



PREDICTORS OF EDUCATIONAL RESILIENCE IN FLOOD-PRONE PUBLIC SCHOOLS OF NASEERABAD DIVISION: A HIERARCHICAL MODEL

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Abstract

Flood-related disruption increasingly challenges schooling continuity in Pakistan, yet actionable school-level evidence on predictors of post-disruption recovery remains limited in many flood-prone districts. This study operationalized educational resilience as a continuity and recovery capability and tested a layered predictor model in public schools of Naseerabad Division, Balochistan. A cross-sectional questionnaire was administered to 80 schools (61.3% rural). Schools reported a mean of 7.29 closure days during the last flood event. Five multi-item indices were computed (structural resilience, institutional capacity, community engagement, psychosocial support capacity, and educational resilience), all showing high internal consistency (alpha range 0.955 to 0.971). Pearson correlations indicated that educational resilience aligned most strongly with structural resilience ($r = 0.48$) and institutional capacity ($r = 0.49$). In hierarchical regression, structural resilience explained 23.2% of variance in educational resilience, adding institutional capacity increased explained variance to 34.2% (delta $R^2 = 0.111$, $p = 0.001$). Community engagement did not add a significant increment (delta $R^2 = 0.014$, $p = 0.200$). Psychosocial support capacity contributed a further significant increment, yielding a final R^2 of 0.397 (delta $R^2 = 0.040$, $p = 0.029$). In the final model, structural resilience (beta = 0.37), institutional capacity (beta = 0.28), and psychosocial support capacity (beta = 0.21) were significant predictors. Findings support a sequenced planning approach that prioritizes safe-operational conditions and preparedness governance, while integrating psychosocial readiness to stabilize re-engagement after reopening.

Keywords

Educational resilience; flood disruption; school safety; preparedness governance; psychosocial support; community engagement; Pakistan

Introduction

Flooding has become a recurring stressor for Pakistan's public education system, disrupting schooling through infrastructure damage, prolonged closures, displacement, and interrupted service delivery (Government of Pakistan et al., 2022; Pal, 2023; Sujaya et al., 2023). Evidence on the sector level in the case of the 2022 floods in Pakistan shows that the disruption goes beyond direct physical destruction since inundation, displacement, and service disruption limit access and recoveries, mainly where local capacity is already low (Government of Pakistan et al., 2022). Schooling continuity is not a small operational problem in this regard. It acts as a buffer of children and predictor of the potential loss of learning, school dropout, and psychosocial suffering into consistent disadvantage in the long run (Ahmed et al., 2022; Gul et al., 2024; Pal, 2023). In education systems that keep seeing successive flood shocks, the practiceable concern is not one of whether schools are to reopen, but whether they reopen reliably and in enough amounts to resume usual learning procedures, re-establish fragile learners and make sure that preceding upheaval does not initiate all over; reusing ground at precursory stages (Gul et al., 2024; Sujaya et al., 2023).

Balochistan, and particularly the Naseerabad Division is a high -salience case involving exposure to flooding coupled with limited institutional capacity and disproportionate access to



services (Zaidi & Sultana, 2023; Imran, 2022). Even though the flood-education literature in Pakistan is growing, there is still a disproportionate amount of evidence available in various provinces, with relatively less peer-reviewed evidence of post-flood continuity processes in Balochistan than in others (Arif et al., 2025; Pal, 2023). Recent qualitative research in Balochistan, affected by floods, illustrates that the lack of continuity and resources, as well as undermined support systems, compel teachers to make improvised continuity plans, not to mention how teachers may cope with their own stress and disruption of their households (Arif et al., 2025). This local fact reinforces the call to empirical work which would explicitly operationalize broad commitments of resilience into measures at the level of schools in flood prone places where there are fiscal imperatives to make prioritisation decisions.

This paper will define educational resilience as the ability of the school to continue teaching and regain learning facilities after the disruption by floods. The construct is operationalized by having a continuity and recovery index, which measures concrete post-disruption measures and activities, such as quick resume of instruction, temporary learning set-ups, family communication during closures, learning recovery plans, and attendance recovery. This definition treats resilience less as a motivational slogan and more as an observable capability: a set of practices that can be strengthened through policy, resource allocation, and management reforms (Imran, Akhtar, & Khan, 2026; Zaidi, et al., 2024). The resilience scholarship of adaptive functioning based on ordinary modifiable protective processes, as opposed to exceptional traits, is consistent with the framing (Masten, 2001). It is also in line with empirical studies in Pakistan that conceptualize education-sector resilience as a multidimensional and measurable construct that comprises physical circumstances, human resources, institutional concerns, and external ties (Shah et al., 2020).

