's most climate-exposed settings, including coastal cyclone belts and haor wetlands prone to seasonal flooding. Across this landscape, the study identified significant disruptions to schooling, systemic implementation gaps, and diverse local responses that together paint a nuanced picture of climate impacts on primary education.

Climate risks and their impact on schooling

Schools across both divisions reported repeated closures and operational disruptions due to climate hazards. In Sylhet's haor region, where flooding persists for months, children miss up to 90 school days per year. Around two-fifth of students from flood-affected villages could not attend school for extended periods during monsoon season, which lasts three to four months. In Barishal's cyclone-prone coastal belt, storm surges and tidal flooding regularly damage infrastructure and inhibit safe travel, reducing attendance by 30%.

These disruptions also affect teacher and student well-being. Over 75% of head teachers and 80% of assistant teachers reported that climate events negatively affected their own well-being and their students' emotional stability. Teachers described widespread anxiety among children during and after disasters, which affected attention, classroom participation, and motivation. The assessment revealed that climate events are no longer temporary shocks, they are chronic stressors with year-round educational consequences.

Despite considerable challenges, teachers demonstrated strong commitment to maintaining learning continuity. Many continued lessons on verandas, embankments, or in cyclone shelters when classrooms were unusable. However, these were teacher-led improvisations rather than systemic solutions; in the absence of formal guidance, learning continuity remained uneven and inconsistent.

Learning loss, attendance gaps, and recovery challenges

The study indicated substantial learning deficiencies across climate-affected schools. Teachers consistently reported regression in foundational literacy and numeracy among students who missed weeks or months of instruction. When students returned, they required extensive catch-up support. In some flood-prone schools, teachers estimated that around half of students returned with "significant or severe" learning gaps. Our assessment also found that only half of the total students had demonstrated story reading or above reading level competencies, while only one-third of the students showed multiplication or above numeracy level competencies, and in both subjects Sylhet–affected by long-term school closure due to floods–performed significantly lower than Barishal. Additionally, learning gaps were widest for children with disabilities across both areas.

Our assessment indicates that the system lacks structured support for learning recovery. While teachers used small-chunk lessons, micro-grouping, and weekend sessions, these strategies were informal and inconsistent. There is a critical lack of a standardised framework for evaluating and supporting learning continuity and recovery across disaster prone areas.

Teacher well-being and workforce challenges

Teacher shortages, driven by natural disasters, emerged as one of the most acute and persistent gaps. In some remote schools, particularly in the Sylhet region, staffing constraints made it impossible to continue proper learning support and address individual learning needs. During disasters, teachers leave schools due to transportation and accessibility challenges, and due to these persistent challenges getting replacement teachers becomes a prolonged issue. Teacher absenteeism also increased during climate events due to unsafe mobility conditions.

Teachers frequently reported emotional burnout linked to climate disasters. Over 80% noted increased stress during cycles of closure and reopening, exacerbated by expectations for rapid recovery without adequate support. The system has no structured mechanisms for teacher well-being, despite growing climate-induced pressures.

Community engagement and local response capacity

One of the most positive findings in our research is the active role of communities in supporting school operations during crises. Communities provided boats in Sylhet region, enabling teachers and students to travel when roads remained submerged. Teachers noted that strong community support increased attendance significantly during peak flooding periods.

School management committees (SMCs) and youth volunteers also engaged in early warning dissemination, securing buildings, preparing shelters, and supporting rapid reopening. In several schools in the Barishal region, community-led cleaning operations allowed schools to reopen within 48–72 hours after floodwaters receded. However, this support remains informal and inconsistent in many cases.

Disability inclusion: Significant equity gap

The study identified significant gaps in disability inclusion, exacerbated by climate disasters. Although national guidelines mandate accessible infrastructure, many schools lacked functional ramps, accessible WASH facilities, or safe routes. Even in newly built schools, ramps were frequently blocked or unusable. In addition, the prevalence of children with disabilities remained unrecognised due to systemic barriers, leaving them without any form of specialised support. These situations point to deep-rooted gaps in early identification and individualised intervention. Consequently, students with disabilities were often the first to drop out and the last to return after floods due to reduced accessibility and mobility constraints. In the absence of accessible infrastructure, safe evacuation routes, and appropriate learning accommodations, climate vulnerability translated into increased educational exclusion for disabled children.

School infrastructure and preparedness

More general school infrastructure gaps remain substantial. Although PEDP4 introduced disaster-resilient standards, the assessment found many schools without elevated WASH blocks or safe storage for materials. In several flooded schools, toilet facilities became unusable for weeks. During field visits, teachers reported unsafe or damaged access routes, including broken stairs, flooded

compounds, and slippery surfaces—often preventing access of students with disabilities—during flooding.

Schools nonetheless demonstrated strong readiness to reopen quickly. In some schools in Barishal, parents and SMC members restored classrooms within three days, enabling rapid resumption of instruction. However, Upazila Education Officers (UEO)s and District Primary Education Officers (DPEOs) reported lack of immediate emergency budgets, delaying official repair and rehabilitation efforts.

Implications for PEDP5

This study reveals several systemic gaps that Fifth Primary Education Development Program (PEDP5) must address to ensure climate-resilient, equitable, and inclusive primary education:

1. **Teacher deployment reforms:** Hard-to-reach schools require revised deployment policies, with incentives, rotation mechanisms, and mobility support to ensure teacher availability during and after climate disasters.
2. **Learning continuity framework:** Climate affected schools require standardised learning continuity frameworks, building on observed teacher improvisation, to ensure remote learning during closures and rapid catch up post-crisis.
3. **Disability inclusion operationalisations:** PEDP5 must ensure a more robust implementation and monitoring of PEDP4 disaster resilience standards to improve infrastructure resilience, specifically for highly vulnerable children with disabilities.
4. **Emergency recovery fund:** Schools need fast-access and rapidly accessible, decentralised funds for immediate restoration and rehabilitation after disasters, to reduce prolonged school closures.
5. **Teacher well-being focus:** Structured mechanisms for supporting teacher well-being during and after crises, including structured teacher well-being approaches, are essential in supporting retention and rapid reopening, post crisis.
6. **Building on community support:** communities, including SMCs and Youth Volunteers, play an essential role in preparedness and response, yet lack consistent oversight, support, resources and training to better standardise and strengthen their essential role in disaster resilience.

Climate change is reshaping the educational landscape in Bangladesh. Without targeted action, learning inequalities will widen, especially for children in hard-to-reach and disaster-prone regions. PEDP5 offers an opportunity to operationalise resilience—transforming local strengths into systemic capacity. Development partners can play a critical role by supporting the government to design flexible, inclusive, and climate-responsive mechanisms that ensure learning continues for every child, in every circumstance.

INTRODUCTION

Climate-related disruptions—ranging from sudden shocks like cyclones and floods, to slower-onset hazards such as rising heat, salinity, and erosion—are increasingly recognised as serious impediments to educational continuity, quality, and equity. Research shows that school closures, damaged infrastructure, and disrupted learning routines disproportionately affect children in hazard-prone areas, undermine foundational learning, and widen existing inequalities (UNICEF, 2024a; 2024b). Globally, the education in emergencies literature emphasises that risk is unevenly distributed with children from poorer households, girls, and those with disabilities often bearing the brunt of interrupted learning (Hossain, 2021).

Bangladesh, which ranks ninth globally for disaster risk in the World Risk Index (WRI) 2024 (Weller & Schneider, 2024), is one of the world's most climate-vulnerable countries. It experiences frequent and intensifying hazards such as cyclones, floods, riverbank erosion, droughts, extreme heat, tidal surges, tornadoes, river erosion, infrastructure collapse, waterlogging, salinity intrusion, and various forms of pollution (BBS, 2022; BANBEIS, 2024). Throughout the 20th century, Bangladesh endured some of the world's most devastating climate events. The 1970 Cyclone alone claimed up to half a million lives, while the 1991 Cyclone killed over 138,000 people. Repeated coastal storms in 1965, 1985, 1988, and 1997 further destroyed homes, schools, and livelihoods. Floods in 1954, 1974, 1987, 1988, and 1998 inundated more than half the country, displacing millions (Haque et al., 2012; Rashid & Paul, 2014). These shocks also repeatedly disrupt school calendars, damage infrastructure and learning materials, displace families, and erode the enabling conditions for learning continuity. Children in hard-to-reach and disaster-prone areas, urban slums, and erosion-affected settlements are disproportionately impacted.

Since 2000, Bangladesh has experienced a sequence of climate-related disasters that have progressively reshaped its educational landscape across divisions. Major floods in 2004 and 2007 inundated large parts of Dhaka, Rajshahi, and Sylhet divisions, submerging thousands of schools, damaging learning materials, and keeping children out of classrooms for months (World Bank, 2008; Islam et al., 2021). The coastal cyclones Sidr (2007) and Aila (2009) devastated Barishal and Khulna divisions, destroying over 4,000 schools and forcing prolonged closures as buildings were converted into shelters. In the following decade, recurring floods (2012, 2014, 2017) in Sylhet and Rangpur disrupted school operations and contributed to chronic absenteeism. Cyclone Roanu (2016), Fani (2019), and Bulbul (2019) again hit the southern coast, damaging school infrastructure and interrupting exams. The 2020s brought compounding hazards: Cyclone Amphan (2020) destroyed over 1,000 schools in coastal belts, while the 2022 Sylhet flood submerged 5,000 schools (Islam et al., 2021). In 2024, an unprecedented heatwave, flooding, and Cyclone Remal combined to disrupt learning for nearly 35 million children (UNICEF, January 2025; 24 January 2025). Meanwhile, riverbank erosion in Rajshahi and Rangpur continues to displace families and dismantle schools annually.

Across two decades, these escalating shocks have eroded instructional time, widened learning gaps, and exposed deep inequalities in educational resilience across Bangladesh's divisions. These shocks not only disrupt academic schedules but also deeply affect children's mental health, emotional well-being, and sense of safety (UNICEF, 24 January 2025; Cruz, 2020; Vergunst, F., Berry, H. L., 2022; Jennifer et al. 2021). Further, teachers, already burdened with heavy workloads, find themselves acting as counselors, caregivers, and community responders without adequate preparation or institutional support. Yet, despite these challenges, many educators and communities demonstrate remarkable coping mechanisms by organising temporary learning spaces, conducting home visits, and maintaining learning continuity under extraordinary conditions (Farid et al., 2021; Bain, 2023).

Against this backdrop, Bangladesh's education system has made notable progress in access and equity but continues to struggle with quality and resilience. The country was among the first low- and middle-income nations to achieve gender parity in both primary and lower secondary education (World Bank, 2016; Al-Zayed et al., 2018), reflecting a strong policy commitment to inclusive schooling. However, these gains have not translated to learning outcomes. The National Student Assessment (NSA, 2022) revealed that only about half of Grade 3 and 5 learners reach grade-level competencies in Bangla, while just one in three demonstrate grade-specific proficiency in mathematics (DPE, 2023). Repeated school closures—first from the COVID-19 pandemic and later from political unrest and climate-induced emergencies—have further deepened these learning gaps, exposing the system's limited preparedness to sustain education during crises.

Within this evolving policy context, the Government of Bangladesh and development partners are designing the PEDP5 as PEDP4 concludes in June 2026. However, decision-makers lack timely, context-specific evidence on how extreme climate events are affecting learning continuity and on which low-cost, practical responses can help to protect access and learning in the most exposed areas. To address this gap, this Rapid Assessment was undertaken based on Terms of Reference (ToR) developed and reviewed jointly by the Foreign, Commonwealth and Development Office (FCDO) and other Education Development Partners (EDP), who provide technical assistance to the Ministry of Primary and Mass Education (MoPME). It focused on administrative divisions that experienced severe flooding, cyclones, and extreme climate in recent years, to generate actionable evidence on disruptions to teaching and learning, document school- and system-level responses, and distill feasible recommendations to inform the Education in Emergencies (EiE) sub-component of PEDP5.

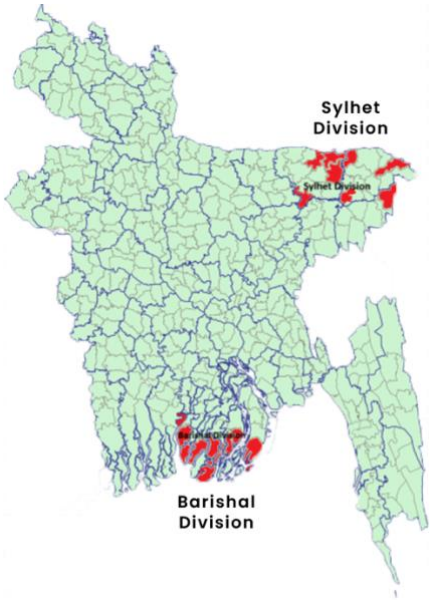
Policy structure

Bangladesh's approach to managing climate-related disruptions in the education sector is shaped by a layered governance system in which the Ministry of Primary and Mass Education (MoPME) operates within the broader national disaster management architecture. The country's disaster governance is anchored in the Disaster Management Act of 2012, which mandates a coordinated, multi-sectoral system for disaster risk reduction and response across all ministries, including education (GoB, 2012). This Act institutionalises bodies such as the National Disaster Management Council, the Inter-Ministerial Disaster Management Coordination Committee, and the Department of Disaster Management (DDM), each responsible for guiding preparedness, response, and recovery. Education is formally recognised as a critical sector whose continuity must be protected during crises.

The operational mechanisms through which this system functions are detailed in the Standing Orders on Disaster (SOD, 2019). The SOD assigns explicit responsibilities to MoPME and its affiliated institutions at national, district, and upazila levels. These responsibilities include receiving and disseminating early warnings, preparing schools for impending hazards, coordinating temporary closures, and ensuring that education services resume as soon as conditions allow. SOD protocols require Upazila Education Offices and District Primary Education Offices to work directly with Local Disaster Management Committees, linking national directives to school-level action. This coordination is essential because climate events such as floods, cyclones, and heatwaves often disrupt not only school operations but also transportation, safety, and community-based support systems that affect students and teachers.

Over time, national policy instruments have increasingly emphasised resilience within the education sector. The National Plan for Disaster Management (NPDM) 2021–2025 reinforces a resilience-oriented vision that prioritises safe learning environments, child protection, and continuity of education during emergencies (GoB, 2021). It calls for stronger school infrastructure, risk-informed planning, and

deeper coordination between MoPME, DDM, and local authorities, acknowledging that disruptions to education have long-term implications for learning outcomes and equity.



MoPME has translated these national directives into operational action through the PEDP4 (PEDP4, 2018–2023; extended to 2026). PEDP4 includes a dedicated Education in Emergencies (EiE) component designed to support school safety planning, develop contingency budgets, and train teachers on emergency preparedness and response (MoPME, 2018). When disasters occur, PEDP4 mechanisms facilitate the rapid assessment of damages, allocation of rehabilitation funds, and deployment of temporary learning arrangements. However, the speed and quality of these responses vary across regions depending on local capacity, availability of personnel, and the effectiveness of coordination between education officials and disaster management committees.

In practice, the interplay between MoPME and the national disaster response mechanism determines how effectively schools prepare for, respond to, and recover from climate-related events. Early warnings issued by DDM are disseminated through MoPME channels to schools, prompting pre-disaster actions such as evacuations or temporary closures. During emergencies, MoPME and local disaster committees coordinate to ensure student safety, relocate classes to safer spaces if necessary, and mobilise teachers for community support. After disasters, joint assessments guide the restoration of school infrastructure, resumption of classes, and implementation of catch-up learning programs. Efficient functioning of this system requires not only formal policies but also adequate funding, trained personnel, and strong local leadership—factors that influence whether climate-induced disruptions become temporary setbacks or lead to prolonged learning loss.

Overall, this governance system reflects a growing national commitment to safeguarding learning continuity. Yet, persistent challenges—ranging from resource delays and uneven local capacity to inadequate disability-inclusive provisions—indicate that the effectiveness of climate response in schools depends heavily on the strength of coordination between MoPME, DDM, and local disaster management structures.

Study context

This rapid assessment covered two of the most climate-exposed divisions—Barishal and Sylhet—to assess how extreme weather events affect learning continuity among students in government primary schools. These two regions represent contrasting ecological and climatic zones: Barishal, a coastal deltaic region frequently hit by cyclones and tidal surges, and Sylhet, a northeastern division dominated by haor wetlands and flash-flood-prone river basins (BBS, 2023). The study sites selected 16 of the most affected upazilas in Barishal and Sylhet division (*See*: Table 1). These areas are frequently affected by seasonal floods, cyclones, and salinity intrusion, which significantly disrupt school operations and student attendance (Department of Disaster Management [DDM], 2022). Barishal represents the persistent challenges of coastal cyclone-prone schooling environments, while Sylhet demonstrates the equally severe yet distinct pressures of inland flood vulnerability.

In Barishal Division, most communities depend on agriculture, fisheries, and coastal livelihoods that are highly sensitive to climatic shocks. Cyclones and tidal floods, such as Sidr (2007), Aila (2009), and Remal (2024), have repeatedly destroyed school infrastructure and educational materials, forcing

many institutions to operate as temporary shelters (UNICEF, 2024a; 2024b; 2024c). The overall literacy rate in Barishal's affected upazilas averages 77.0%, with participation in organised learning at 58.3%. However, significant disparities exist between districts—literacy is higher in Pirojpur (84.9%) and Barguna (80.0%) but notably lower in Bhola (66.5%), which can sometimes be inaccessible. Barishal's poverty rate, measured using the upper poverty line, stands at 26.9% against the national average 18.7%, indicating substantial socioeconomic vulnerability (BBS, 2022). Such economic fragility compounds the impacts of disasters: livelihood losses force families to withdraw children from school or delay their return after floods. Damage to roads, classrooms, and sanitation facilities further constrains attendance and learning outcomes, especially in remote coastal areas (Save the Children, 2023; Education Watch, 2020).

Table 1: Study sites

Division	District	Sub-district	Impact of Crisis	No. of school affected by disaster	Participation in organised learning (4.2.2)	Literacy Rate (5+ age group)
Barishal	Pirojpur	Mathbaria	3	14	60.0	84.9
		Zianagar	3.6	38		
	Barguna	Barguna Sadar	3.4	57	61.9	80.0
		Amtali	2.8	106		
		Patharghata	3.1	18		
	Patuakhali	Galachipa	2.6	74	55.1	75.9
		Kalapara	2.6	74		
	Bhola	Charfashion	3	16	53.7	66.5
	Overall		-	-	**58.3**	**77.0**
Sylhet	Sunamganj	Chhataka	4.3	45	43.4	63.6
		Dowarabazar	2.8	33		
		Sunamganj Sadar	1.9	37		
		Shalla	1.5	48		
	Sylhet	Kanaighat	2.5	27	50.5	75.4
		Companyganj	2.8	74		
		Osmaninagar	3.7	39		
	Moulavibazar	Baralekha	3.2	54	54.5	75.0
	Overall		-	-	**48.7**	**71.0**

In contrast, Sylhet Division presents a different climate vulnerability profile. The haor and lowland ecosystems experience recurrent flash floods during the pre-monsoon and monsoon seasons, submerging schools and isolating communities (Islam et al., 2022). Upazilas such as Shalla, Kanaighat and Companiganj are particularly exposed, with classrooms often inaccessible for weeks. Overall, the division reports an average literacy rate of 71.0% and participation in organised learning of 48.7%, both below national averages. Sub-district data indicate lower literacy in Sunamganj (63.6%) and higher levels in Sylhet (75.4%) and Moulavibazar (75.0%). Although Sylhet benefits from significant remittance inflows, its poverty rate of 17.4% (BBS, 2022) conceals the persistent deprivation in flood-affected haor communities, where infrastructure damage, transport inaccessibility, and income shocks result in chronic absenteeism and learning loss (Rahman & Hossain, 2021).