The study predictor structure is specifically adjusted to the conceptual school safety and education-in-emergencies architecture though it is also premised on the peer-reviewed evidence that preparedness and continuity are not units but stratified results. For example, evidence from flood-prone districts in Pakistan documents persistent preparedness gaps in planning, continuity of operations, evacuation readiness, resources, and psychological first aid, even where schools face repeated hazards (Shah et al., 2018). Complementing this, recent work on disaster risk reduction education in Pakistan underscores implementation constraints related to policy clarity, teacher competence, materials, partnerships, resourcing, and inclusion of children's voices, all of which shape the feasibility of school-based continuity practices (Shah, Khan, et al., 2024). Together, this literature implies that educational continuity after floods is rarely explained by one domain. It is more plausibly explained by layered capacities that begin with minimum safe-operation conditions and extend to governance, community linkages, and the psychosocial climate needed for re-engagement and attendance recovery (Pal, 2023; Shah et al., 2018).

Accordingly, this study models educational resilience as a function of four actionable school-level domains measured using a structured questionnaire designed for flood-affected public schools in Naseerabad Division. The first domain is **structural resilience**, defined as the physical safety and functional adequacy of learning facilities and essential resources that reduce disruption severity and enable rapid reopening. Evidence from Pakistan indicates that shortcomings in safe facilities, emergency equipment, and basic preparedness resources undermine the ability to reopen quickly and safely, even when exposure is well known (Shah et al., 2018). The second domain is institutional capacity, defined as preparedness planning, role clarity, drills, coordination, record protection, and structured reopening procedures, in effect, the managerial and procedural spine of continuity. Planning and continuity-of-



operations are the main weaknesses determined in Pakistan based on the empirical research and imply that hardware is not continuous unless it is facilitated by an institutional routine (Shah et al., 2018; Shah et al., 2020). The third area is community engagement which refers to family and community involvement in preparedness, communication, local coordination, and the capacity to mobilize the support to restore attendance and provide temporary learning demands (Imran, Khan, & Rani, 2025; Imran, Sultana, & Jat, 2023). The community-related recovery process can be traced to post-flood Pakistan where the localized self-help and informal support may be applied to compensate the slowdown in reconstruction and lack of resources, including schooling of girls in flood-impacted districts (Gul et al., 2024; Chidambaram and Khalid, 2024). The fourth domain is psychosocial support capacity, defined as the presence of supportive practices, trusted adults, referral pathways, basic psychological first aid orientation, and stigma prevention within the school environment after disruption. The field has empirical salience since the learners with flood-related experiences report anxiety, signs of fear, depression, and interrupted motivation that could have a direct impact on the restoration of attendance and classroom involvement (Gul et al., 2024). More broadly, evidence syntheses show that school-delivered mental health and psychosocial support can reduce post-trauma and other mental health symptom burdens among children and adolescents in low- and middle-income settings, strengthening the plausibility of psychosocial capacity as an independent contributor to educational continuity (Bangpan et al., 2024; Grande et al., 2023; Harte & Barry, 2024). Beyond this, studies into post-disaster role of teachers underscore the importance of teachers acting as front-line relationship resources influencing the processes of safety, belonging, and coping which are processes that are directly related to reintegration and continuity following a disruption (Parrott et al., 2025).

The main analytical aspect of the study is the order in which the predictors are keyed in a theory-based order. Particularly, the main model applies hierarchical multiple regression in four blocks, including structural resilience, institutional capacity, community engagement, and psychosocial support capacity (Khosro, et al., 2024; Sultana & Imran, 2024; Ahmad, Bibi & Imran, 2023). This prioritization derives out of a practical planning reasoning that has Pakistan-based evidence. Schools transform facilities into coordinated preparedness and reopening activities through institutional systems, whereas the minimum viable operating environment is established by structural conditions (Shah et al., 2018; Shah et al., 2020). Engaging the community can expand capacity by means of communication, local coordination, and mobilization to restore attendance (Gul et al., 2024). The last indicator to be entered is psychosocial support capacity to determine whether, when other factors have been controlled (facilities and procedures), the continuity and recovery practices exhibiting unique variation are still attributable to the recovery climate. This is not a statistical convenience. It is an assertion as to what will be foundational as compared to additive in precarious situations: a school may have a building, but without procedures it will lack reliability; it can have procedures, but without community linkages it lacks surge capacity; and it can have both, but without psychosocial readiness it may still struggle to re-stabilize engagement and attendance among affected learners (Bangpan et al., 2024; Shah et al., 2018).