The study pursued four main objectives: (1) to determine the effects of extreme climate events on school operations, education access, and disability inclusion; (2) to assess the status of social-emotional learning, well-being, and foundational literacy and numeracy (FLN) in affected schools; (3) to identify coping strategies used by schools, teachers, and students; and (4) to document best practices for building climate-resilient education systems at school and community levels. Additionally, this study seeks to provide recommendations for policymakers to strengthen climate-resilient education strategies in Bangladesh.

METHODOLOGY

The study followed a convergent parallel mixed method research design to capture both quantitative and qualitative dimensions of how extreme climate events affect learning continuity in Bangladesh. This approach enabled the research team to collect and analyse quantitative and qualitative data simultaneously, allowing the results from one strand to complement and validate the other. Quantitative information generated measurable evidence on school operation, access, disability status, learning outcomes, attendance, and well-being, while qualitative data provided in-depth understanding of teachers' and students' lived experiences regarding educational access, disability inclusion, school-level responses to climate events, and contextual variations. Together, they offered a comprehensive and triangulated picture of the complex ways in which climate shocks disrupt education systems.

Research was conducted in two of the most climate disaster-affected divisions— i) Barishal and ii) Sylhet to reflect contrasting ecological contexts: Barishal represents the coastal and cyclone-prone south, while Sylhet captures the haor (water-logged) region that experiences recurring flash floods and riverine inundation. Within these divisions, the study covered the most impacted 7 districts and 16 upazilas identified by the Need Assessment Working Group (NAWG) and UNICEF Situation Reports. The number of affected schools in that area was another consideration for inclusion of those areas in sample list. In the next stage, the Directorate of Primary Education (DPE) field offices provided a list of 83 government primary schools most severely affected by recent disasters 41 from Sylhet and 42 from Barishal divisions (*See*: Annex I for more details). Schools were selected based on the level of exposure and reported disruption. From each school, approximately 28 students from Grades 3 to 5 were randomly selected, ensuring an equal proportion of boys and girls, for a total of 2273 students. Additionally, 83 head teachers and 222 assistant teachers (one from each of the selected grades) were included from each of the sample schools. Finally, 7 districts and 16 upazila education officers for the sample areas were interviewed to obtain system-level perspectives. The final sample thus represented diverse geographic and demographic profiles, balancing rural, urban, and remote contexts.

Multiple data sources and instruments were used to collect the relevant data. For students:

- Demographic data were captured with a student questionnaire that collected data on socio-economic background, home literacy environment, attendance, disability status using Washington Group questions, and well-being scales adapted from existing IRC-ERICC pilot tools (*See*: Annex II for more details).
- Assessments were conducted using the ASER Plus reading and numeracy tools, which measured literacy and numeracy competencies at five progressive levels—from letter recognition to comprehension in Bangla and from single-digit operations to division in numeracy.

- Social and emotional learning (SEL) was captured through the Holistic Assessment of Learning and Development Outcomes (HALDO) tool, developed by Save the Children and contextualised for Bangladesh using interactive photo and story-based tasks focused on empathy, perseverance, and self-concept.

Teacher and head teacher surveys gathered quantitative and qualitative data on school operation, education access, teachers' stress, well-being, classroom challenges, and adaptation strategies. For example, the teacher stress inventory (Boyle et al., 1995) rated stress levels across a 0–4 scale, while open-ended items captured narratives on disaster preparedness, teaching constraints, and post-disaster recovery practices (see Annex III for more details). Semi-structured interviews with head teachers and education officers explored institutional preparation and responses, the implementation of Education in Emergency (EiE) plans, and coordination mechanisms between schools, communities, and local authorities (*See*: Annex IV for more details). All tools were contextualised for Bangladesh, translated into Bangla, and pre-tested before final administration.

Field implementation was carried out by trained enumerators organised into teams of four per school. Prior to data collection, a three-day intensive training was conducted covering study objectives, ethical considerations, child safeguarding, tool administration, and use of Kobo Toolbox for digital data entry. Enumerators practiced the instruments through a one-day pilot exercise in two government primary schools near the training venue, which helped refine question phrasing and sequencing. During data collection, each school visit lasted one working day, during which enumerators conducted one-on-one student assessments, teacher and head teacher interviews, and observations of the school environment. Data were then exported into SPSS for quantitative analysis. Descriptive and inferential statistics, including frequency distributions and cross-tabulations, were used to identify patterns and relationships by divisions, gender, and disability status. Qualitative data were transcribed, cleaned, and coded thematically following the Braun and Clarke (2013) framework. Repeated readings of the transcripts allowed researchers to identify recurring concepts and patterns, which were then grouped into broader themes aligned with the research objectives. The results from quantitative and qualitative analyses were later triangulated to produce an integrated understanding of the effects, coping mechanisms, and best practices on climate-related impacts on learning continuity observed across contexts.

To maintain data quality and reliability, several data quality assurance measures were integrated throughout the process. Pilot testing of instruments ensured contextual and linguistic appropriateness, while inter-rater reliability checks during data collection verified consistency between enumerators. Supervisors performed spot checks, continuously reviewed data entries for accuracy and completeness, monitored adherence to protocols, and conducted daily debriefing sessions to ensure uniformity and accuracy across field teams. Further phone calls, WhatsApp group communication between teams and centralised monitoring further enhanced standardisation across sites.

All data were handled in accordance with strict data management and ethical protocols. Identifiers were removed to preserve anonymity, and access to raw data was restricted to the core research team. Digital records were securely stored in an online platform, in compliance with IRC data protection policy. Overall, the methodological rigor and quality control measures ensured that the study generated reliable, valid, and contextually grounded evidence on the impact of extreme climate events on learning continuity in Bangladesh.

1. THE EFFECTS OF EXTREME CLIMATE EVENTS ON SCHOOL OPERATIONS, EDUCATIONAL

ACCESS, AND DISABILITY INCLUSION

1.1 On educational access

The study reveals that extreme climate events have a substantial and multi-layered impact on educational access in Bangladesh, with clear regional disparities, household-level vulnerabilities, and climate-specific barriers shaping students' ability to attend and remain in school. Data from other sources (UNICEF, 2024a; 2024b; DPE, 2024; BBS, 2022) noted that many damaged schools became completely unusable, with collapsed roofs, broken windows and doors, submerged classrooms, destroyed WASH facilities, and learning materials such as textbooks, furniture, and electronics were washed away by climate events that further obstructs students from accessing school. This assessment identified various factors such as school infrastructure, condition of connecting roads, availability of transport and teaching-learning materials, socioeconomic constraints (e.g., involvement in household chores or income-generating activities), and physical access facilities for students with functional difficulties that determine students' access to schools, which is often hampered by climate events.

Data from this assessment found a high rate of absenteeism after extreme climate events due to access barriers. These absences, though temporary for many, frequently stretch into weeks or months as families rebuild homes, replace learning materials, or restore livelihoods. According to the findings, approximately one-third of students remained absent after schools reopened, with Sylhet reporting a higher absenteeism rate (37.7%) than Barishal (30.0%). Boys were slightly more absent (34.6%) than girls (32.5%). Absenteeism declined by grade level: Grade 3 recorded the highest rate (38.6%) followed by Grade 4 (32.5%) and Grade 5 (31.3%). Students with functional difficulties had an absenteeism rate nearly two and a half times higher than their peers, students without functional difficulties, indicating that climate impacts disproportionately affect vulnerable learners.

Teachers and head teachers described that the transition from temporary absence to permanent dropout represents one of the most concerning consequences of extreme climate events. According to head teachers, an average of 14.6% of students permanently drop out following major disasters, primarily due to economic hardship and displacement. The dropout rate is notably higher in Sylhet (16.5%) than Barishal (11.3%) reflecting the prolonged school closures and severe flooding in Sylhet's affected area.

Further, according to the teachers, material loss was a significant barrier to access, mentioned by half of all respondents. Textbooks, notebooks, and schoolbags were frequently washed away. Parents with low incomes could not afford replacements, leading to shame, frustration, and prolonged absenteeism. "When their books are lost, many students stop coming. They feel embarrassed sitting empty-handed. Some parents said, 'Let them rest until new books come.' That 'rest' sometimes means they never return," said a head teacher from Barishal.

In Sylhet, flooding is the main cause of absenteeism. Data from this assessment shows that floods and road damage frequently make schools physically inaccessible, particularly for younger children and students with disabilities. According to the BBS (2022), around 45% of the children in Sylhet remained absent from school due to this transportation and accessibility disruption. In many remote haor areas, students are forced to cross knee- or waist-deep water, discouraging regular attendance. As one teacher from a haor school of Sylhet described, "When the water rises, sometime no boats are not available to cross. Students often swim halfway, carry schoolbags on their heads."

In Barishal, post-cyclone fatigue and discomfort during extreme heat reduce motivation. Children cite illness (around 52%) and household chores (45%) as the common barriers to access post-disaster. According to BBS (2022), sickness or injury was identified as the main reason (72%) of remaining absent in school after disaster.

Our assessment indicates that girls are more likely to miss school due to household chores, e.g. sibling care (29.5%) and safety concerns (12.4%), whereas boys report income-earning responsibilities (20.3%) more often after climate events to support their families. Regional and gender variations further complicate the picture. In Sylhet, boys are more often withdrawn from schooling to work, while in some Barishal communities, boys remained absent due to income generation and losing interest in education. In contrast for girls, in Sylhet girls remained absent due to transportation problems, safety concerns, and household chores, and in Barishal safety concerns and early marriage pressures push girls out of school. These findings align well with previous studies which show that girls in coastal areas face educational barriers due to early marriage and heavier household workload and face elevated dropout risk link to climate impacts (IRC, 2023; Islam et al., 2021). Further, boys engaging in income-generating activities post-disaster have also been found in previous studies. For example, Farid et al. (2021) reported that post-disaster, the local economy of the affected regions gets disrupted, and for survival, poor and affected families have to engage their children in income-related activities.

Data from headteachers, teachers, and education officers supports these findings. More than 80% of headteachers and all education officers identified financial strain as the leading cause of post-disaster dropout, followed by family migration, damaged transportation networks, and poor health. They also noted that low-income children were most at risk, identified by 80% of headteachers and 93% of education officers as the most likely to drop out. Regarding gender, both headteachers and education officers reported that boys face a higher risk of dropout than girls in post-disaster contents. Although students with disabilities were perceived by school authorities (teachers and officers) as a comparatively lower-risk group, student-level data reveal a contrasting pattern. Student level data show that the dropout rate among students with disabilities reached 16.9%, more than double that of their peers without disabilities (7.1%, see next section for a full discussion). Similarly students not living with their parents exhibit elevated dropout rates (13.9%). Children living in extended families also experience higher dropout, consistent with the burden-sharing and resource dilution dynamics observed after disasters.

In sum, the findings reveal a multifaceted pattern of education access shaped by geographical location, gender, and disability status. Students in flood-prone divisions, particularly Sylhet, face the greatest obstacles to attending school, compounded by disability, poverty, and family structure. Flooding and cyclones disrupt physical access to schools, while heatwaves erode concentration and motivation even when schools remain open. Gender challenges showed that boys are often pulled into income-generating activities, whereas girls miss school due to household responsibilities or safety concerns during and after climate events. Children with disabilities face the greatest constraints, including damaged roads, lack of accessible transport, and inaccessible or damaged physical facilities. Temporary absences after climate events frequently evolve into permanent

dropouts, driven by economic distress and displacement. These patterns clearly demonstrate that climate shocks disproportionately affect already marginalised groups, underscoring the need for targeted, equity-focused strategies rather than uniform responses to address the educational impacts of climate change.

1.2 On disability inclusion

There have been numerous national policies to facilitate the inclusion of children with disabilities in the education system. The *National Education Policy (NEP) 2010* defines categories of disabilities as blindness, deafness, dumb, and/or physically or mentally handicapped, categorised by severity as mild, semi, or acute. The policy states that children with mild to moderate disabilities can participate in mainstream education with accommodations, while those with severe disabilities should receive specialised education (Ministry of Education, 2010). The NEP 2010 also includes provisions for accessible sanitation in schools to meet the needs of learners with physical disabilities. The Ministry of Primary and Mass Education (MoPME) has drafted policies requiring ramps in all new government schools and has developed designs for accessible school latrines. However, implementation has faced challenges, including slow construction, insufficient funding, and weak enforcement of building codes. Finally, the Primary Education Development Programmes (PEDP3 and PEDP4) introduced components to improve school environments and infrastructure, resulting in some progress in gender-appropriate and disability-accessible facilities, sanitation, and furniture (UNICEF, 2021).

Despite accommodations in national legislations, data on school participation among children with disabilities in Bangladesh remains limited. Data on children with disabilities in schools can be found from two primary sources. The *Multiple Indicator Cluster Survey (MICS) 2025* reports that around 5.7% of children aged 5–17 experience at least one functional difficulty. Regional variations are notable– Barishal shows one of the lowest prevalence rates nationally at 4.7%, whereas Sylhet record the highest rate at 9.5% (BBS & UNICEF, 2025).

Our analysis of disability inclusion across climate-affected schools in Barishal and Sylhet reveals that while the overall prevalence of functional difficulties among students appears low in percentage terms, the issue is far from negligible when translated into real numbers (73 children out of 2273 children assessed). Approximately 3.2% of students reported at least one functional difficulty as measured by the Washington Group Short Set (WG-SS), with about 0.6% reporting multiple difficulties. The most frequently reported challenge relates to cognitive functioning (1.8%), followed by communication and physical difficulties (0.7% each), while visual, hearing, and self-care difficulties were less commonly mentioned.

Differences across groups are small overall, though the small number of children with disabilities in the sample limits the depth of disaggregated analysis. In our assessment, the prevalence of functional difficulties appears similar across division–3.3% in Barishal and 3.1% in Sylhet, despite the substantial regional differences reported in MICS 2025. A likely explanation is that many children with functional difficulties were not captured in our sample because the assessment only included students present at school on the day of data collection. Given the high absenteeism rate on the assessment day (34%), it is highly probable that additional children with functional difficulties were absent and therefore excluded from the assessment. Furthermore, direct comparisons between school-based data and household-level surveys are inherently challenging, as not all children identified at the household level are necessarily enrolled in or attending school at the time of assessment.

Gender differences in the reporting of functional difficulties are small but statistically significant ($p<0.04$), and therefore warrant attention from a programmatic perspective. Boys reported slightly higher rates (4%) of functional difficulties than the girls (2.5%) and these distinctions highlight the need for gender-sensitive inclusion approaches. This pattern is consistent with findings from MICS 2025, which also reported higher prevalence among boys (5.5 percent) than girls (4.9 percent) (BBS & UNICEF, 2025). However, neither MICS 2025 nor the present assessment examined the combined effect of gender and functional difficulties on learning exclusion. This represents an important evidence gap, suggesting the need for further research and targeted policy analysis to understand intersectional vulnerabilities and inform inclusive education strategies.

The most significant and policy-relevant finding, however, lies in the relationship between disability

and household poverty. The data reveal a strong and statistically significant socio-economic gradient ($p<0.001$). The share of students reporting with functional difficulty rises from 1.4% in the richest tercile to 8.2% in the poorest tercile, while the incidence of multiple difficulties is concentrated overwhelmingly among the poorest. This relationship likely reflects both true differences in exposure and the protective effect of resources. Literature shows that poor families are more likely to live in hazard-prone environments, e.g., embankments, low-lying haors, or fragile coastal zones, and to have limited access to nutrition, healthcare, and rehabilitation services. As a result, climate-related injuries, infections, or malnutrition can exacerbate existing conditions or reveal hidden disabilities (ESCAP, 2018; World Bank, 2019; WHO & World Bank, 2011). Conversely, wealthier households may have access to assistive devices, stable housing, or private transport that mask or mitigate functional limitations, leading to underreporting among these groups (UNICEF, 2021; WHO, 2018).

The intersection of disability and poverty has direct implications for educational access during climate crises. Previous studies show that children with disabilities in low-income groups face the steepest barriers to returning to school after disasters. Physical access routes often remain damaged or submerged; classrooms serving as temporary shelters may lack accessibility; and school reopening communications are rarely designed for children with cognitive or communication difficulties (Chowdhury et al., 2025; CDD & CBM, 2022). Children with cognitive or communication difficulties are often the first to struggle when schools close, relocate, or modify schedules during emergencies. They find it harder to adapt to rapid changes, comprehend new routines, or respond effectively to safety instructions. Though these proportions may seem minor, at a national scale they represent thousands of learners across affected districts who face distinct barriers to participation and learning—barriers that tend to become more severe during climate disruptions.

Our data further point to a layered disadvantage that goes beyond physical accessibility and directly affects students' engagement, concentration, and overall learning experiences. More than 80% of children with functional difficulties reported that floods or cyclones had disrupted their attendance, compared with 68% of children without functional difficulties ($p<0.023$). Similarly 61.6% of children with functional difficulties stated that extreme heat impaired their concentration, whereas 44% of children without functional difficulties reported the same ($p<0.000$). More than half (54.8%) of children with functional difficulties also noted that heat reduced their willingness to attend school, compared to 39% of children without functional difficulties ($p<0.000$). In all these cases, children with functional difficulties faced more challenges or unwillingness due to extreme climate events. These compounded disadvantages help explain the higher rates of irregular attendance (23.4% vs. 9.7%) and dropout (16.9% vs. 7.1%) observed among students with functional difficulties. The resource gradient effectively magnifies the exclusion risk, meaning that children with disabilities in poor families are both the most exposed and the least supported during recovery.

At the operational level, these findings underscore several practical challenges that schools and communities face in ensuring disability inclusion during and after climate emergencies. Studies show that students with cognitive or communication difficulties struggle most with evacuation and re-entry phases when sudden changes in routine and environment can cause confusion and distress. Without visual schedules, peer assistance, or designated support adults, these students are often among the last to return to regular classes once schools reopen. Even minor mobility impairments become major obstacles in the aftermath of floods or cyclones, when roads, schoolyards, and stairways remain damaged or waterlogged. Moreover, temporary classrooms—often noisy, crowded, and poorly ventilated—further exacerbate concentration difficulties for children with cognitive or sensory challenges (CDD & CBM, 2022; GFDRR, 2021; C3ER, 2021; Dhaka Tribune, 30 October 2025).

While the majority of students identified with functional difficulties in this assessment reported cognitive impairments, inclusive physical infrastructure remains a critical enabling factor for access, safety, and participation–particularly in climate-affected contexts. Although PEDP4 and national guidelines call for inclusive infrastructure such as ramps, wide doorways, non-slip flooring, accessible

WASH blocks, and barrier-free evacuation routes, many schools still lacked these essential features in practice. Field observation found that poor infrastructure and harsh environments severely restrict access for children with disabilities in climate-affected areas. Flooded and broken paths, broken stairs, and elevated classrooms without ramps make schools physically inaccessible, while vulnerable structures and overcrowded shelters create sensory and safety challenges. Even in schools where new buildings included ramps, the designs were often non-functional. For example, one school in the Barishal region had a newly constructed three-story cyclone-resilient building with a ramp, but the ramp entrance was located at the back and completely blocked, and no classrooms were located on the ground floor. As a result, children with mobility difficulties could not access classrooms during normal conditions, let alone during emergencies. Consequently, during floods or cyclones, these children are often the first to drop out and the last to return, lacking both mobility support and inclusive evacuation plans. Observation reveals that without accessible infrastructure, safe routes, and inclusive design, climate vulnerability directly translates into educational exclusion for children with disabilities in extreme climate schools.

The effect of extreme climate events on children with disabilities suggests that inclusion should be integrated into the national education and disaster-response framework with tailored strategies that reflect the distinct hazard profiles of Sylhet and Barishal. In flood-prone haor regions, inclusion requires accessible evacuation routes, pre-positioned safe transport, raised pathways, and temporary learning spaces that accommodate mobility and sensory needs. In cyclone-exposed coastal areas, resilient school infrastructure, debris-free access paths, and inclusive shelters are essential to ensure safe return and continuity of learning. Across both contexts, multi-modal early-warning messages for clear communication, predictable routines, accessible infrastructures, appropriate assistive tools, accessible evacuation drills, teacher capacity to support children with cognitive or communication difficulties, and minimum accessibility standards for temporary classrooms are critical. Integrating these into school safety plans nationwide would ensure that students with disabilities are not only able to evacuate safely but can also resume schooling quickly.

Photo: A flood resilient school in Sylhet with accessibility issues. (Photo taken by: Tasrina Mahpara from Shalla, Sunamganj).

School instructional time

In recent years, Bangladesh has experienced multiple rounds of school closures due to climate-related hazards. For instance, in 2024, over 35 million learners were affected by climate-related education disruptions, with heatwaves causing the most significant interruptions (UNICEF, January 2025). In April and May 2024, extreme heat pushed temperatures to 43.8°C, forcing nationwide school closures for more than two weeks to protect students and staff from the potential health impacts of

rising temperatures (UNICEF, 2024a; 24 January 2025). It was the first time the country experienced such a large-scale nationwide school closure.

Photo: A government primary school in Sylhet that had difficulty to continue during extreme heat. Photo taken by: Mamotaz Jahan from Kanaighat, Sylhet.

Findings from this rapid assessment show that extreme heat events make it difficult to attend school for both teachers and students. Nearly half of the students in Barishal and about 41% in Sylhet reported difficulty concentrating in class due to excessive heat, while around 40% in both divisions stated that high temperatures lowered their motivation to attend school regularly. Teachers similarly described severe operational challenges, noting that classrooms—especially those with tin roofs, poor ventilation, and no electricity or cooling facilities—become unbearable during hot months. To cope, many schools shorten class hours or shift to early morning sessions, but in extreme cases, they must close entirely. As one head teacher from Barishal explained, "The tin classrooms become like ovens during the hot months. Students faint, and we must close school early." These findings highlight how rising temperatures are not only shortening the academic calendar but also eroding the overall quality and continuity of education in heat-prone regions of Bangladesh.

The heatwave was followed by successive and compounding climate shocks that further deepened the disruption of education across Bangladesh. Cyclone Remal in May and severe flooding between June and August exacerbated the crisis, damaging school infrastructure, displacing families, and forcing prolonged school closures in several districts. According to UNICEF (January 2025; 24 January 2025), the floods affected 18.4 million people, including 7 million children, with Sylhet district suffering the greatest impact where over 600,000 learners were cut off from education due to inundated classrooms and damaged access roads.

Photo: A flood-affected school in Sylhet that remains completely unusable until the water recedes. Photo taken by: Md. Abdul Awal, Companiganj, Sylhet.

These events reinforced an ongoing pattern of climate-related education disruptions that have become annual occurrences in many parts of the country. For instance, the catastrophic 2022 floods in the northeast haor belt (Sylhet–Sunamganj) inundated at least 810 government schools, while nearly 500 were repurposed as flood shelters which suspended classes, diverted teachers to relief roles, and delayed reopening and syllabus completion. Similarly, in the coastal south, thousands of schools were forced to close or operate as emergency shelters by repeated cyclones over the last decades e.g. Roanu (2016), Fani (2019), Bulbul (2019), and Remal (2024).

Data from this rapid assessment revealed that climate-related school closures are now an annual or near-annual phenomenon. According to the school calendars of the two education ministries in Bangladesh, schools remain open for 185 days in a year after accounting for weekends and holidays; however, climate-related events make the instructional days even shorter. More than 90% of sample schools in Barishal and Sylhet divisions reported losing instructional days due to disasters. Flooding and cyclones caused prolonged closures due to damaged classrooms, the use of schools as temporary shelters for displaced communities, and disrupted communication between schools and students. The total number of academic days lost over the year varied widely by disaster type. In flood-affected areas of Sylhet division, schools lost nearly 29 days on average (16% of instructional days, ranging from 7 to 90 days), while Barishal lost about 15 days (8% of instructional days, ranging from 1 to 35 days) due to cyclones and extreme heat.

This aligns with data from previous years, which show that nationally, in 2021, children aged 5–17 missed an average of 17 school days annually due to disasters, though the number varied widely by region. Flood-affected areas experienced the highest absenteeism–Mymensingh missed an average of 25 days, followed by Rangpur (23 days) and Sylhet (21 days)–while cyclone-affected regions such as Khulna and Barishal recorded a lower average of about 9 days of absence. Further, this aligns with what households have reported. In Sylhet division about one-third of students were absent from school for 16–30 days or

Photo: A school managing learning activities in a broken classroom affected climate events in Shalla, Sunamganj. Photo taken by: Mohaiminul Islam.

longer, whereas in Barishal the proportion of students absent for an extended period was comparatively lower (5.4%) (BBS, 2022).

Interviews with teachers and officers explained the reason for Sylhet's extended disruption lies in its geography, as water stagnation in the haor basin delays the recession of floodwaters, making it difficult for schools to reopen even after the immediate event passes. Teachers and students often face challenges reaching the school due to submerged access roads. In Barishal, by contrast, schools usually reopen sooner after cyclones once debris is cleared and minor repairs are completed.

In addition to this, the use of schools as emergency shelters extends the interruption of teaching. Across both divisions, around 60% of sample schools function as cyclone or flood shelters during extreme events, with the proportion being slightly higher in Barishal. This practice is lifesaving for local communities but imposes a serious operational trade-off. Stakeholders reported in the assessment that when classrooms are used to accommodate displaced families, furniture and learning materials are damaged, sanitation facilities are destroyed, and reopening is delayed until evacuees can safely leave. Although essential for humanitarian response, the shelter function of schools effectively transforms a short-term natural disaster into a potential longer-term educational disruption. Farid et al. (2021) found similar findings and reported even schools that are not affected by a flood are generally used as flood shelter for the affected people. This causes additional loss of school time for the students. The findings call for policy attention to the establishment of dedicated "education-safe zones" or temporary learning spaces within shelter-designated schools, so that education can resume even during extended emergencies.

Infrastructure damage

The extent of physical damage to school infrastructure is another key indicator of operational vulnerability and has been found in other research to disrupt school operations (BBS, 2021; BANBEIS, 2024). In 2024 alone, 84.3% of sample schools reported some level of damage caused by extreme weather, with Barishal recording a significantly higher rate (92.9%) than Sylhet (75.6%; p=0.031). This difference aligns with the nature of local hazards: wind and tidal surges in the coastal areas caused visible structural destruction such as roof and boundary wall collapse, whereas flooding in the haor region of Sylhet led primarily to waterlogging and material deterioration. The most frequently affected components included damage of floors (85.7%), classrooms (83%), toilets (73%), and access roads to school (67%). Although access roads are not part of the school infrastructure itself, their damage critically hampers school operation by disrupting the mobility of teachers and students and limiting overall access to education.

On average, each sample school had about 4 classrooms, of which only two were in good condition. Approximately half of these classrooms were partially damaged or unusable. This shortage of safe, functional space forces teachers to conduct multi-grade or shift-based teaching, often in overcrowded and poorly ventilated rooms. The loss of physical space, therefore, translates directly into reduced instructional time and diminished teaching quality. The problem is especially acute in Sylhet, where floodwater often makes some classrooms inaccessible for weeks, compelling teachers to merge classes or teach from elevated verandas.

The ripple effects included delays in syllabus completion, extended academic calendars, and irregular assessments. Teachers and education officers repeatedly emphasised the difficulty of managing the academic year under such conditions. One head teacher from Barguna noted, "After every cyclone, we lose not just classrooms but the rhythm of teaching. Even when we reopen, it takes weeks for children to concentrate again." Similar sentiments were echoed in Sylhet, where teachers described having to conduct combined classes with different grades due to damaged rooms and staff shortages.

Teacher shortages

The human resource dimension of operational disruption is equally important. Nearly one in five schools (19.3%) experienced teacher attrition linked to extreme weather events—slightly higher in Sylhet (23.8%) than in Barishal (14.6%). All head teachers who reported teacher attrition confirmed that it had a negative impact on students' learning and performance. Both teachers and education officers noted that a significant portion of the teachers at the sample schools live in urban areas and they cannot attend school on regular basis during disaster months as roads are submerged and transport is not consistently available. Additionally, when local teachers move to other places during the disaster period due to damaged housing, transportation barriers, or family displacement, schools lose not only instructional capacity but also leadership continuity. In Sylhet, among the 41 sample schools, 8 schools had only two assistant teachers, while 3 schools had just one assistant teacher. Similarly, in Barishal, among 42 sample schools, 6 schools had only two assistant teachers, and 2 schools had only one assistant teacher, who had to manage all classes from pre-primary to Grade 5.

Moreover, teachers tend to transfer out of the disaster-affected school to non-affected schools. These findings highlight the fragility of human capital within climate-vulnerable school systems and significantly compounded operational difficulties. As one head teacher from Sylhet explained,

> *"I worked for around 12 years in X school that was repeatedly exposed to floods, and I suffered every year. I tried several times to get transferred, and when I was finally promoted as head teacher, I managed to move. Usually, teachers do not want to go to that school because they know the hardships."*

Thus, disaster-affected schools in remote areas suffer from teacher shortage and have to compromise on teaching-learning quality.

A remote haor school in Shalla struggling with teacher shortages and months of flooding

Access to the school in Shalla upazila is a challenge due to its location. While classroom activities were not stopped due to flooding or any other disaster in last 12 months, approximately 60% of students were not able to attend school for a long period of time during the flood in rainy season (the school is located in hoar area). Indeed, many students came to school by swimming. Further, there is no distance learning or communication support for these students.

The head teacher also acknowledged that they could not address their learning gap for all students as there was severe teacher shortage in that school. Teacher shortage is one of the most primary concerns of this school as they had only two teachers, including an acting head teacher. There were more than 100 students. The headteacher shared that they face difficulties in managing the students with only two teachers. Two teachers left this school because of transportation issues.

2. STATUS OF SOCIAL-EMOTIONAL LEARNING, WELL-BEING, AND FOUNDATIONAL LITERACY AND NUMERACY IN CLIMATE-AFFECTED SCHOOLS

Our findings show that extreme climate events disrupt learning, social-emotional well-being, and foundational skills in primary schools across Barishal and Sylhet. While students demonstrate strong perseverance, empathy, confidence, and overall well-being, these skills remain fragile, especially among girls and children with disabilities. Foundational literacy and numeracy are also low, with

nearly half of students below basic reading and numeracy proficiency. Head teachers, class teachers, and education officers consistently reveal that floods, cyclones, and prolonged heatwaves have created enduring disruptions to the holistic learning environment of primary schools. These recurring climate events have fundamentally disrupted the rhythm of teaching and learning, reducing classroom time, delaying syllabus coverage, and weakening both student motivation and teacher engagement.

2.1 Status of social-emotional learning (SEL) and well-being in climate-affected schools

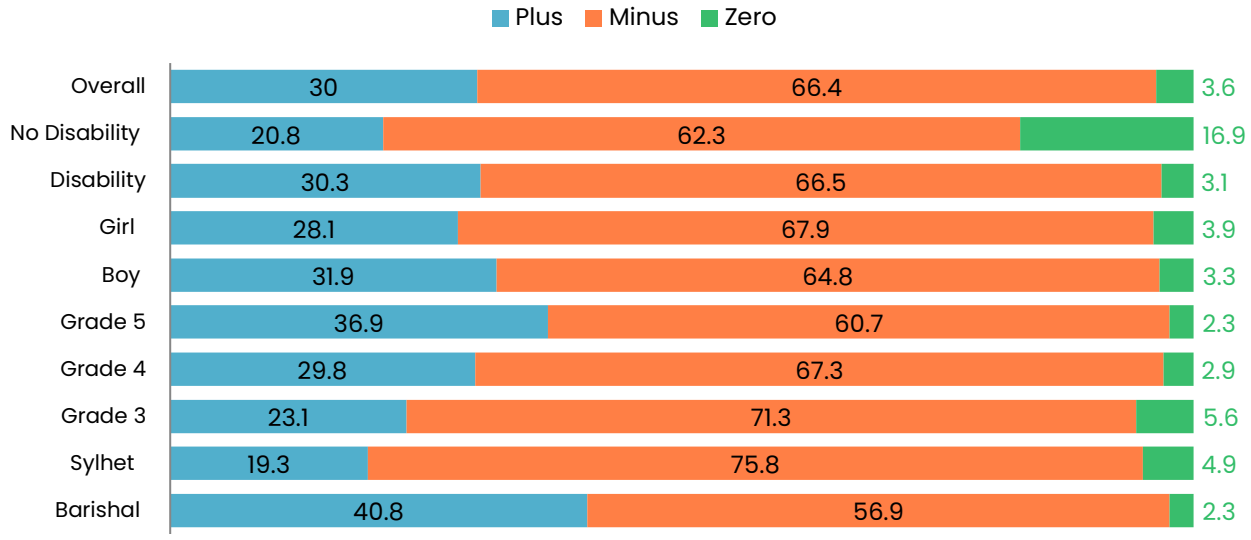
2.1.1 Status of students SEL and well-being

Our assessment of students' social-emotional learning (SEL) and well-being reveals that while children in disaster-prone regions demonstrate remarkable perseverance, their empathy, self-concept, and overall emotional health remain fragile and uneven. It illustrates how repeated exposure to climate disruption has weakened children's emotional resilience and social connectedness, particularly in Sylhet and among students with disabilities.

Empathy levels were notably low across the sample (see Figure 1). While only 30% of students demonstrated plus level empathy, the regional disparity was stark ($p<0.000$): 40.8% of students in Barishal showed plus level empathy compared to just 19.3% in Sylhet. This difference may reflect the longer school closures and isolation in flood-prone areas, where reduced interaction with peers and teachers limits opportunity for developing social awareness and compassion. Differences by grade were also significant ($p<0.000$) and support this idea of the peer relationship effect: 23.1% of Grade 3 students demonstrated plus level empathy compared to 36.9% of Grade 5 students, suggesting that increased time in school and greater peer engagement contribute to strong socioemotional development.

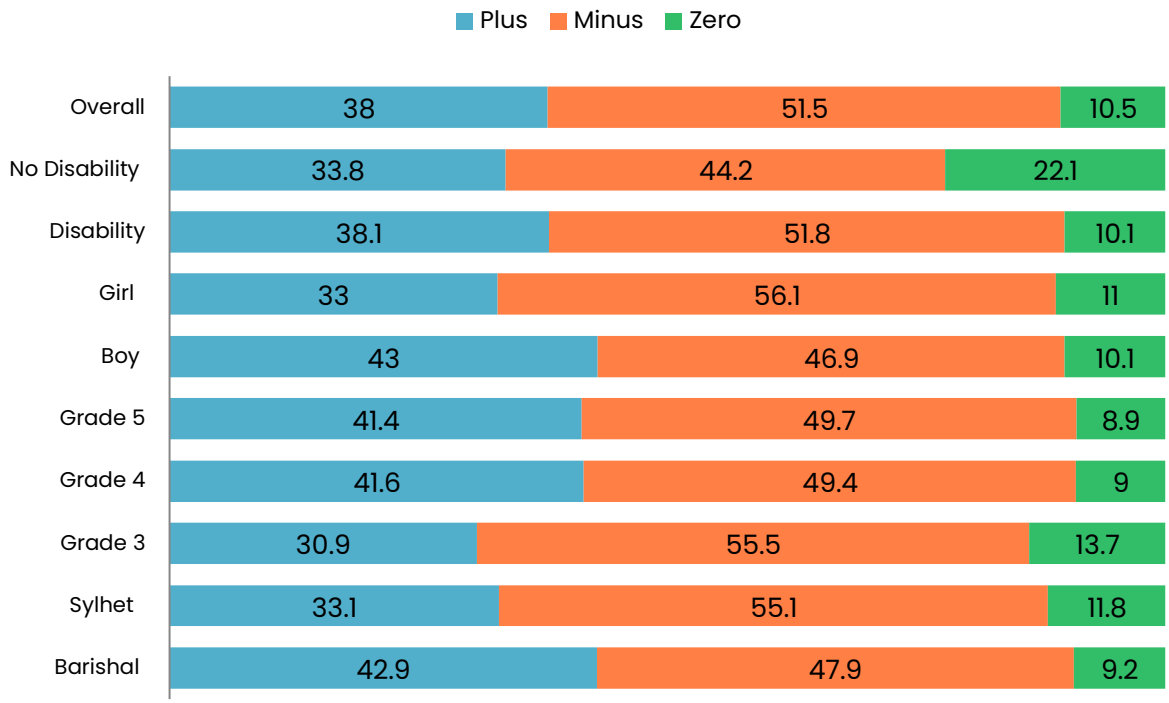
For children with functional difficulties, the challenge was more pronounced ($p<0.000$): 16.9% recorded zero empathy levels compared to only 3.1% of children without functional difficulties, while 20.8% demonstrated plus level empathy versus 30.3% among their peers without functional difficulties—indicating both higher emotional withdrawal and lower socioemotional resilience. No significant difference was observed by gender ($p<0.122$).