Study contributes in two ways. First, it offers a context-specific measurement package that translates established frameworks into school-level indicators appropriate for flood-prone public schools in Naseerabad Division, while remaining consistent with peer-reviewed evidence on preparedness, DRR education constraints, and resilience measurement in Pakistan (Shah et al., 2018; Shah, Khan, et al., 2024; Shah et al., 2020). Second, it provides a prioritization logic for district planning by identifying which domains explain incremental



variance in educational resilience and where potential capacity gaps may be concentrated across schools. Pragmatically, the paper will seek to assist decision makers in responding to a perennial post flood question with empirical rigor; what should be reinforced first, what may be overlaid next, and what kinds of soft capacities are important even in the presence of physical and procedural fundamentals.

Study Objectives

1. Rationale: Education flexibility as permanency and recovery index is an operational measure to gauge the speediness of flood prone schools.
2. To approximate the families under operation elasticity, institutional capacities, meeting of communities, psychosocial supports capacity, and educational resiliency.
- 3. To assess the predictive increment of blocks of predictor by hierarchical lapse methodology school safety and education-in-emergencies rationale.**

Hypotheses

H1: Educational resilience is positively related to structural resilience.

H2: Institutional capacity is an additional factor in explaining educational resilience after structural resilience.

H3: Community engagement explains additional variance beyond structural and institutional domains.

H4: Psychosocial support capacity explains additional variance beyond structural, institutional, and community domains.

1. Literature Review and Conceptual Framework

1.1. Educational resilience in flood-disrupted schooling

Educational resilience has increasingly been treated as a systems property rather than an individual trait. In resilience science, adaptive functioning is commonly framed as “ordinary” and policy-relevant: it emerges from modifiable protective processes, not exceptional heroism (Masten, 2001). Applied to schooling in hazard settings, this shifts attention from whether disruptions occur (they will), to whether schools can maintain core functions and restore routines fast enough to prevent transient shocks from becoming chronic educational loss (Pal, 2023; Shah et al., 2020).

Floods are a particularly disruptive hazard for school systems because they damage facilities, cut access routes, displace households, and interrupt service delivery simultaneously (Lassa et al., 2023; Pal, 2023). In Pakistan, peer reviewed evidence after the 2022 floods reports compounded effects on education access, learning continuity, and wellbeing, including heightened vulnerability among already marginalized learners (Chidambaram & Khalid, 2024; Gul et al., 2024; Sujaya et al., 2023). It has direct implications on research design: the construct of educational resilience must be operationalized as observable continuity and recovery capacity on the school level, and not as an idealized goal (Shah et al., 2020).

In this paper, the concept of educational resilience is operationalized as a quantifiable continuation and recovery measure, grounded in the tangible school practices, which include quick reinstatement of learning, temporary school learning, learning recovery planning, restoration of learning, restoration of attendance, communication with family, and learning loops. In principle, the position of this outcome as a composite capability influenced by the stratified spheres of preparedness and assistance is aligned with all-hazards strategies in reducing the risks of the education sector (GADRRRES, 2022; INEE, 2024).

1.2. Structural resilience: safe learning facilities as the operating baseline

CSSF considers safe learning facilities as one of the pillars of protecting the learners, as well as facilitating continuity (GADRRRES, 2022). It is not limited to logic based on building



strength in the narrow engineering definition. It includes functional safety and adequacy of operations: functionality of WASH, safe access, safe storage and learning spaces, all of which are decisive factors on whether a school can reopen safely and whether it can remain open/functional for an extended period during rainy seasons. This also matches well with the School Safety Framework (PSSF) in Pakistan, as it offers the countrywide guidelines to help entwine disaster risk reduction to the school systems and procedures, as well as the risk assessment of the facilities and preparedness (NDMA, 2017).

Empirical work from Pakistan reinforces the practical importance of this baseline. Studies of flood-affected schools in Khyber Pakhtunkhwa describe how exposure interacts with facility constraints and the surrounding environment to amplify risk and slow recovery, especially where protective measures and maintenance are weak (Shah et al., 2018). There is also evidence demonstrating the use of CSS lenses to demonstrate that floods interfere with the quality of education and recovery by affecting the learning spaces, services, and conditions that promote the stability of the instruction (Lassa et al., 2023). The corresponding inference to a predictor model is restricted but significant: structural resilience is a plausible cause of initial variance in continuity since, in the absence of minimum safety and usability, planning and pedagogy do not have much room to work (Shah et al., 2018).