Figure 1: Percentage of children's demonstrated empathy level by group



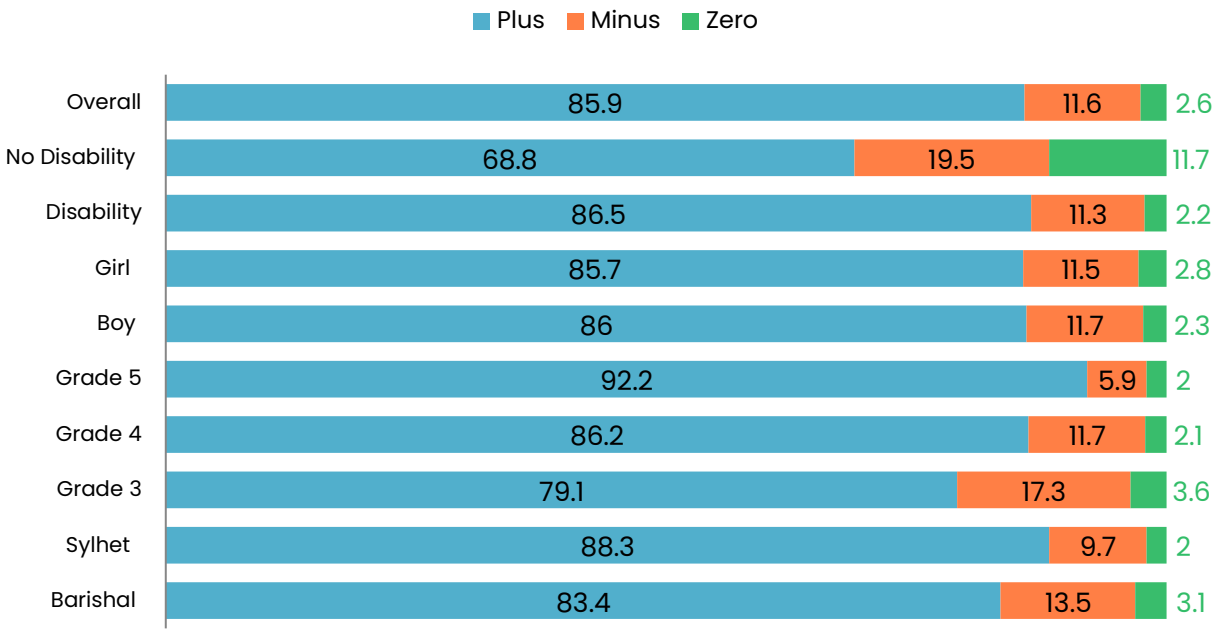
Self-concept presented an equally concerning picture (see Figure 2). Only 38% of students reported plus level self-concept regarding their future prospects, while more than half expressed doubts about their own ambition and potential. The disparity between regions was again evident ($p<0.000$): 43% of Barishal students had a strong self-concept compared to 33% in Sylhet. Gender differences were also significant ($p<0.000$), with boys reporting greater self-concept (43%) than girls (33%). Among students with functional difficulties, the lack of self-concept was particularly pronounced ($p<0.003$): 22% fell into the zero self-concept category, compared to 10% of their peers without difficulties. These findings suggest that children in prolonged crisis-affected areas, as well as girls and students with functional difficulties, are especially vulnerable to diminished self-concept.

Figure 2: Percentage of children's demonstrated self-concept level by group



In contrast, perseverance emerged as a notable strength (Figure 3). Across all schools, 85.9% of students demonstrated plus level perseverance—an indicator of determination and adaptability. Interestingly, Sylhet showed slightly higher plus level perseverance than Barishal (88.3% vs. 83.4%), a difference that was statistically significant ($p<0.004$), suggesting that repeated adversity may have strengthened children's coping capacity. No gender difference was observed, but this resilience was not universal. A significant difference ($p<0.000$) was found between children with functional difficulties (68.8%) and those without functional difficulties (86.5%). By grade, students' level of perseverance gradually enhanced in upper grades. Family structure also mattered: children not living with their parents demonstrated a markedly lower percentage of plus level perseverance (76.4%) compared to those living with their parents (86.2%) ($p<0.047$), underscoring the importance of family and social support in sustaining motivation after crises.

Figure 3: Percentage of children demonstrated perseverance level by group



The findings suggest that the number of school-closure days[1] is significantly associated with students' socio-emotional development: empathy ($F = 6.868$, $p < 0.001$), perseverance ($F = 4.581$, $p < 0.001$), and self-concept ($F = 7.290$, $p < 0.001$). Empathy and self-concept were particularly sensitive to prolonged closures, indicating that extended disruptions to schooling weaken students' socio-emotional well-being and development.

Overall, these findings show that climate-related school disruptions have a substantial and uneven impact on students' socio-emotional well-being. While many children demonstrate strong perseverance, empathy and self-concept remain fragile, particularly in flood-prone areas such as Sylhet, among students with functional difficulties, and for girls. Prolonged school closures and repeated climate shocks weaken social connectedness and confidence in the future, increasing the risk of emotional disengagement despite high coping effort. These results highlight the need for targeted, sustained SEL and psychosocial support, alongside continuity of schooling, to prevent climate shocks from translating into long-term educational and social exclusion.

Climate shocks have a profound emotional impact on students, as around half of the teacher respondents (51%) reported that they found signs of trauma, fear, and loss of motivation among the students. Teachers observed that many children, especially younger students and girls, became anxious, withdrawn, or inattentive after returning to school. Students often expressed fear of recurring floods or storms, showing stress-induced behaviours such as staring outside during cloudy weather or remaining silent for weeks. A teacher from Barishal said,

> *"After the cyclone, some didn't smile for weeks. They came to school but were silent. Sometimes students stare outside when clouds appear. They think the storm is coming again. They can't concentrate."*

Teachers reported that in schools where teachers introduced informal psychosocial activities such as storytelling, drawing, or "sharing circles", students appeared to recover emotionally more quickly.

[1] Using Anova. Welch's robust tests confirm the significance of these differences for empathy and self-concept ($p < 0.001$), indicating these findings remain valid even when variance assumptions are relaxed. Although the robust test could not be performed for perseverance due to zero variance in one group, the ANOVA still indicates significant variation.

However, these practices were largely voluntary rather than systemic. A teacher from Sylhet said,

> *"We are instructed to continue learning during and after disaster in school or temporary spaces. However, we did not get proper training on how to provide emotional support or regaining motivation for learning to the vulnerable children".*

The analysis of students' self-reported well-being across Barishal and Sylhet divisions reveals a moderately positive but uneven picture, suggesting that while many children "sometimes" or "often" experience aspects of well-being, these experiences are neither consistent nor equitable across groups. On a five-point scale (1=Never to 5=All the time), the overall composite mean for well-being stands at 2.98, indicating that students' sense of well-being is only moderately sustained amid repeated climate disruptions. The study found no significant differences by region and gender. However, a pronounced gap exists for children with functional difficulties, whose overall well-being (2.84) is significantly lower ($p<0.001$). These findings indicate that repeated climate shocks weaken children's physical, emotional, and social health, most severely for students with functional difficulties, underscoring the need for inclusive psychosocial support in climate recovery efforts.

2.1.2 Status of teachers' well-being and stress

Teacher well-being, like that of students, is significantly affected by extreme climate events. A substantial majority of head teachers (75.9%) and class teachers (80.2%) reported negative impacts on their personal well-being due to climate-related disruptions (see Table 1). The proportion was notably higher in Barishal—83% of head teachers and 88.7% of class teachers—compared to 68.3% and 71%, respectively, in Sylhet. While this regional difference was statistically significant only among class teachers ($p < 0.001$), the pattern shows that exposure intensity shapes perceived well-being risks. Gender-based differences also indicate slightly greater vulnerability among female teachers in both roles, though these variations were not statistically significant. Collectively, the high prevalence of reported distress suggests that climate-induced strain on teacher well-being is widespread, persistent, and increasingly normalised within the primary education system.

Table 1: Percentage of teachers' well-being affected by extreme events

Head Teacher	Well-being Effects of Climate Events	Barishal (n=42)	Sylhet (n=41)	Male (n=53)	Female (n=30)	Total (n=83)
	Yes	83.3	68.3	71.7	83.3	75.9%
	No	16.7	31.7	28.3	16.7	24.1%
Class Teacher	Well-being Effects of Extreme Weather	Barishal (n=115)	Sylhet (n=107)	Male (n=77)	Female (n=145)	Total (n=222)
	Yes	88.7	71.0	76.6	82.1	80.2%
	No	11.3	29.0	23.4	17.9	19.8%

However, when examining class teachers' self-assessments on the role and well-being scale, a more nuanced picture emerges. Despite reporting impacts on their well-being, teachers generally express strong social connectedness and a positive sense of health, reflected in consistently high mean scores and a composite well-being score of 4.1 (*See*: Annex V for more details). Strong relationships within schools and communities appear to act as protective buffers. Perceptions of physical safety, however, remain more moderate, indicating an area of vulnerability. Differences across divisions and gender were small: Sylhet teachers felt slightly safer, while Barishal teachers reported marginally better health and school relationships; males reported slightly stronger feelings of safety than females. Yet overall well-being patterns remained stable across groups, suggesting that relational and community support structures help maintain perceived well-being even under climate stress.

Despite these positive relational indicators, both head teachers and class teachers experience moderate levels of stress, with climate-related hazards—especially episodic flooding, cyclones, and extreme heat—emerging as the most severe stressors across all groups. Among head teachers, administrative and interpersonal pressures remain relatively low, but flooding/cyclones (mean 2.94) and heat (2.37) dominate their stress profile (*See*: Annex VI for details). Sylhet head teachers report slightly higher stress from flooding, while Barishal head teachers feel more pressure from cyclones and heat. Class teachers show an even higher stress burden, with several workload-related factors—poor career structure, responsibility for pupils, short rest periods, large classes, and disaster exposure—scoring above 3, indicating moderate to high stress (*See*: ANNEX VII for details). Although division and gender differences are small, class teachers consistently experience more pressure than head teachers, highlighting their front-line vulnerability. Overall, the findings point to a consistent pattern: while teachers maintain strong relational well-being, climate-induced disruptions and heavy workloads are the primary drivers of stress, overshadowing interpersonal or administrative challenges.

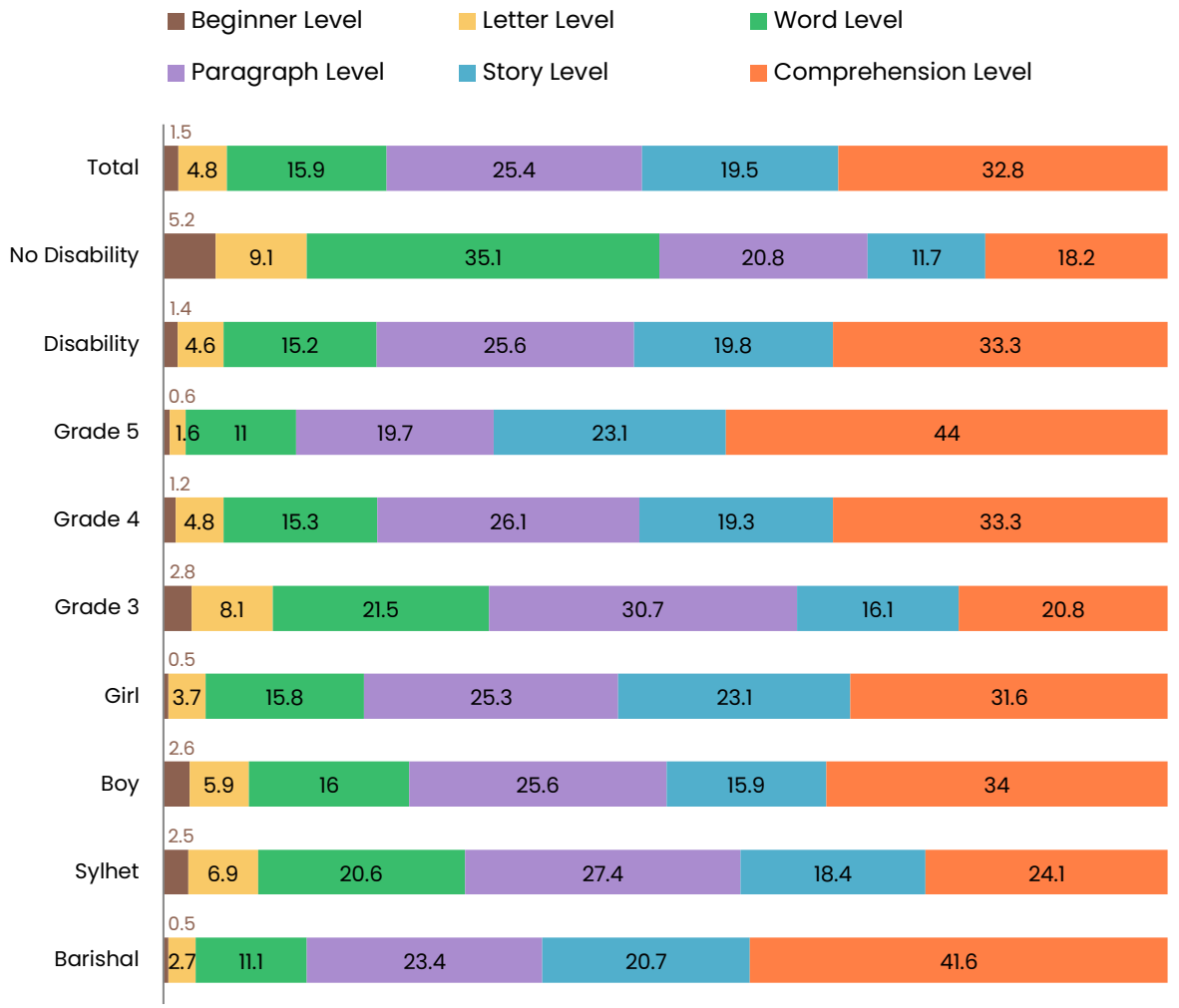
Overall, the findings underscore that emotional recovery of both teachers and students is essential for learning recovery. Without structured psychosocial support and formal integration of social-emotional learning (SEL) in disaster response plans, teachers' and children's mental well-being and classroom engagement remain fragile in climate-affected regions.

2.2 Status of foundational literacy and numeracy in climate-affected schools

The assessment of foundational literacy and numeracy skills conducted among the students of Grades 3, 4, and 5 demonstrated overall low proficiency, especially in Sylhet and among children with difficulties, repeaters, and past dropouts.

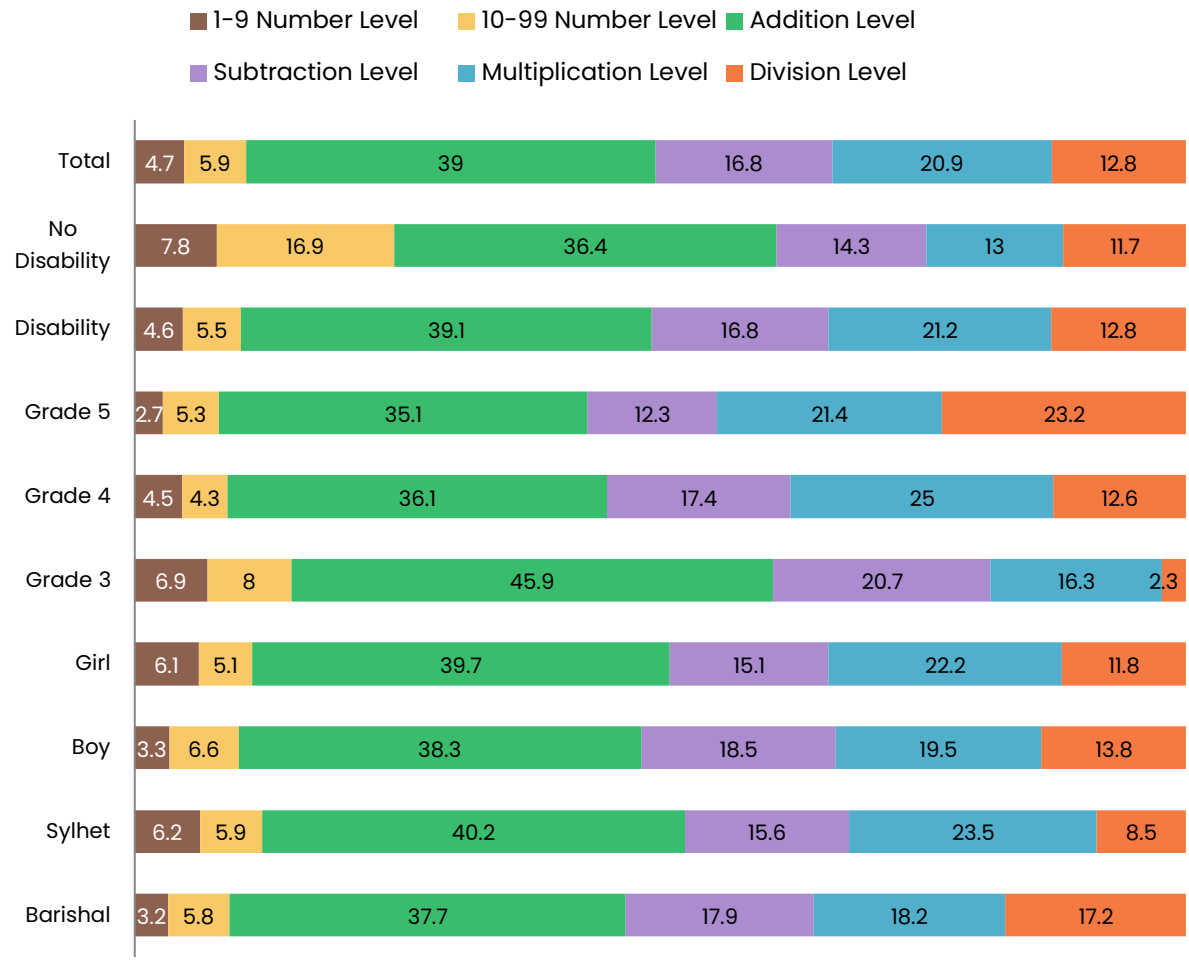
In Bangla reading, the regional divide is pronounced ($p<0.001$). Students in Barishal performed significantly better, with 41.6% reaching the comprehension level and 20.7% the story level, reflecting comparatively better reading fluency and understanding. In contrast, students in Sylhet were concentrated in the lower skill bands, with only 24.1% demonstrating comprehension and 18.4% at story level (*See*: Figure 4). Thirty percent of the students in Sylhet remained at the word or below level, while in Barishal only 14.4% were at this level. In numeracy, similar regional disparities persist. Students in Barishal are nearly twice as likely to perform at advanced levels, with 17.2% reaching the division category compared to only 8.5% in Sylhet ($p<0.001$). The concentration of Sylhet's students in the basic number and addition levels indicates that while they can handle simple calculations, they struggle with multi-step operations requiring higher cognitive engagement (*See*: Figure 5).