The structural resilience is measured in the Current study measurement package using those items which represent physical safety and functional resources (safe classrooms, WASH continuity, protected storage, safe access routes, electrical safety, and temporary learning space). These indicators are aligned with CSSF and PSSF facility logic while remaining narrow enough to be actionable at district planning level (GADRRRES, 2022; NDMA, 2017).

1.3. Institutional capacity: preparedness, governance, and coordination as continuity infrastructure

Where structural resilience establishes feasibility, institutional capacity determines reliability. Both CSSF and PSSF emphasize school disaster management elements such as contingency planning, role clarity, drills, coordination with authorities, and preparedness procedures that translate risk awareness into operational response (GADRRRES, 2022; NDMA, 2017). In education-in-emergencies doctrine, preparedness and response quality are similarly treated as determinants of whether access to safe learning can be restored quickly and equitably (INEE, 2024).

Pakistan-specific evidence illustrates the implementation gap this domain is intended to capture. In the flood-affected schools in Khyber Pakhtunkhwa, preparedness activities seem to be uneven, and institutional arrangement is informal or inconsistent, which reduces the effectiveness of early warning, evacuation readiness, communication with parents, and reopening in an organized manner (Shah et al., 2018). To add to this, a study of disaster risk management in the same province identifies how governance practices and coordination practices condition the initiation of preparedness as a functioning system instead of compliance paperwork (Shah et al., 2020). The scaling constraints associated with policy clarity, the ability of the teachers, resourcing, and local relevance are also listed in recent DRR education practice in Pakistan as institutional constraints that affect continuity viability across hazard cycles (Shah et al., 2024).

In Current study, the concept of institutional capacity is operationalized through the assistance of items indicating the so-called spine of readiness written plans, assigned roles, evacuation paths, drills, updated contact list, coordination with district offices, recoverable record keeping, and structured reopening procedures (Danish, Akhtar & Imran, 2025; Mankash, et al., 2025; Hafeez, Yaseen & Imran, 2019). The theoretical hypothesis is that the institutional capacity is



anticipated to forecast the incremental variability in the educational resilience among the structural conditions because of the reality that it controls mobilization of accessible resources in case of time strain and uncertainty (Shah et al., 2018; Shah et al., 2020).

Community engagement: partnership capacity and local surge support

The school rarely undertakes delivery of school continuity after floods. The community can play a life-saving role in the overloaded public systems: informational communications, volunteer work to clean up and do small repairs, family support to continue learning during shutdowns, and neighbourhood organizing to accomplish the restoration of attendance (Imran, Akhtar, & Khan, 2026; Haider, et al., 2025). The partnership model created by Epstein comes in handy in this case since it considers school-family-community interaction as an organized aspect of school performance rather than a public relations extension (Epstein, 2002). Syntheses of community-based disaster education also state that engagement based interventions can strengthen resilience functions including resilience of teachers and preparedness capacity of a local community when integrated into larger community systems (Fu and Zhang, 2024).

Education-in-emergencies Community engagement is another safety intervention and access intervention: it may assist in locating missing learners, minimizing the dropout risk, and harmonizing local norms with safe return to school (INEE, 2024). After the 2022 floods in Pakistan, qualitative and district-level studies indicate that household shocks and social constraints might be used to increase the risks of exclusion (especially among girls) by enabling community-related attendance restoration and protective follow-up critical for preventing permanent disengagement (Chidambaram & Khalid, 2024; Gul et al., 2024).

1.4. This paper bases its community engagement model on the indicators that are operational and measurable: regular communication with parents about safety and continuity, community support of protective measures and minor repairs, committee involvement in preparedness decision-making, cooperation with local leaders to reestablish attendance, dropout-risk follow-up systems, parent support of home learning routines during closures, mobilization of local resources quickly, and local trust. It is additive: community engagement is expected to account for extra variance on top of structural and institutional domains since it provides local implementation bandwidth and enhances the rate of attendance and participation re-stabilization following the disruption (Fu & Zhang, 2024; Gul et al., 2024).