Figure 4: Percentage of children achieving reading level by group



To compare with national level data, Multiple Indicator Cluster Survey (MICS) 2025 assessed reading and numeracy competencies which found that 50% children demonstrated foundational reading skills with 47% in Barishal and 43% in Sylhet (BBS & UNICEF, 2025). In contrast, only 32.8% of children in this study demonstrated foundational reading skills—41.6% in Barishal and just 24.1% in Sylhet. Disparities are even more pronounced in numeracy. According to MICS 2025, 39.0% of children demonstrated foundational numeracy skills nationally. However, this assessment found that only 12.8% children demonstrated foundational numeracy skills overall, with 17.2% in Barishal and only 8.5% in Sylhet. These findings indicate a substantial gap between national-level learning outcomes and performance in climate-vulnerable areas, underscoring the compounded impact of environmental vulnerability on foundational learning achievement.

Figure 5: Percentage of children achieving numeracy level by group



The multiple regression analysis examined the influence of school closure duration and number of teachers on students' reading and numeracy performance. The multiple regression model for reading performance is statistically significant (R = 0.367, R^2 = 0.134, $F(2,2270)$ = 176.14, p < 0.001), indicating that 13.4% of the variance in reading levels is explained by school closure duration and number of teachers. The number of days schools were closed shows a strong negative association with reading achievement (B = -0.020, β = -0.281, p < 0.001), meaning that longer closures significantly reduce students' reading levels. In contrast, the number of teachers has a positive and statistically significant effect (B = 0.073, β = 0.159, p < 0.001), suggesting that higher instructional capacity supports better reading outcomes. The larger standardised coefficient for school closures indicates that instructional disruption has a stronger influence on reading performance than teacher availability. Multicollinearity is not a concern (VIF = 1.13).

The numeracy regression model is also statistically significant (R = 0.291, R^2 = 0.085, F(2,2270) = 105.37, p < 0.001), explaining 8.5% of the variance in numeracy performance. School closure days are negatively associated with numeracy outcomes (B = -0.012, β = -0.159, p < 0.001), while the number of teachers shows a positive and significant association (B = 0.091, β = 0.197, p < 0.001). Compared to reading, the negative effect of school closures on numeracy is smaller, while the positive effect of teacher availability is relatively stronger. Collinearity diagnostics again confirm stable estimates (VIF = 1.13).

Across both domains, school closures significantly depress learning outcomes, with a stronger adverse effect on reading than on numeracy. Teacher availability improves both reading and numeracy performance, but it does not fully offset the negative impact of prolonged school closures. This evidence highlights instructional continuity as the most critical determinant of foundational learning, while staffing acts as a secondary but important protective factor.

Thus, the significant effect of school closure on student performance, combined with the sharp performance differences between the two regions, appears closely linked to the contrasting nature and duration of climate disruptions experienced in Barishal and Sylhet. Barishal's periodic cyclones tend to cause shorter interruptions to schooling, while Sylhet's prolonged flooding and water stagnation severely restrict students' access to classrooms and learning materials. On average, Sylhet schools experienced 29 days of closure, with some up to 90 days, compared with an average of 15 days in Barishal, ranging up to 35 days. As schools in Sylhet often become inaccessible or are used as shelters, reading practice and instructional continuity are disrupted for weeks at a time, resulting in cumulative learning setbacks. Schools that reopen quickly and sustain attendance, as seen in Barishal, demonstrate stronger reading and numeracy outcomes. In contrast, prolonged closures in flood-affected Sylhet correspond with wider learning gaps. As discussed earlier, the recurrent and long-lasting nature of climate events in Sylhet leads to extended school closures and high absenteeism, which shows a link with students' learning—a pattern reflected in these results.

Statistically significant gender differences in literacy were observed ($p < 0.001$), revealing a consistent pattern in which boys slightly outperformed girls in foundational reading skills. Approximately 34.0% of boys demonstrated foundational reading skills compared to 31.6% of girls. Boys were also overrepresented at the beginner and letter levels. Gender differences in numeracy were smaller in magnitude but remained statistically significant ($p < 0.001$). Similar to reading outcomes, boys marginally outperformed girls, with 13.8% of boys demonstrating foundational numeracy skills compared to 11.8% of girls.

However, this pattern contrasts sharply with national-level findings. Nationally, girls outperform boys in both reading and numeracy. In reading, 55.0% of girls demonstrated foundational reading skills compared to 46.0% of boys. At the regional level, girls outperformed boys in both Sylhet and Barishal, with the disparity particularly pronounced in Sylhet, where only 35.0% of boys demonstrated foundational reading skills compared to 51.0% of girls. In Barishal, the gender gap in reading was smaller, at approximately 8 percentage points. A similar trend is observed in numeracy. Nationally, girls (40.0%) slightly outperformed boys (39.0%) in foundational numeracy skills. Regionally, however, the pattern varies. In Barishal, boys (36.0%) marginally outperformed girls (34.0%), whereas in Sylhet, girls (39.0%) performed notably better than boys (34.0%) (BBS & UNICEF, 2025).

Overall, while boys show a slight advantage in foundational literacy and numeracy within the study sample, national and regional comparisons suggest that this pattern is context-specific and diverges from broader national trends, particularly in climate-vulnerable regions.

Further, the literacy gap is particularly severe among students with functional difficulties. Only 18.2% of students with functional difficulties achieved foundational reading skills, compared to 33.3% of peers without such challenges ($p<0.001$). The same is true across all numeracy domains ($p<0.001$). Children with functional difficulties are overrepresented in the lowest levels—7.8% in single-digit numbers and 16.9% in two-digit operations—and underrepresented in higher-level problem-solving (11.7). This disparity highlights the structural exclusion these students face—physical barriers in accessing school, lack of adaptive teaching aids, and reduced individualised support. Floods and cyclones often exacerbate these limitations, interrupting any consistent reading practice or remedial assistance they might receive. The evidence calls for inclusive literacy interventions such as one-on-one mentoring, peer tutoring, and assistive reading tools to prevent further marginalisation.

Figure 6: Percentage of children achieving reading level by gender

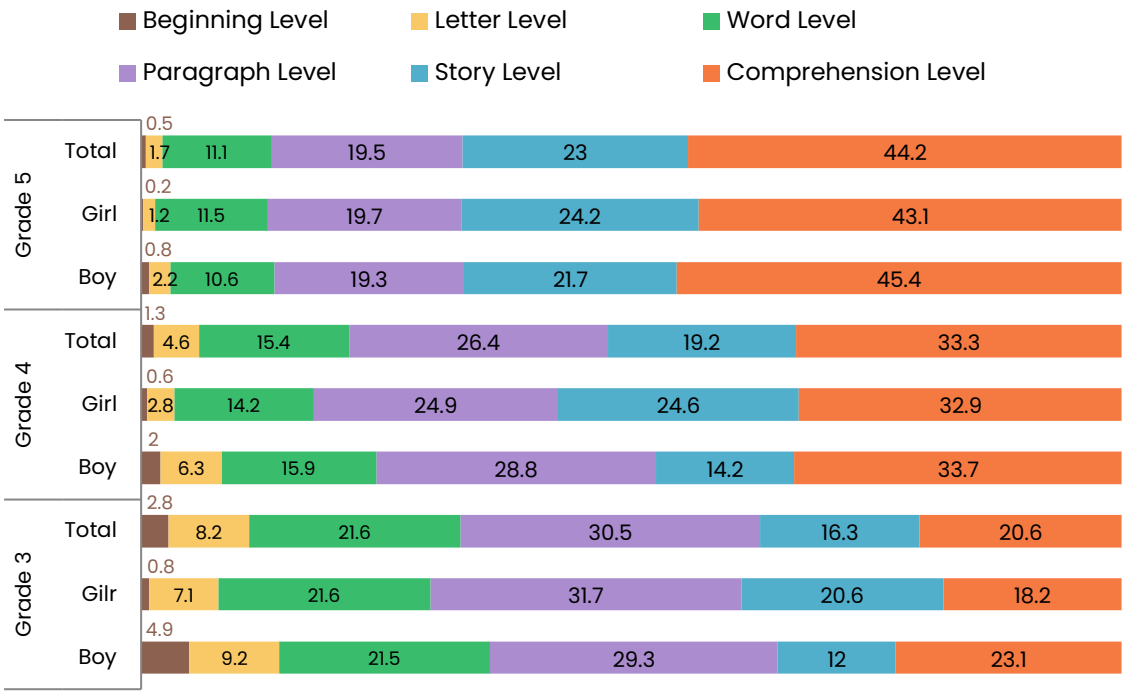
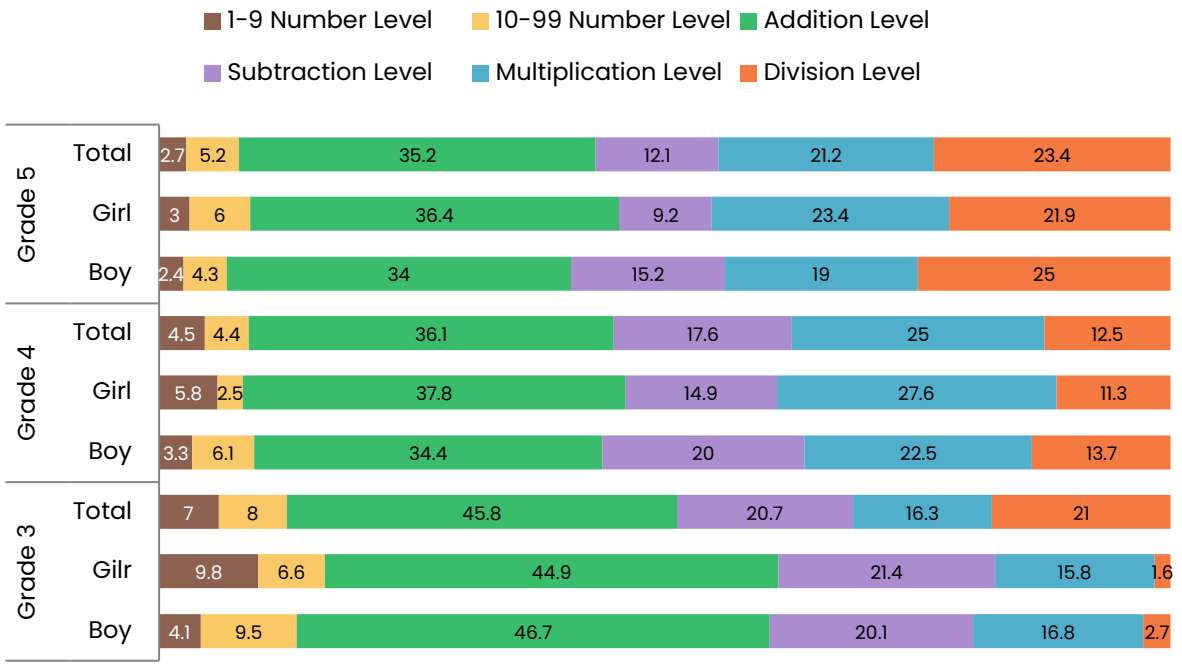


Figure 7: Percentage of children achieving numeracy level by gender



Reading performance improves predictably across grade levels, confirming that when schools remain open, the national curriculum supports progressive skill acquisition. For instance, only about one in five Grade 3 students demonstrated foundational reading skills, compared to nearly half of Grade 5 students. However, a substantial proportion of students still struggled with basic reading: 32.4% of Grade 3, 21.3% of Grade 4, and 13.6% of Grade 5 students were unable to read simple sentences. Numeracy skills also improved with grade progression. For example, only 2.3% of Grade 3 students demonstrated division-related foundational numeracy skills, compared to 23.2% of Grade 5

students. Nevertheless, persistent foundational gaps remain: 14.9% of Grade 3 students, 8.8% of Grade 4 students, and 8.0% of Grade 5 students were still at the number-recognition level.

Gender-disaggregated analysis shows that girls significantly outperformed boys in the lower grades. In Grade 3, girls demonstrated stronger performance in both reading ($p < 0.001$) and numeracy ($p = 0.032$). This advantage continued in Grade 4, where girls again outperformed boys in reading ($p < 0.001$) and numeracy ($p = 0.013$). However, by Grade 5, no statistically significant gender differences were observed in either reading ($p = 0.696$) or numeracy ($p = 0.830$). This pattern suggests a convergence in performance over time, potentially reflecting either a relative slowdown in girls' learning gains or an improvement in boys' performance as grade levels advance.

There is limited national-level data disaggregated by grade that is directly comparable with this study. However, the Multiple Indicator Cluster Survey (MICS) 2025 assessed reading and numeracy competencies among students attending Grades 2–3 and found that 29.0% demonstrated foundational reading skills (BBS & UNICEF, 2025). In contrast, only 20.8% of Grade 3 students in this study demonstrated foundational reading skills—27.7% in Barishal and just 14.0% in Sylhet. Disparities are even more pronounced in numeracy. According to MICS 2025, 21.0% of Grade 2–3 students nationally demonstrated foundational numeracy skills. However, this assessment found that only 2.1% of Grade 3 students demonstrated foundational numeracy skills overall, with 3.6% in Barishal and only 0.8% in Sylhet. These findings indicate a substantial gap between national-level learning outcomes and performance in climate-vulnerable areas, underscoring the compounded impact of environmental vulnerability on foundational learning achievement.

Repetition and dropout further intensify learning loss. Students who repeated a grade or previously dropped out show the weakest reading outcomes, concentrated at the word level, and disproportionately weak numeracy skills, with many stuck at basic number recognition or single-operation stages (10.6%). These patterns demonstrate that when schooling is interrupted and learning support is absent due to this interruption, learning deficits accumulate rapidly, leading to chronic underperformance.

Learning gaps in foundational literacy and numeracy are also a challenge for teachers as they hinder learning progression and lead to repetition in instruction. Teachers attributed this learning loss to irregular attendance, damaged materials, and shortened class time. One class teacher in Sunamganj stated, "We start from the basics again every time they return. It feels like rebuilding the same wall that falls every year." The cumulative effect of disrupted schooling, stress, and material loss creates a cycle of learning regression. Another teacher from Barishal said,

> *"Students particularly from disadvantaged situation need regular learning support. However, due to school closure or students' absence in school after disaster, this support disrupted and thus students fall behind."*

Along with our assessment, a previous study also shows that children from poorer households, who lacked access to textbooks or parental guidance, suffered the greatest setbacks (CAMPE, 2021; 2022). However, where teachers and peers provided structured support—such as small-group tutorials, home assignments, or storytelling activities—students showed faster emotional and academic recovery (Ahmed, 2025; Islam et al., 2024).

The analysis underscores two key insights. First, school closure is associated with low performance, so instructional continuity is necessary for learning recovery. Second, vulnerability amplifies loss, as marginalised students experience compounded disadvantages in literacy and numeracy.

3. COPING STRATEGIES USED BY SCHOOLS, TEACHERS, AND STUDENTS

Climate-related disasters in Bangladesh force schools, teachers, and students at their individual or household level to adopt a variety of coping strategies to sustain education. While some responses, such as flexible attendance, community learning centres, or temporary classrooms, reflect resilience and adaptation, others involve harmful trade-offs, including child labour, reduced food intake, or school dropout.

3.1 School coping strategies

Bangladesh's disaster governance framework provides a clear policy guideline for protecting learning continuity during emergencies, anchored in the Disaster Management Act (2012), the Standing Orders on Disaster (SOD), and operationalised through PEDP4. Together, these instruments define responsibilities across national, district, and school levels—ranging from preparedness and early warning to temporary learning arrangements and post-disaster recovery. While this framework establishes a comprehensive set of interventions on paper, later sections show that their effectiveness at the school level depends heavily on implementation conditions, particularly financing flexibility, coordination capacity, and standardised damage assessment processes. As a result, gaps persist between national intent and how measures such as temporary learning spaces and rapid recovery are realised in practice.

Table 2: Education-related disaster preparedness and response initiatives in policy framework

Key Education-Focused Initiatives	Responsible Actors
School preparedness and safety planning	MoPME, District & Upazila Education Offices, Local Disaster Management Committees
Contingency planning and budget	MoPME, District & Upazila Education Offices, Schools
Teacher training on emergency response	Directorate of Disaster Management, Directorate of Primary Education
Temporary learning arrangements	School teacher, Education officers, Local Disaster Management Committees and community people,
Coordination of closures and reopening	MoPME, District & Upazila Education Offices
Rapid damage assessment and reporting	District & Upazila Education Offices, Local Disaster Management Committees

In response to the policy guideline regarding preparedness and safety planning, our assessment findings indicate that schools lack sufficient preparation and safety planning to manage the adverse effects of climate-related disasters. Overall, results show that schools have some preparation in place, but these are generally weak, inconsistent, and implemented in a limited to moderate extent. Across all items, mean scores cluster between 2.58 and 2.82 on a 1-4 scale (1= Not at all, 2 = To a small extent, 3 = To a moderate extent, 4 = To a large extent), suggesting that disaster preparedness practices exist but are neither systematic nor robust (*See:* Table 3). Regionally, Barishal shows slightly better disaster preparedness than Sylhet though the difference was not statistically significant ($p = 0.810$). Core preparedness activities such as building inspections/drills (mean 2.59) and evacuation planning (mean 2.82) are implemented only "to a small to moderate extent," implying that many schools remain operationally vulnerable during emergencies. Health and safety protocols also score moderate (2.80), underscoring gaps in managing disease outbreaks after disasters. Regarding inclusive policies to provide, in particular, support to the most vulnerable children during and after a

natural hazard, the score is 2.58. Farid et al. (2021) also reported similar findings that concluded absence of an institutional preparedness plan and system from the school to the national level for the continuity of education during a flood. This gap suggests that schools rely heavily on informal adaptation and individual teacher initiative rather than on coherent institutional preparedness systems.

Table 3: School policy and practice regarding disaster preparedness planning

School policy and practice	Barishal (n=42)		Sylhet (n=41)		Total (n=83)	
	Mean	SD	Mean	SD	Mean	SD
Disaster preparedness planning (such as drills, Inspection of school buildings)	2.62	1.10	2.56	1.03	2.59	1.06
Evacuation and shelter plans in case of a natural hazard	2.86	1.22	2.78	1.26	2.82	1.23
Health and safety protocols to protect to prevent spread of diseases during or after a natural hazard	2.90	1.03	2.68	0.93	2.80	0.99
Inclusive policies to provide in particular support to the most vulnerable children during and after a natural hazard	2.60	1.04	2.56	0.90	2.58	0.96

Regarding contingency planning and budget, our study shows that schools generally lack contingency plans as disasters occur suddenly and damages cannot be estimated earlier. As a result, institutional support mechanisms for schools remain weak. Only 30% schools reported receiving any assistance from education authorities during or after extreme climate events. Among schools that received assistance, the most common form was financial assistance (19.3%), typically small cash allocations followed by receiving material support such as replacement of damaged furniture or learning materials in a smaller proportion of schools (9.6%). According to education officials, although there is a provision of contingency budget in PEDP4, this limited support stems primarily from the absence of an available immediate emergency budget at the local level during or immediately after climate events. As one Education Officer from Barishal explained,

> *"We do not have any available budget to cover emergency needs. We assess the loss after a disaster, but by the time funds are allocated from the central level, it is too late to meet urgent requirements. It would be better if an emergency budget were placed at our disposal so we can disburse support when necessary."*

Consequently, the lack of institutional responsiveness often leaves schools dependent on community initiative or external sources for rehabilitation.

Though policy framework guides for teacher training on emergency response and organising temporary learning arrangements, our assessment shows a lower practice at the school level. In the assessment, the score on emergency response like first-aid/CPR training etc. was 2.16 which means teachers got the training to a very small extent. In case of counselling services for children and teachers, scores (≈2.40) also range within a small extent, which means the services are not consistently delivered. Planning for temporary and remote learning arrangements is also very low in practice as evidenced in our assessment. Survey scores show that scores for temporary learning spaces (2.07) and remote learning plans during closures (2.36) are implemented to a smaller extent. Most headteachers reported that they are not well informed about policy guidelines; rather at the

school level, they mostly rely on local improvisation and local education officials' instructions instead of formal policy guidance. Assessment found that school level coping strategies cluster around rapid reopening, alternative learning spaces (e.g., in dry houses or community centres), flexible timetabling (e.g., adjusted class schedules, conducted double shifts, or shortened lessons), low-tech continuity, and community mobilisation. Schools with active SMCs played a critical role in reopening classrooms, repairing roofs, and mobilising resources. For rapid assessment of damages and loss of school resources, both schools and local education offices work together immediately after any disaster events. According to both teachers and education officers, usually local education offices instructed teachers to assess the damages and loss, and then teachers with SMC members assess the damages. Sometimes, local education officials also visit schools to inspect the damages. Though rapid assessment is done in the affected schools, however, most of the schools did not get the contingency/emergency budget or support on time as mentioned above (only one-third schools get the support) which leaves schools solely relying on their own arrangement for preparing schools to continue education in alternative spaces or opening schools after disaster events.

Table 4: Teacher training and learning continuity status

School Policy and practice	Barishal (n=42)		Sylhet (n=41)		Total (n=83)	
	Mean	SD	Mean	SD	Mean	SD
Disaster preparedness training for teachers (including First aid/CPR training)	2.19	0.99	2.12	1.08	2.16	1.03
Counselling for children suffering from PTSD during/ after natural hazard	2.45	1.02	2.34	0.99	2.40	1.00
Counselling for teachers suffering from PTSD during/after natural hazard	2.43	1.06	2.39	1.07	2.41	1.06
Remote learning plans in case of school closure due to natural hazard	2.33	1.07	2.39	1.07	2.36	1.07
Temporary learning places in case of school closure due to natural hazard	1.95	0.96	2.20	1.10	2.07	1.03

Opening after disaster events, some schools conduct extra classes or remedial classes to minimise the learning loss during climate events. Around a quarter of the schools (27.7%) reported that they organised extra or remedial classes for the students with the percentage slightly higher in Sylhet (29.3%) than Barishal (26.2%). This difference likely reflects the longer and more frequent flood-related school closures experienced in Sylhet, which create greater demand for remedial support than in Barishal. In support of this practice, a teacher from Barishal region describes,

> *"After every major climate event, we extend our working hours for weeks. We conduct additional morning or afternoon sessions because students lose so many instructional days. Catching them up is exhausting, but otherwise they fall too far behind."*

Previous studies have found similar coping strategies adopted by schools and teachers to ensure continuity of learning but have also included emergency cleaning, rehabilitation, and adjusting attendance requirements. For example, in displacement zones or shelters, temporary learning spaces, including community learning centres and mobile schools, have emerged to fill gaps in formal education, often offering essential materials through Education in Emergency (EiE) kits. Sometimes, schools partnered with NGOs to provide alternative learning opportunities or catch-up programmes to provide additional learning support by conducting additional classes, after-school programmes, etc. (Islam et al., 2021). In some areas, mobile teaching models where educators visited

shelters or remote communities were piloted, though these remained geographically limited and difficult to sustain without institutional backing (UNICEF, 2024a).

Gendered patterns were also evident in return to school after climate events. In several accounts, head teachers noted that girls' return was moderated by family concerns about safety on damaged routes and by caregiving roles during recovery. Schools follow several strategies to bring girls back early, pairing safe-route assurances with escorted walks, coordinating clustered arrivals, and beginning the day with group activities that felt socially safe. Boys' return was often shaped by short-term income opportunities in post-disaster labour; schools that held afternoon "re-entry" sessions for slow returners reduced the slide into irregularity.

The Education in Emergencies guidelines under PEDP4 recommend the use of temporary or makeshift structures as transitional schools in disaster-affected areas during emergency periods. These guidelines also include standard designs for makeshift schools with integrated WASH facilities that can be replicated where permanent school infrastructure is damaged. In addition, PEDP4 promotes selected climate-smart interventions—such as solar panels and appropriate insulation systems to improve energy efficiency, and measures to enhance water and food security, including rainwater harvesting and school gardens. However, the policy framework does not provide explicit guidance on teaching–learning strategies during emergencies. Against this policy backdrop, our assessment identified notable regional variations in practice. Division-specific contrasts were pronounced. Barishal, where wind damage and storm surges are acute but episodic, emphasises structural triage and rapid, visible reopening after cyclones that includes clearing debris, checking building safety, re-hanging doors and tin sheets, and restoring WASH to minimally functional levels so that classes could restart within days. Schools that double as cyclone shelters implemented quick transitions from shelter mode back to school mode, e.g., airing out rooms, relocating displaced families to community spaces, and retrieving salvaged teaching materials. Timetables were then compressed and staggered: double-shift days for combined grades, short blocks for core subjects, and "catch-up windows" inserted in the late morning when attendance tends to peak after ferry (kheya) delays.

In Sylhet, the dominant challenge is duration rather than intensity. Prolonged waterlogging reshapes the whole school calendar. As a result, schools emphasise spatial and temporal flexibility—where to teach and when to teach—amid long recovery arcs. Head teachers described relocating classes to raised platforms in veranda, shade structures, community mosques or community centres, on the dry edge of marketplaces, or to the few rooms above flood lines. A headteacher from Sylhet said,

> *"When the school compound becomes fully submerged, we do not wait for instructions from outside. The teachers and community jointly identify raised houses or cyclone shelters and shift classes there. Sometimes we conduct lessons on the veranda of a nearby high building just to make sure the children don't lose the rhythm of learning."*

Where buildings remained accessible but approaches were submerged, head teachers negotiated with boat owners to synchronise first periods with safe crossing times, accepted "wet starts" (late arrivals formally marked present), and relaxed uniform rules so children could come in whatever dry clothing they had. Some resilient schools paired these accommodations with micro-timetabling—establishing short, predictable lesson cycles for Bangla reading and arithmetic fluency so that even partial attendance yielded instructional value.

In both divisions, a common pattern is that teachers feel compelled to complete the syllabus within the academic period because students must sit for terminal examinations. As a result, schools sometimes force teachers to rush content, focus on teaching the significant learning objectives only, or skip certain topics entirely to meet deadlines after closures. This allows formal completion of the syllabus but compromises quality and deep learning.

However, in case of extreme heat, schools in both divisions usually shifted to earlier morning sessions to avoid the heat. Sometimes they shifted classrooms outside—under trees or open space where air can flow freely. A teacher from Barishal said,

> *"During adverse weather we, at times, face difficulties in conducting classes. That's why we have to take alternative approaches. For instance, during excessive heat, we conduct classes outside the classroom, under the shades of trees. This turns out to be a massive relief from the intolerable heat."*

According to the teacher interviews, a system of low-tech continuity was practiced in both divisions. When textbooks were damaged or lost, photocopied "skill strips" (letters, words, number facts, four-operation practice) circulated class-to-class by the teachers; in Barishal, teachers reused laminated charts rescued from shelter storage, and in Sylhet, schools placed old readers in "dry boxes" at higher shelves to seed peer reading circles when students trickled back. Head teachers leaned on simple attendance-plus-task logs to keep movement between temporary and formal classrooms coherent: every child who arrived, even for an hour, left with a short practice task to carry forward. A head teacher from Sylhet said,

> *"During disasters, teachers try to keep communication with students and parents through phone calls or small group meetings. They give simple home tasks or oral lessons when regular classes are not possible. After the disaster, teachers arrange extra classes and use flexible schedules to help students catch up. They also motivate students and provide mental support so they don't lose interest in studies. The main strategies are teamwork among teachers, counselling, and using local resources to continue education."*

These practices were often backed by School Management Committees and PTAs, who organised small repairs, procured bleaching powder and oral rehydration salts, and helped re-establish safe routes.

3.2 Teacher coping strategies

Teachers play a central role in sustaining learning during crises, being "the frontline actors ensuring continuity of learning" in emergencies and disruptions (UNESCO, 2015; INEE, 2024; UNESCO & UNICEF, 2021). However, when teachers themselves are affected by climate events, they need to play a dual role. Previous research shows that teachers face high levels of stress, limited training in psychosocial support, and shortages of learning materials during climate events, making it difficult to restore classroom instruction after disasters (ICCG-HCTT, 30 August 2024; Dickie & Paul, 1 May 2024; Worland, 18 August 2020; Islam et al., 2021). Our results are in line with these findings.

Teachers and head teachers often continue working while coping with their own household losses and environmental trauma, which may undermine their professional performance and motivation over time. Yet, many teachers expressed frustration at the absence of formal psychosocial support systems and the lack of structured recovery training.

Indeed, teachers were central to the adaptation process to ensure learning continuity: stabilising classroom routines, triaging for foundational skills, and regulating the emotional climate. Seventeen percent of teachers reported that they conducted a home visit after disasters to encourage learners to return to school. A class teacher from Sylhet stated,

> *"When students cannot come to school, we go to them. Even if the roads are muddy or knee-deep in water, we visit their homes to make sure they are okay and to remind them that learning will continue. Sometimes we give small homework tasks they can do until school resumes."*

In Barishal, teachers commonly described a "reset ritual" on the first week back after school closure that includes short morning circles to acknowledge shared loss, a visual timetable posted for the day, and immediate, low-stakes tasks that everyone could succeed at (e.g., copying new words, choral counting, paired reading). This ritual restored predictability, which mattered for all learners but especially for those who returned anxious. In Sylhet, where reopening was partial and staggered, teachers developed "lesson fragments"—fifteen-minute reading and number fluency bursts repeated across small groups as children arrived by boat or on foot. The fragments used familiar materials and tight routines so that learning did not require long attention or complete classes. For instance, a teacher from Sylhet said,

> *"Often only two or three classrooms remain usable during heavy rain. We merge sections, shorten periods, and rotate classrooms so that every group gets some instructional time each day. It is not ideal, but it keeps the school running until conditions improve."*

Triaging learning loss was the dominant professional task. Teachers in both divisions deprioritised content breadth and zeroed in on essential reading and numeracy sub-skills: letter-to-sound correspondence, word recognition, sentence-level comprehension, number range fluency, and the four operations. Rather than trying to "cover everything," they grouped children loosely by demonstrated level and rotated through them with brief, directed practice. A class teacher from Barishal said described,

> *"After the cyclone closures, we stopped trying to finish the whole syllabus. It simply wasn't realistic. Instead, we focused only on what would help children read again—letter sounds, small words, simple sentences. In Maths, we concentrated on number ranges and the four basic operations. If they can't decode or add, nothing else matters."*

Teacher and head teachers perceived that where this was systematic, repetition fell and confidence rose; where it was improvised day-to-day, the same children remained stuck at decoding and single-operation arithmetic. For example, a head teacher from Barishal stated,

> *"Where we followed a fixed routine—same groups, same skills, same short drills every day—I saw rapid improvement. Children began recognszing words faster, mistakes reduced, and they became more confident. Repetition went down because the practice was consistent and purposeful."*

Teachers also became first-responders for social-emotional recovery. Around half of the teachers interviewed (48.2%) reported that they provided social-emotional support to the students. However, this was higher in Barishal (59.5%) than Sylhet (36.6%) and almost identical by gender. They narrated the arc from visible fear, children flinching at thunder or staring at dark clouds, to the quieter fatigue that emerged weeks later. To counter this, many introduced short storytelling, drawing, or "sharing circles," and they built in frequent, effort-based praise. For instance, a class teacher from Barishal said:

> *"After a storm or flood, children come to school scared and distracted. They talk about roofs being blown away or seeing their livestock drown. Before starting any lesson, I sit with them, tell them stories, and reassure them that they are safe in school. These conversations calm them and help them refocus on learning."*

Several accounts described intentional re-seating to promote peer comfort: pairing shy returners with peers, placing anxious children near the teacher's desk, and keeping talkative but positive classmates at the centre of group work. These were not branded programmes; they were craft moves. Still, they functioned as psychosocial scaffolds that made academic triage possible.

There were differences across divisions in the challenges teachers faced. In Barishal, teachers spoke more about physical access: how they themselves crossed broken ferries or detoured on foot to reach school and about managing combined classes when colleagues could not travel. In Sylhet, teachers stressed stamina: running multiple short cycles across the day, teaching in ad hoc spaces, and preserving voice and energy despite damp conditions and long commutes. In both divisions, the teachers' own loss—damaged homes, displacement—surfaced as a shadow variable. Those with stronger peer collegiality inside staffrooms recovered their instructional rhythm faster; where staffs were thin and isolated, instructional quality lagged even after doors reopened. A teacher from Barishal said,

> *"When we reopened, the first thing we did was sit together in the staffroom and divide the students by skill level. We agreed on the same routine and practiced the same drills. Because of this, the children regained their reading speed very quickly."*

Findings show that around 38.5% teachers reported that they get strong collegial support in teamwork, co-planning, or receive emotional/instructional support that helped them to cope in the stressful situation. Regionally, the percentage is found to be higher in Barishal (47.6) than Sylhet (29.3). By gender, female teachers (51.6%) are found with more collegiate support than their male colleagues (30.8%). Reversely, the percentage of staff isolation is higher in Sylhet (24.4) than Barishal (9.5) and among male (19.2) than female (12.9). Regarding staff isolation a teacher from Sylhet stated,

> *"We don't have enough teachers, and after the floods it becomes worse. Two of our teachers were absent, because their homes were damaged. I had to handle three classes alone. Without colleagues to coordinate with, every day felt like starting from zero. The students who struggled before the cyclone remained stuck."*

Although both male and female teachers provided social-emotional and learning support to students to cope with learning after extreme climate events, these coping and response mechanisms among teachers varied by gender. Male teachers more often framed their coping around discipline, crowd management, and maintaining order during partial reopening, while female teachers more often foregrounded reassurance, check-ins, rebuilding confidence, and were proactive in providing emotional support to children who had gone through extreme effects. Previous studies from Bangladesh and outside also revealed that coping mechanisms among teachers varied by gender where males teachers were found using active coping, religion, self-balance, positive reframing, etc. strategies while female teachers were found using emotional support, instrumental support, behaviour management, acceptance, etc. (Islam & Sultana, 2020; Islam & Wadud, 2011). Noguchi (1996) found that men are more likely to report using problem-focused strategies and women are more likely to report using emotion-focused strategies in dealing with stressful events.

3.3 Household and student coping strategies

Household and student coping mechanisms play a crucial role in either preventing learning loss and dropout or accelerating them. Previous research in cyclone-hit areas shows that 28% of children dropped out of school, while in flood-hit areas, around 32% left due to displacement, economic strain, and damaged infrastructure after the climate events. Displaced parents often delayed enrolment due to deprioritising schooling (30%), lack of information on available schools (21.7%), or turning to non-formal NGO-run centres (20.8%) (Islam et al., 2021).

Floods are an almost annual occurrence in the Sylhet region. Since a large part of this region is covered in haors or waterlogged areas, roads become submerged due to heavy rains or monsoon waterlogging, making it difficult to get to school. To cope with this change in flood monsoon,

according to teacher interviews, many children learned to traverse watery paths: swimming short stretches with dry clothes in a polythene bag or waiting for neighbours to share a narrow boat.

Flood and cyclone-affected students adopted a range of coping strategies to remain connected to learning. They often relocated to raised houses, neighbours' homes, or community shelters to continue studying when their own homes were flooded or too damaged, or started studying at night if increased responsibilities impacted their ability to learn during the day. A teacher from Sylhet explained, "During floods, students move to a neighbour's high house or shelter and study there with whatever books they can save." Because many marginalised children's books were damaged, washed away, or unaffordable to replace, they depended heavily on peer support—sharing books, studying together informally, and copying lost notes from friends. As a head teacher from Barishal noted, "When their books get wet, students share books with friends and learn together so that they do not fall behind." Some children also tried to continue learning from salvaged materials, old notes, or borrowed books.

Interview with teachers revealed that when it came to supporting learning once back at school, learners demonstrated resilience through peer learning and mutual support, such as informal study circles, small-group learning under trees or verandas, borrowing notes, repeating exercises with a friend, and, in stronger classes, running informal "explainers," where a fluent reader helped a small group decode a story passage. Teacher interviews mentioned that peer mentoring helped students regain confidence faster and reduced absenteeism. In a few schools older students helped younger peers with reading lessons, which improved re-engagement after floods.

Children with cognition or communication difficulties struggled most with changed routines and locations; they re-engaged where teachers provided visual cues, predictable lesson sequences, and patient peer buddies, and where families or neighbours could accompany them at least for the first weeks. Without that scaffolding, they either stayed home longer or attended but disengaged. A teacher from Sylhet said,

> *"We suffer more in case of children with disabilities and learning difficulties. We need to work more on them. We provide them small and easy tasks and sometimes demonstrate how to do it. We also engage advanced level students to provide them support during their tasks. Students who do not get individual support hardly progress."*

3.4 Community coping strategies

Community people play a significant role in continuing learning in schools. When school infrastructure is submerged or used as emergency shelters, the community provides alternative venues such as religious sites, elevated roads, or private lands to ensure lessons continue. This decentralisation is a key resilience strategy, with one teacher from Sylhet reporting:

> *"We coordinate with the local administration to convert the school itself into a temporary shelter … teachers go to designated locations (such as elevated roads, mosques, or temples) to give students homework and revise lessons".*

In case of school reopening, community people in some school areas took part in cleaning and restoration of the schools. In Barishal, children returned even when classrooms were still airing out and grounds were muddy, often sitting on mats or salvaged benches for the first few days. In both divisions, SMC or community members often helped transport children to school by providing boats and repairing damaged roads. Several teachers emphasised that when a community values education as a collective responsibility, recovery is faster and more sustainable.