1.5. Psychosocial support capacity: protective learning environments and re-engagement

The only problem of continuity is facilities-and-plans problem. The returns after floods are normally marked by distress, concentration, fear, stigma on the affected learners and teacher fatigue. The education-in-emergency standards specifically consider safe, inclusive, protective learning environments as the primary quality requirements of sustained access and meaningful learning at the times of crisis cycles (INEE, 2024). This practical argument can be explained by the INEE framing and can be implemented into the model order of the current study: the learning recovery can be weak even in case a school has been reopened early, unless students and teachers will return to their workplaces without basic psychosocial support and predictable schedules (Grande et al., 2023; Heltne et al., 2020). The post-disaster psychosocial and school-based support evidence base has not reached perfection level, but it is well developed enough to support the idea of measuring the capacity instead of clinical outcomes on school surveys. The reviews of post-disaster psychosocial interventions among children and adolescents demonstrate inconsistencies with a positive overall outcome, heterogeneity, and methodological limitations (Gibbs et al., 2021; Bangpan et al., 2024). Psychosocial support and supportive practices in schools are commonly proposed as the potential forms of psychosocial help in case of emergency education, particularly when the assistance of specialists is inaccessible (Grande et al., 2023; Heltne et al., 2020). The support is termed as humane, culturally respectful, and non-clinical, which is a state of



psychological first aid (PFA) practical guidance, which fits the capacity orientation of this study instrument (World Health Organization, 2011). Disaster preparedness interventions that are teacher-centered also present precedent to capacity-based psychosocial preparedness work through schools (Elangovan and Kasi, 2015). The interest in teacher and school psychosocial resilience after the 2022 floods in Pakistan and Balochistan is also promoted by the scholarship on Pakistan and Balochistan. Balochistan records show how teachers managed to adapt to displacement and resource deprivation and keep education going and note how the community and institutions assisted them in deciding the type of post-disruption schooling (Arif et al., 2025). The role of teachers in post-disaster work at the international level is also evidenced, which puts teachers in the category of relational resources in terms of psychosocial recovery and re-stabilization, which contributes to the theoretical suitability of psychosocial capacity as a specific predictor of continuity results (Parrott et al., 2025). Its consequence on a predictor model thus is indirect: the psychosocial support ability is not meant to substitute infrastructure and preparedness but to introduce extra explanatory power because it will enable re-engagement, classroom stability, and continued attendance once schools reopen (Bangpan et al., 2024; Gibbs et al., 2021). In Current study, the psychosocial support capacity is defined as a domain of school capability as opposed to a domain of clinical diagnosis. One of them is the ability of educators to notice distress signs, the post-disruption delivery of supportive actions, the existence of trustworthy adults, referral options, any orientation to the psychosocial support or PFA, antimisogynistic and ant stigmatization interventions, the practices of classroom that support calm engagement, and parent engagement with the problem of wellbeing.

Such a specification agrees with the protective environment component of INEE but is practical in a survey at the school level (INEE, 2024; World Health Organization, 2011).

1.6. Conceptual model and hypotheses

Putting the two above together, the conceptual framework conceives educational resilience as a result of stranded capacities which may be operationalized in terms of district planning. It is not due to reasons of competition but due to a succession reason:

1. The structural resilience provides the safe and realistic conditions of learning that reduce the level of interruption, and it is possible to reopen (GADRRRES, 2022; Shah et al., 2018).
2. The institutional ability will turn the feasibility into the plausible action preparing routines, coordinating, and organizing reopening (Shah et al., 2018; Shah et al., 2020).
3. The community response makes the locally available surge capacity better and improves the communication and attendance recovery system (Fu and Zhang, 2024; Gul et al., 2024).
4. The operational balance of re-entry, assigning, and classroom after the disruption and the encouragement of expressive continuation of learning as opposed to saving in name only is achieved with the assistance of the psychosocial funding bulk (Bangpan et al., 2024; Gibbs et al., 2021; INEE, 2024).

The very design has a direct impact on the main procedure of analysis of Current study: hierarchical regression, according to which the predictors will be presented in the order in which they appear in the theory: the structural, then the institutional, and the community, and the psychosocial support.

. The model tests whether each domain explains incremental variance in the Educational Resilience Index after accounting for domains that are plausibly more foundational.