Financial and psychosocial support is often crowdsourced from within the local community to assist students who have lost educational materials or are facing food insecurity due to the disaster. This neighbourhood-level safety net is crucial for vulnerable students, as a headteacher from Barishal noted that,

> *"Financial and moral support from local well-wishers also helps students overcome difficulties … mothers' gatherings and community meetings help parents understand the importance of education".*

4. GOOD PRACTICES FOR BUILDING CLIMATE-RESILIENT EDUCATION SYSTEMS

Bangladesh's primary schools in Barishal and Sylhet operate under continuous exposure to cyclones, tidal surges, flash floods, and extreme heat. Despite these challenges, the rapid assessment revealed a set of locally evolved, scalable best practices that enabled schools to protect students, sustain learning during crises, and reopen rapidly after disasters. These practices—implemented by head teachers, class teachers, and Upazila/District Education Officers—offer actionable insights to strengthen national resilience.

Pre-disaster

1. Climate-resilient infrastructure and safe storage systems

Under PEDP4, Bangladesh adopted a disaster-resilient and inclusive school infrastructure model aligned with the National Standards of Safe Schools and the National Plan for Disaster Management (NPDM) 2021-2025, prioritising facilities that remain safe and functional before, during, and after emergencies. Schools in coastal, flood-prone, and haor areas were due to be built with raised plinths, reinforced structures, wind- and flood-resistant materials, wide corridors, multiple exits, and designated assembly areas, with many coastal schools designed as dual-purpose cyclone shelters equipped with adequate ventilation, durable doors, water reserves, and emergency sanitation. WASH facilities including elevated toilets, raised tube wells, and accessible handwashing stations were designed to stay operational during floods and support gender-responsive hygiene. Infrastructure also embedded universal design features such as ramps, wide doorways, non-slip floors, and accessible latrines to ensure safe mobility for children with disabilities.

Our assessment identified a limited but significant implementation of the disaster-resilience infrastructure model across both flood- and cyclone-prone regions. In these areas, schools implemented simple but effective structural adjustments that minimised damage to educational resources. For example, in cyclone-prone regions, school buildings are specifically engineered to function as dual-purpose emergency shelters, utilising reinforced, heavy-duty materials to withstand high-velocity winds and extreme weather conditions. Conversely, in flood-affected areas, schools are strategically constructed on elevated foundations or pillars to ensure that the learning environment remains above the maximum recorded water levels, thereby protecting the facility from seasonal inundation and maintaining structural integrity during floods. In the extreme climate season, teachers routinely shift books, attendance registers, and other instructional materials to shelves installed high on classroom walls. One head teacher shared that this practice prevented the complete loss of materials during a recent flash flood when water entered classrooms and rose to knee level. Teachers also informed that WASH blocks and tube wells on raised platforms ensured that sanitation remained functional during waterlogging. While these resilient models are currently fewer in number, their existence demonstrates a viable standard for mitigating climate-related losses. Teachers and head teachers emphasised that these preparedness actions meant the school could continue learning during climate events and reopen quickly, as they did not have to wait for new learning materials or basic facilities to be restored. Teachers explained that during the floods and cyclones, children and

community members take shelter in these schools which enables children's safety and learning continuity together.

2. Strengthening school preparedness through safety planning and early warning mechanisms

Strengthening school preparedness under PEDP4 drew from the NPDM 2021-25 and SOD 2019, which collectively mandate that every educational institution maintain clear, actionable safety protocols and functioning early warning systems. It guides schools to develop and regularly update School Safety Plans, hazard maps, evacuation routes, and roles and responsibilities for teachers, students, SMCs, and community responders. These plans had to be practiced through periodic drills, ensuring that evacuation procedures, assembly points, and communication channels were familiar to all stakeholders. Aligned with SOD 2019, schools were integrated into the national early warning chain to receive timely alerts from local disaster management committees and relaying them quickly to parents and students through mobile communication, public miking, or community volunteers. This preparedness framework enabled schools to secure learning materials in advance, shift children to safe locations, and make early decisions about temporary closure or relocation of classes.

This rapid assessment found that 20.5% of surveyed climate-exposed schools took preparedness actions before disasters to reduce loss of schools and learners, and disruption to learning. Teachers described having established School Safety Plans outlining roles and actions during flood or cyclone seasons that helped them to conduct drills or orientation sessions before the monsoon period, ensuring that students and staff know how to move to safer areas and how learning materials should be secured. These schools also maintained active communication channels with local administrations. Around 71.5% schools informed that they maintained active communication and got an early warning message from the education office, Union Parishad, or community volunteers. For example, teachers in Mathbaria explained that early warning messages shared by Union Parishad officials and community volunteers allowed schools to close in an orderly way and shift instructional materials to safer locations before water levels rose. When early warnings were received, head teachers directed staff to move important registers, textbooks, and ICT materials to elevated storage and immediately inform students and parents about the schedule changes. Around 65.1% of head teachers informed that they shifted school materials to safe places after getting the early warning messages. All the teachers noted that they also disseminated the warning message to the students and their parents. This proactive communication reduced confusion, prevented material damage, and ensured that children remained aware of when and where learning would resume. The experiences show that structured planning, combined with timely warnings, allows schools to maintain continuity even when normal operations are interrupted.

3. Community and local government coordination for emergency readiness

The National Plan for Disaster Management (NPDM 2021–2025) and the Standing Orders on Disaster (SOD 2019) emphasise the need for an integrated, multisector coordination system linking schools, communities, education offices, and local government bodies to enhance emergency readiness. In line with these national directives, schools work closely with School Management Committees, parents, and community volunteers to implement safety plans, conduct evacuation drills, and secure learning environments, while Upazila and District Education Offices provide oversight, technical support, and communication pathways to disseminate early warning information. Local government institutions—particularly Union and Upazila Disaster Management Committees—issue hazard alerts, facilitate evacuation, activate cyclone shelters, and mobilise community resources when disasters strike.

Evidence from our assessment shows that such coordination is already practiced in Charfassion (Bhola), Borolekha (Moulavibazar), Golachipa (Patuakhali), and parts of Sunamganj, where teachers

described strong cooperation with Red Crescent volunteers, local youth groups, fishermen, and Union Parishad members well before disasters occur. This cooperation is also found in other upazilas as well. Around two-thirds of the schools reported that they had communication and coordination with local government and community people. These actors supported schools by sharing flood and cyclone forecasts, securing buildings, preparing shelters, and providing boats for safe transportation. This pre-established coordination reduced response time significantly and allowed schools to sustain learning activities with minimal disruption. The findings underscore that strong linkages between schools and local governance structures transform preparedness into a collective responsibility, enhancing both child protection and learning continuity during emergencies.

During-disaster

4. Using alternative safe spaces to sustain learning during extreme events

MoPME, in alignment with the National Emergency Preparedness and Response Plan, encouraged schools to utilise alternative safe spaces to sustain learning when classrooms became inaccessible due to floods, cyclones, or other hazards. These frameworks recognise that continuity of education requires flexible, community-based solutions during crises.

In practice, schools in areas such as Companiganj (Sylhet), Shalla (Sunamganj), and Amtali (Barguna) shifted classes to elevated community houses, raised embankments, cyclone shelters, or verandas of safe buildings that remained dry and accessible when school premises were inundated. In Companiganj, a teacher reported holding classes on the elevated veranda of a community member's home after classrooms were inundated. Students gathered in small groups in those alleviated places, allowing teaching to continue during the flood. In Shalla, where floodwater frequently isolates villages, teachers organised learning sessions along raised embankments that served as temporarily safe and dry areas. Similarly, in Amtali, cyclone shelters were routinely used as substitute classrooms whenever the school building became unsafe. These adaptive approaches ensured that children did not lose weeks of instruction during prolonged flooding or cyclone recovery periods. Teachers emphasised that although conditions were challenging, maintaining even a reduced learning schedule helped students retain engagement and prevented large gaps in literacy and numeracy skills that often occur when school closures are prolonged.

5. Flexible timetables and adjusted schedules during heatwaves and floods

In the post–COVID-19 context, national instructions and guidelines on Education in Emergencies in Bangladesh emphasise the importance of flexible timetables and adaptive scheduling to protect students' well-being while ensuring continuity of learning during heatwaves, heavy rainfall, flooding, and other hazards. These guidelines encourage schools to adjust operating hours such as shifting classes to early mornings during extreme heat or shortening the school day when flooding makes travel unsafe so that education can continue without compromising safety.

Evidence from several climate-affected schools illustrates the effectiveness of these adaptations. Teachers from Sylhet and Barishal regions explained that during intense heatwaves or periods of severe waterlogging, schools adopted flexible schedules that significantly improved attendance and student comfort. Morning-only sessions during heatwaves helped young learners avoid dangerous midday temperatures, making them more attentive and less fatigued. During the flood season, shortened sessions allowed students to return home safely before water levels rose later in the day. These adjustments enabled schools to sustain academic activities while safeguarding children's health, demonstrating that flexible timing is a practical and effective mechanism for preserving instructional time amid climate-related disruptions.

6. Community-provided transport and mobility support in haor areas

In haor-based upazilas such as Dowarabazar, Sunamganj Sadar, and Shalla of Sunamganj haor basin mobility becomes one of the most critical barriers to sustaining education during prolonged flooding, when roads and pathways remain submerged for weeks. Teachers reported that community members frequently stepped in to provide boats, enabling both students and teachers to reach alternative learning spaces or elevated locations where temporary classes were organised. A teacher from Shalla noted that, in the absence of boats, some students even swam part of the way through waist-deep water to meet teachers waiting on higher ground, demonstrating both the difficulty of access and the determination of learners. Community-supported boat services, however, significantly reduced these risks and improved attendance during the flood season. This local resourcefulness allowed schools to maintain a minimum level of instruction throughout months-long inundation. The evidence shows that when transportation systems collapse during disasters, community-led mobility solutions become essential for protecting learning continuity in remote haor environments and that needs to be considered in emergency response plans.

7. Psychosocial support provision for teachers and learners

According to Bangladesh Standards for Education in Emergencies, psychosocial support is recognised as a core component of the Education in Emergency framework, ensuring children's safety, well-being, and learning continuity during crises (INEE & Save the Children, 2015). The framework emphasises that students affected by disasters often experience fear, anxiety, and emotional distress, and that teachers play a frontline role in offering reassurance, stability, and a sense of normalcy, yet are also impacted with psychosocial distress during extreme weather events.

Consistent with these principles, teachers from schools in the Sylhet and Barishal regions reported that children frequently exhibited fear during extreme floods or cyclones. In response, teachers routinely began sessions by talking with students about their worries, checking on their safety, and incorporating informal play or storytelling to help them relax. These small but purposeful psychosocial practices helped children feel anchored and emotionally supported amid ongoing uncertainty. Teachers noted that early emotional reassurance enabled students to engage more effectively in learning activities, and in communities facing significant losses, such support was essential in preventing disengagement and potential withdrawal from schooling. Teachers themselves struggle with psychosocial well-being and stress resulting from disasters, impacting their ability to support learners. They benefited from school level peer support mechanisms. However, these mechanisms lack adequate standardisation and institutionalisation in supporting teacher well-being in crisis.

Post-disaster

8. Rapid needs assessment and immediate restoration enabling quick reopening

Guidance of the Bangladesh Standards of Education in Emergencies (EiE) Framework emphasises that schools need to conduct rapid needs assessments and initiate immediate restoration to ensure timely reopening after a hazard event. Consistent with these directives, all the head teachers in the surveyed schools across Barishal and Sylhet regions reported undertaking rapid assessments within 24 to 48 hours after floodwaters receded as per the direction from the District and Upazila Education Office. They evaluated building safety, WASH functionality, damage to the infrastructure and learning materials, while teachers simultaneously assessed student attendance and identified children at heightened risk of dropout. In line with national guidance on community engagement, School Management Committees and parents were mobilised for large-scale cleaning and repair. Head Teachers from Barguna reported that this coordinated effort allowed the school to reopen within two days of the cyclone Remal. Teachers explained that because materials had been safely stored before the disaster, classes could resume with minimal delay. This rapid recovery process prevented

extended closures that typically widen learning gaps and weaken re-enrolment. The evidence shows that when schools act swiftly and engage communities, reopening happens significantly faster.

9. Home visits, phone calls, and parental engagement to recover attendance

The Ministry of Primary and Mass Education highlights the importance of proactive parental engagement to prevent dropout and restore attendance following disasters. Consistent with these principles and guided by the education office, teachers in Patuakhali, Pirojpur, and Moulavibazar described actively reaching out to families whose children had not returned after floods or cyclones. Though these events were highlighted in some areas, however, all the head teachers of the surveyed schools reported that home visits, phone calls and parental engagement are part of their attendance and learning recovery efforts, and they do it after any major climate events. According to the teachers, many households faced significant disruptions including loss of livelihoods, damaged homes, or temporary displacement which made regular school attendance challenging. Teachers responded by conducting home visits, making phone calls, and counselling parents on the importance of re-enrolment and the support available at school. In Patuakhali, for example, a teacher recounted how several girls were at risk of not returning after their homes were damaged; through personal visits and reassurance about safety and travel arrangements, most of these students resumed attendance within days. This early, individualised follow-up prevented extended absenteeism and reduced the risk of dropout. The evidence demonstrates that schools that actively re-engage parents and maintain direct communication with families recover attendance more quickly and sustain continuity of learning after emergencies.

10. Remedial learning to address learning loss

National efforts led by MoPME, with support from development partners such as the European Union and the World Bank, have introduced remedial learning packages and teacher capacity-building initiatives to address learning loss—approaches that have become increasingly relevant in the post-COVID context and are now being applied in climate-affected areas. Teachers across both Sylhet and Barishal regions described using structured remedial and catch-up strategies to rebuild foundational skills among children who missed significant instructional time due to floods or cyclones. In Chhatak (Sunamganj), for instance, teachers organised group-based remedial classes for students who had been out of school for two to three weeks during flash floods, prioritising core competencies in reading and numeracy and breaking lessons into smaller, manageable segments. Similarly, in Amtali (Barguna), teachers conducted extra weekend sessions to help early-grade learners recover skills lost during cyclone-related closures. Teachers noted that small-chunk instruction reduced cognitive strain for children who were stressed or fatigued after disasters, allowing them to re-engage gradually. Head teachers in several upazilas emphasised the role of short, focused lessons paired with continuous formative assessments to monitor progress and adapt instruction. These strategies directly addressed the learning loss caused by disrupted schooling and were essential for restoring academic momentum and bringing students back to grade-level expectations.

11. Psychosocial reintegration to restore stability and learning readiness

As emphasised in Bangladesh's Education in Emergency framework, psychosocial support is a core component of post-disaster recovery, and teachers play a central role in helping children regain emotional stability once schools reopen. Reflecting this guidance, teachers in Sylhet and Bhola described intentionally creating nurturing and emotionally safe environments during the initial weeks after reopening. They incorporated play-based activities, informal storytelling, and opportunities for students to share their experiences of the disaster, helping children reconnect with peers and regain a sense of normalcy. These practices allowed students to gradually rebuild concentration and confidence, with teachers noting that children, particularly younger ones, were often distracted or

fearful without such psychosocial reintegration.

Across all cases, the data illustrate that schools in climate-vulnerable regions sustain learning continuity when they combine preparedness, adaptive teaching practices during crises, and active recovery strategies after disasters. These best practices demonstrate clear, locally proven approaches that can be scaled through PEDP5 to build a climate-resilient primary education system for Bangladesh.

CONCLUSION

This assessment demonstrates that extreme climate events now constitute one of the most persistent and systemic threats to learning continuity in Bangladesh's primary education system. The evidence from Barishal and Sylhet shows that the impacts of cyclones, floods, extreme heat, and prolonged waterlogging extend far beyond temporary disruptions to schooling. They erode instructional time, weaken foundational literacy and numeracy, heighten absenteeism and dropout, undermine students' emotional well-being, and exacerbate longstanding inequities—particularly for children with disabilities, students from poor households, and those living in hard-to-reach haor and coastal belts.

Despite these pressures, schools, teachers, students, and communities consistently demonstrated resilience and innovation. Teachers reorganised instruction into micro-chunks, relocated classes to verandas or embankments, used boats to reach children, provided emotional reassurance, and conducted home visits to bring students back. Communities supplied transport, cleared debris, and prepared cyclone shelters for use as temporary classrooms. Schools acted quickly after disasters to restore WASH, secure materials, and reopen—often well before formal support reached them. These practices underscore a critical insight: local actors are the backbone of education resilience, but their efforts remain largely informal, uneven, and dependent on individual initiative rather than system support.

The study also shows that while national policies and frameworks on Education in Emergencies, school safety, and disaster management are robust on paper, gaps in operationalisation undermine their effectiveness. Teacher shortages in disaster-prone schools persist year after year. Disability-inclusive design is inconsistent and often non-functional. Early warning systems and safety plans are present but unevenly practised. No structured approach exists for learning continuity during prolonged inaccessibility in haor areas, leaving the most vulnerable children entirely disconnected for months.

As Bangladesh prepares the Fifth Primary Education Development Program (PEDP5), these findings present both a warning and an opportunity. Climate change is accelerating, and the education system must shift from reactive coping to planned, institutionalised resilience. PEDP5 has the opportunity to embed the most effective local practices into national systems; to create functional mechanisms for emergency financing, teacher deployment, and disability inclusion; and to ensure that students in the poorest and most climate-exposed regions are never again left without a learning pathway.

Ultimately, this assessment affirms that climate resilience in education is not merely about protecting infrastructure—it is about protecting the continuity of learning, well-being, and opportunity for every child. A resilient education system is one that ensures that learning never stops, regardless of flood, cyclone, heatwave, or displacement. PEDP5 can—and must—build such a system by converting the lived practices of teachers and communities into policy-backed, adequately resourced national commitments.