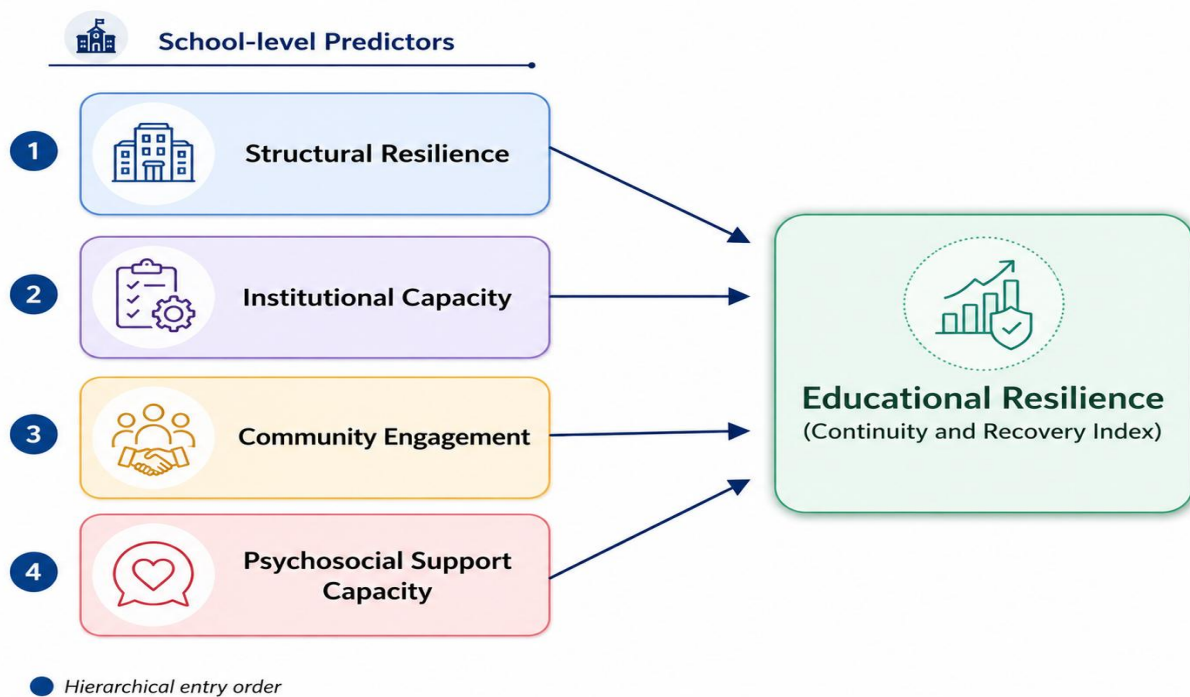


Figure 1: Conceptual model of educational resilience and its school-level predictors

Figure shows Educational resilience (Continuity and Recovery Index) that is specified as the outcome and is predicted by four domains: Structural Resilience, Institutional Capacity, Community Engagement, and Psychosocial Support Capacity. Predictors are entered conceptually in a hierarchical order reflecting a foundational-to-additive planning logic (structural first, then institutional, then community, then psychosocial). All constructs are operationalized as mean scores of their respective item sets: Structural Resilience (SR1–SR8), Institutional Capacity (IC1–IC8), Community Engagement (CE1–CE8), Psychosocial Support Capacity (PS1–PS8), and Educational Resilience (ER1–ER8).

2. Methods

2.1. Study design and setting

It was a cross-sectional study with a study design of a questionnaire to estimate the school-level predictor of educational resilience of flood-prone public schools in Naseerabad Division in the province of Balochistan. Cross sectional surveys may be employed to estimate associations between constructs of interest, in addition to being able to offer policy-relevant baseline data in a setting where longitudinal monitoring is operationally unfeasible (Creswell and Creswell, 2018). It is policy-specifically designed: the school-based safety and education-in-emergencies guidance is translated into measurable areas of schools that may inform the decisions on sequencing in the district after repeated flooding (Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector [GADRRRES], 2022; International Network for Education in Emergencies [INEE], 2024). It was also identified that the reference period ought to be the last 12 months and the last period of floods to ensure that the answer is informed by current working realities and not the institutional long-term memory (Dillman et al., 2014). The analytic unit was specified as the school, consistent with the paper’s planning logic and the intended use-case (district-level prioritization). When multiple respondents per school are available, the preferred approach is to aggregate construct scores to the school level



using interrater agreement checks, or to apply clustered or multilevel estimation where aggregation is not justified (Bliese, 2000; Hox et al., 2018; James et al., 1984).

2.2. Participants and sampling

The target population included flood affected public schools of Naseerabad Division. The intended primary respondent was the head teacher, who was in a position to report on conditions of facilities, preparedness routines, community linkages and continuity practices throughout modules. Teachers were also able to respond, especially for modules that require information on a class level. A student add-on module was defined as optional and should be administered only if the study aims to capture perceived psychosocial climate or continuity experience from learners, not to replace school-level reporting (Creswell & Creswell, 2018). Sampling should be reported transparently based on the actual field implementation. If schools were selected purposively, the manuscript should state the selection criteria (for example, flood exposure history, accessibility, school level mix) and justify how these criteria align with the study's policy objective (Patton, 2015). If a stratified approach was used, strata should be stated explicitly (for example, rural versus urban, primary versus secondary), consistent with survey sampling best practice for improving representativeness on known design factors (Lohr, 2019). The manuscript is also required to report on the sample size obtained, school level response rate and any form of nonresponse that could bias estimates (Groves et al., 2009).