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ANNEX I: RELATIONSHIP BETWEEN NUMBER OF DAYS SCHOOL WAS CLOSED AND NUMBER OF TEACHERS WITH BANGLA READING LEVEL

Descriptive Statistics

	Mean	Std. Deviation	N
Bangla Reading Level	4.55	1.302	2273
Number of days school was closed	22.21	17.985	2273
Number of teachers	4.00	2.843	2273

Correlations

		Bangla Reading Level	Number of days school was closed	Number of teachers
Pearson Correlation	Bangla Reading Level	1.000	-.334	.253
	Number of days school was closed	-.334	1.000	-.333
	Number of teachers	.253	-.333	1.000
Sig. (1-tailed)	Bangla Reading Level	.	.000	.000
	Number of days school was closed	.000	.	.000
	Number of teachers	.000	.000	.
N	Bangla Reading Level	2273	2273	2273
	Number of days school was closed	2273	2273	2273
	Number of teachers	2273	2273	2273

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Number of teachers, Number of days school was closed[b]	.	Enter

a. Dependent Variable: Bangla Reading Level

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.367[a]	.134	.134	1.212	.134	176.141	2	2270	.000	2.017

a. Predictors: (Constant), Number of teachers, Number of days school was closed

b. Dependent Variable: Bangla Reading Level

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	517.266	2	258.633	176.141	.000[b]
	Residual	3333.115	2270	1.468		
	Total	3850.381	2272			

a. Dependent Variable: Bangla Reading Level

b. Predictors: (Constant), Number of teachers, Number of days school was closed

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.711	.063		74.204	.000					
	Number of days school was closed	-.020	.001	-.281	-13.574	.000	-.334	-.274	-.265	.889	1.125
	Number of teachers	.073	.009	.159	7.701	.000	.253	.160	.150	.889	1.125

a. Dependent Variable: Bangla Reading Level

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Number of days school was closed	Number of teachers
1	1	2.411	1.000	.03	.04	.04
	2	.489	2.220	.00	.39	.28
	3	.100	4.902	.97	.57	.68

a. Dependent Variable: Bangla Reading Level

Casewise Diagnostics[a]

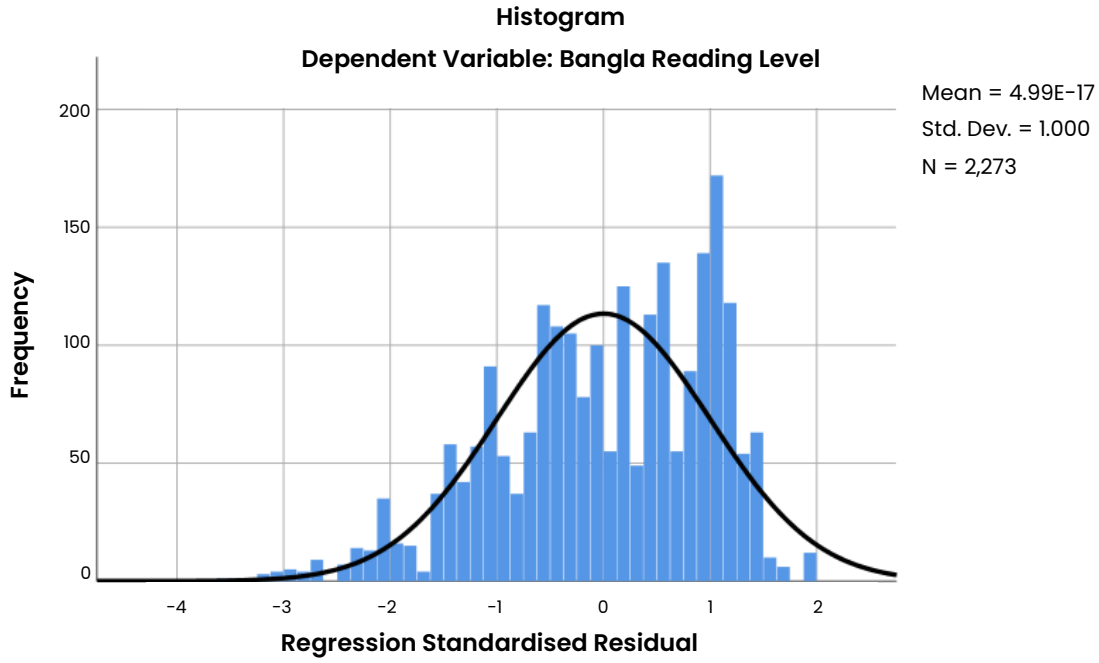
Case Number	Std. Residual	Bangla Reading Level	Predicted Value	Residual
328	-3.085	1	4.74	-3.739
409	-3.263	1	4.95	-3.954
561	-3.440	1	5.17	-4.168
1043	-3.186	1	4.86	-3.861
1826	-3.075	1	4.73	-3.727
1896	-3.548	1	5.30	-4.299
1925	-3.052	1	4.70	-3.698
1967	-3.052	1	4.70	-3.698
2347	-3.186	1	4.86	-3.861
2462	-3.186	1	4.86	-3.861

a. Dependent Variable: Bangla Reading Level

Residuals Statistics[a]

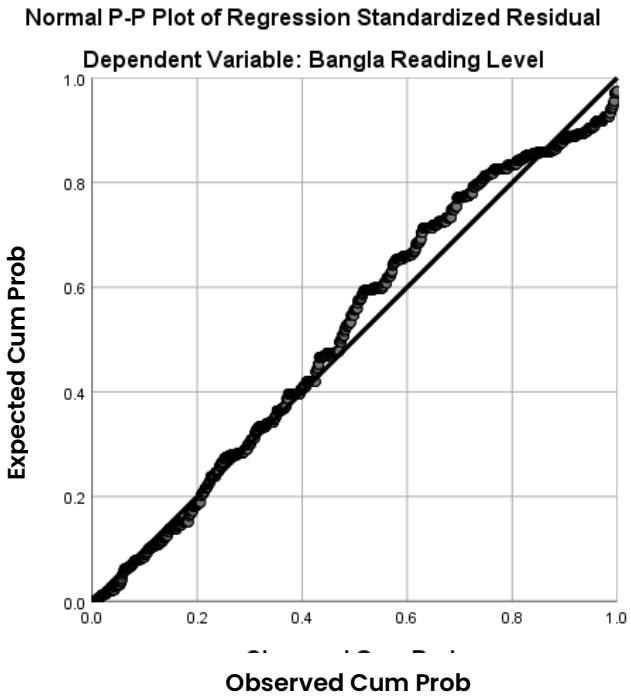
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.10	6.08	4.55	.477	2273
Std. Predicted Value	-3.043	3.201	.000	1.000	2273
Standard Error of Predicted Value	.026	.137	.039	.020	2273
Adjusted Predicted Value	3.09	6.09	4.55	.477	2273
Residual	-4.299	2.364	.000	1.211	2273
Std. Residual	-3.548	1.951	.000	1.000	2273
Stud. Residual	-3.552	1.953	.000	1.000	2273
Deleted Residual	-4.309	2.370	.000	1.212	2273
Stud. Deleted Residual	-3.561	1.954	.000	1.000	2273
Mahal. Distance	.017	28.230	1.999	4.491	2273
Cook's Distance	.000	.013	.000	.001	2273
Centred Leverage Value	.000	.012	.001	.002	2273

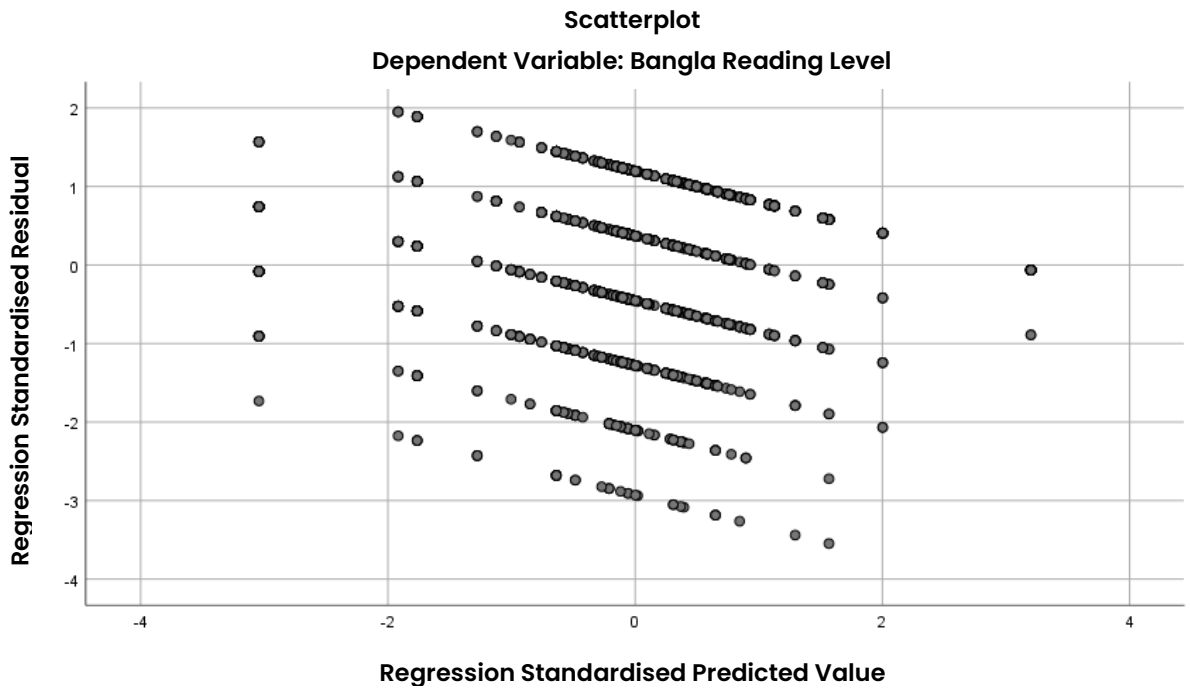
a. Dependent Variable: Bangla Reading Level



Normal P -P Plot of Regression Standardised Residual

Dependent Variable: Bangla Reading Level


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Bangla Reading Level
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: Bangla Reading Level
Regression Standardised Residual
Regression Standardised Predicted Value
2
1
0
-1
-2
-3
-4
4

ANNEX II: RELATIONSHIP BETWEEN NUMBER OF DAYS SCHOOL WAS CLOSED AND NUMBER OF TEACHERS WITH NUMERACY LEVEL

Descriptive Statistics

	Mean	Std. Deviation	N
Numeracy Level	4.82	1.318	2273
Number of days school was closed	22.21	17.985	2273
Number of teachers	4.00	2.843	2273

Correlations

		Numeracy Level	Number of days school was closed	Number of teachers
Pearson Correlation	Numeracy Level	1.000	-.224	.250
	Number of days school was closed	-.224	1.000	-.333
	Number of teachers	.250	-.333	1.000
Sig. (1-tailed)	Numeracy Level	.	.000	.000
	Number of days school was closed	.000	.	.000
	Number of teachers	.000	.000	.
N	Numeracy Level	2273	2273	2273
	Number of days school was closed	2273	2273	2273
	Number of teachers	2273	2273	2273

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Number of teachers, Number of days school was closed[b]	.	Enter

a. Dependent Variable: Numeracy Level

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.291[a]	.085	.084	1.261	.085	105.371	2	2270	.000	1.844

a. Predictors: (Constant), Number of teachers, Number of days school was closed

b. Dependent Variable: Numeracy Level

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	335.036	2	167.518	105.371	.000[b]
	Residual	3608.829	2270	1.590		
	Total	3943.864	2272			

a. Dependent Variable: Numeracy Level

b. Predictors: (Constant), Number of teachers, Number of days school was closed

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	4.710	.066		71.302	.000					
	Number of days school was closed	-.012	.002	-.159	-7.457	.000	-.224	-.155	-.150	.889	1.125
	Number of teachers	.091	.010	.197	9.261	.000	.250	.191	.186	.889	1.125

a. Dependent Variable: Numeracy Level

Collinearity Diagnostics[a]

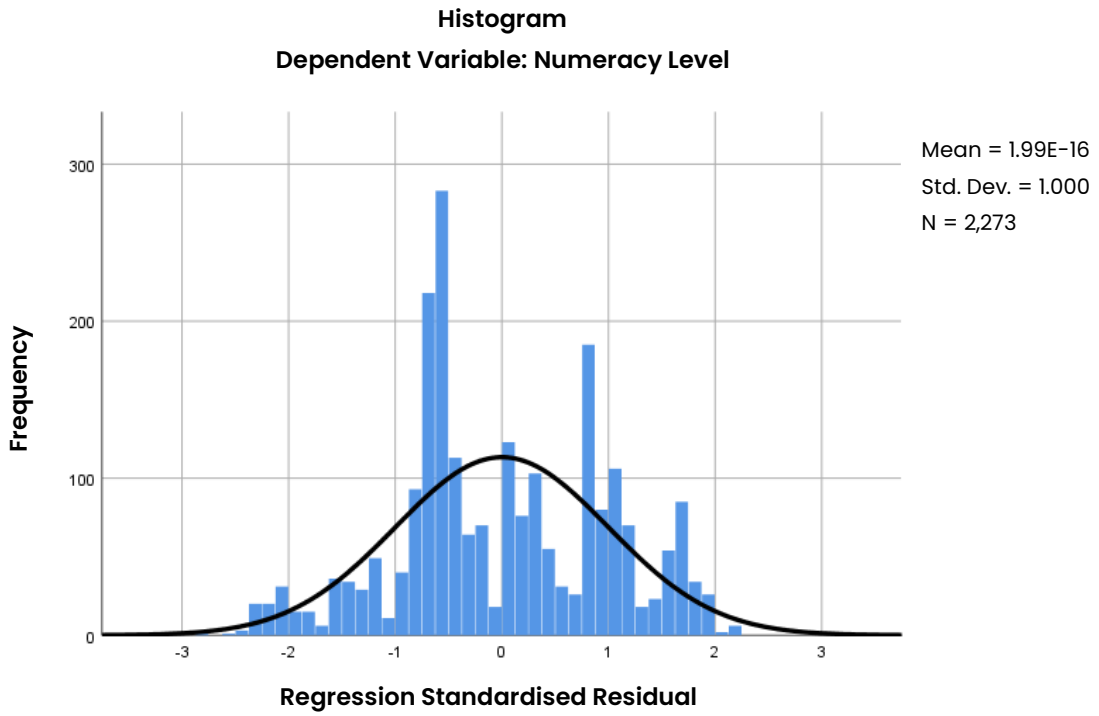
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Number of days school was closed	Number of teachers
1	1	2.411	1.000	.03	.04	.04
	2	.489	2.220	.00	.39	.28
	3	.100	4.902	.97	.57	.68

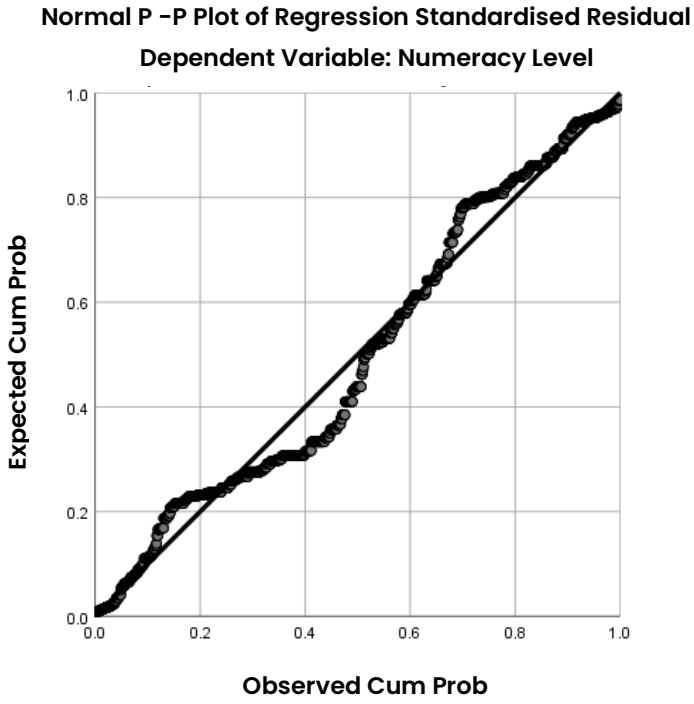
a. Dependent Variable: Numeracy Level

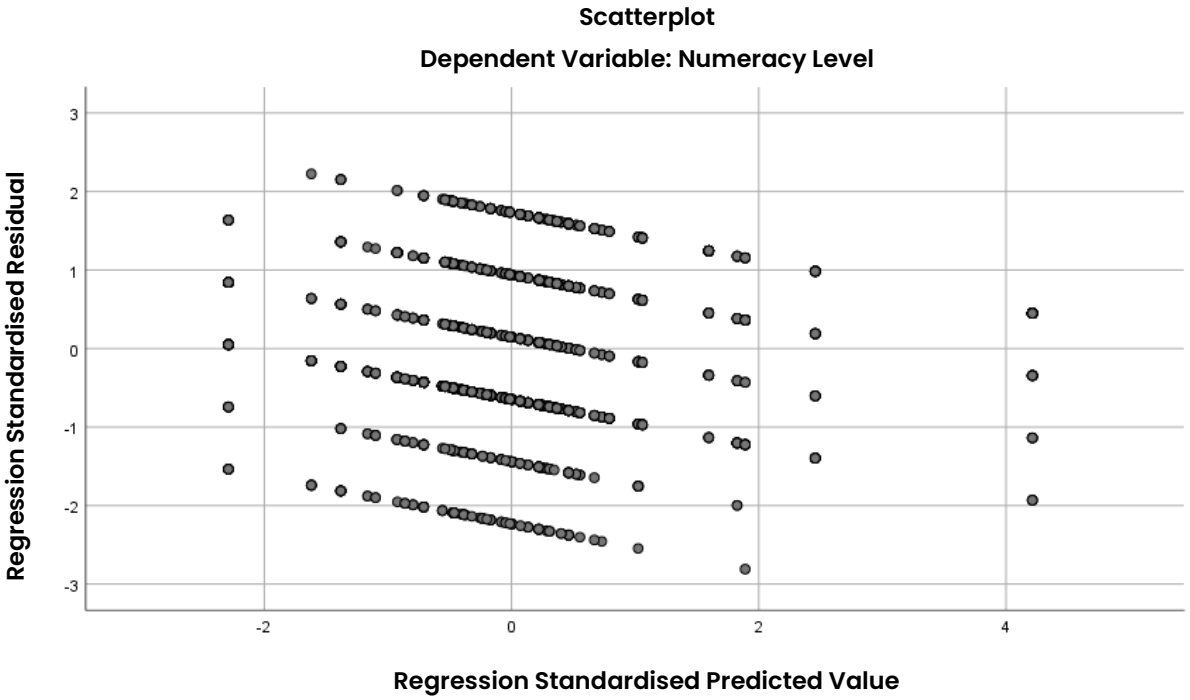
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.94	6.43	4.82	.384	2273
Std. Predicted Value	-2.290	4.213	.000	1.000	2273
Standard Error of Predicted Value	.027	.143	.041	.021	2273
Adjusted Predicted Value	3.92	6.47	4.82	.384	2273
Residual	-3.543	2.805	.000	1.260	2273
Std. Residual	-2.810	2.225	.000	1.000	2273
Stud. Residual	-2.813	2.227	.000	1.000	2273
Deleted Residual	-3.551	2.812	.000	1.262	2273
Stud. Deleted Residual	-2.817	2.229	.000	1.000	2273
Mahal. Distance	.017	28.230	1.999	4.491	2273
Cook's Distance	.000	.016	.000	.001	2273
Centred Leverage Value	.000	.012	.001	.002	2273

a. Dependent Variable: Numeracy Level


Histogram
Dependent Variable: Numeracy Level
Mean = 1.99E-16
Std. Dev. = 1.000
N = 2,273
Frequency
300
200
100
0
-3
-2
-1
0
1
2
3
Regression Standardised Residual


Normal P -P Plot of Regression Standardised Residual
Dependent Variable: Numeracy Level
Expected Cum Prob
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
Observed Cum Prob


Scatterplot
Dependent Variable: Numeracy Level
Regression Standardised Residual
Regression Standardised Predicted Value
3
2
1
0
-1
-2
-3
-2
0
2
4