2.3. Instrument development and alignment to frameworks

A questionnaire was made into a structured questionnaire that operationalized educational resilience and its predictors as domains of school capacity that could be modified. The content of items was informed by a convergence of frameworks as opposed to being verbatim copied by any individual tool. Specifically, structural resilience and institutional capacity were aligned with the "safe learning facilities" and "school disaster management" pillars of the Comprehensive School Safety Framework and their operationalization in the Pakistan School Safety Framework (GADRRRES, 2022; National Disaster Management Authority [NDMA], 2017). Community engagement items were informed conceptually by school-family-community partnership logic and existing partnership measurement traditions, adapted to the flood continuity context (Epstein, 2002). Psychosocial support capacity was framed as a school capability domain, consistent with education-in-emergencies standards emphasizing protective, inclusive learning environments during preparedness, response, and recovery (INEE, 2024).

The structure of the instrument was designed in modules: school profile module (non-scored), predictor modules 4, and one module for the outcome of resilience in school. The default format for response items for scored items was a 5-point Likert scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Likert-type scaling is common in measurement of latent capacity constructs, especially when the approach to analysis is based on aggregate indices and evidence of internal consistency (DeVellis, 2017).

2.4. Measures and scoring

School profile variables (Module A, non-scored). The questionnaire captured contextual characteristics used for description and optional covariate adjustment: school level (primary, middle, secondary, higher secondary), location (rural, urban, peri-urban), flood exposure in the last three years (none, once, twice, three or more), days closed during the last flood event, and building type (single-storey, multi-storey, mixed). The variables are substantively relevant because they provide information on exposure, recovery limits, and continuity viability and allow exposure to be viewed on a fair footing by school type (Lohr, 2019; Patton, 2015).



Structural resilience (Module B). Structural resilience measured physical safety and minimum functional adequacy that may decrease the level of disruption and aid in opening. Things included structural safety of classrooms, drinking water and WASH functionality continuity, accessible routes to be used, safeguarded storage of materials and records, substitutability of learning resources, electrical safety during waterlogging, and temporary learning should have a designated safe area in the case of inaccessibility of a room. To get the scale score, the mean score of SR1 to SR8 was determined. Mean indexing also can be applied to the case of the similarity of items and they are expected to measure a consistent domain provided reliability and construct evidence is reported (DeVellis, 2017).

Institutional capacity (Module C). Institutional capacity was determined in terms of preparedness governance, operational preparedness in terms of availability of written contingency plan, assignment of roles, evacuation routes and assembling points, drills, current contact list, coordination with district authorities, recoverable recordkeeping and systematic reopening processes after disruption. An average of IC1 to IC8 was done as the score of the scale (DeVellis, 2017).

Community engagement (Module D). Community engagement represented relative participation and local coordination, which were relative to continuity and quick recovery, including frequent contact with parents, community support of protective measures, the committee in the preparedness process, community involvement in a recovery process of restoring attendance, dropout-at-risk follow-up, parent support of home learning life during closures, local mobilization of resources quickly, and community trust that facilitates participation. The score of that scale was calculated as the average of CE1-CE8 (Epstein, 2002; DeVellis, 2017).

Psychosocial support capacity (Module E). The capacity of psychosocial support was a school level ability, rather than a clinical screening construct. Items evaluated perception of ability to recognize distress, the availability of supportive routines following the disruption, presence of trusted adults, referral routes, any orientation to psychosocial support or psychological first aid, anti-stigma practices, routines in the classroom that facilitate relaxing engagement, and parent involvement on wellbeing issues when necessary. The scale score was computed as the mean of PS1 to PS8 (INEE, 2024; World Health Organization, 2011).

Educational resilience outcome (Module F). The dependent variable, Educational Resilience Index, captured continuity and recovery practices at the school level. Items included rapid resumption of instruction after basic safety restoration, temporary learning arrangements if buildings are unusable, learning-loss compensation strategies, attendance recovery, communication with families during closures, continuity actions for vulnerable learners, recovery or replacement of learning materials, and post-season learning loops that improve preparedness. The index score was computed as the mean of ER1 to ER8 (GADRRRES, 2022; INEE, 2024).

2.5. Data collection procedures and quality assurance

Field administration procedures should be reported exactly as implemented. The study protocol defines a single instrument to be administered to the primary respondent (head teacher preferably) with the defined 12-month reference frame. To enhance the reliability of the measurements, a staged quality approach is employed in that is: content validation through expert review, clarity and contextual fit of the measurements during pilot testing, and internal consistency of the measurements during analysis. These steps are consistent with recommended guidelines for developing scales and carrying out surveys in applied programs (DeVellis, 2017; Dillman et al., 2014). Where possible, the manuscript should describe training



procedures for enumerators or focal persons (where used), actions taken to minimize the possibility of social desirability (e.g., assuring confidentiality, neutral administration) and checks made during data entry (e.g., range checks for Likert responses, checking for missingness) (Groves et al., 2009).

If multiple respondents from each school were collected, then the manuscript should indicate whether the response was aggregated or not and how the decision was made. A defensible approach is to compute within-school agreement (for example, *rwg*) and/or intraclass correlations, then aggregate when agreement supports school-level inference (Bliese, 2000; James et al., 1984). If agreement is weak or respondent roles vary substantially, cluster-robust standard errors or multilevel modeling should be used to preserve valid inference under non-independence (Cameron & Miller, 2015; Hox et al., 2018).

2.6. Data preparation

Items were coded on a 1 to 5 scale, with higher scores representing stronger capacity. Prior to scoring, data should be screened for out-of-range values, excessive missingness, and straight-lining patterns where applicable (Dillman et al., 2014). Construct scores were computed as mean scores across items within each module, producing four predictor indices (SR, IC, CE, PS) and one outcome index (ER). Mean scoring is appropriate when all items are on a common metric and are designed to represent a coherent domain, but reliability evidence must be reported to support this assumption (DeVellis, 2017).

Missing data handling should be specified a priori. A standard approach for school surveys is to compute a scale score when a respondent completes at least 80% of items within that scale, imputing remaining missing items using the person-mean within that scale, and coding the scale missing otherwise. The manuscript should report the proportion of missingness per item and per scale and confirm that results are robust to reasonable alternatives (for example, listwise deletion versus within-scale imputation), particularly if missingness is patterned by location or school level (Enders, 2010).

2.7. Statistical analysis

The analyses are to be conducted in a sequence that reflects the conceptual model and allows making inferences transparently.

Measurement quality. Each multi-item scale must be tested with regard to internal consistency using the Cronbach alpha (Cronbach, 1951) and, when feasible, omega by McDonald, to minimize the use of tau-equivalence (Dunn et al., 2014; McDonald, 1999). Factor structure should be assessed with exploratory factor analysis, and confirmatory factor analysis if sample size and model complexity permit, to evaluate whether predictor domains and the outcome index are empirically distinguishable (Fabrigar et al., 1999; Kline, 2016). The manuscript should report extraction method, rotation, factor retention logic, and loading thresholds and full loading tables should be relegated to the appendix section, if journal space is tight (Fabrigar et al., 1999).

Descriptives and group situation Means, standard deviations and domain profiles should be presented overall and by important school features (for example, location and school level). Group comparisons need to be performed using t-tests or ANOVA as appropriate, with effect sizes (Cohen's *d* or eta squared) in order not to rely too much on p-values (Field, 2018).

Primary model: hierarchical multiple regression. The fundamental hypothesis test is based on hierarchical multiple regression accompanied by theory-based block entry analysis, which involves Step 1 structure resilience, Step 2 add institutional capacity, Step 3 add community engagement, Step 4 add psychosocial support capacity. Thus, each step should report R^2 , adjusted R^2 , change in R^2 , and the F-change test for incremental variance explained, and



standardized coefficients for predictors in the end model. Regression reporting should adhere to agreed conventions for the model diagnostics and interpretation in terms of association and not causation (Cohen et al., 2003; Tabachnick and Fidell 2019).

Diagnostics and robustness. Assumptions should be checked and reported succinctly: multicollinearity (VIF and tolerance), normality and homoscedasticity of residuals, and influence diagnostics (Cook's distance or leverage) (Field, 2018; Tabachnick & Fidell, 2019). If schools are clustered by tehsil or union council, or if multiple respondents per school remain in the analytic file, inference should use cluster-robust standard errors or multilevel modeling to address non-independence (Cameron & Miller, 2015; Hox et al., 2018). Optional covariates (location, school level, flood exposure frequency, days closed) may be added as a preliminary block or as controls in sensitivity models but should be justified as confounding controls rather than inserted opportunistically (Cohen et al., 2003).

2.8. Ethics

Approval of ethics and consent procedures shall be reported in the manuscript in accordance with the real study implementation. The minimum requirements are that the respondents are required to give informed consent, participation must be voluntary and the school identifiers are to be managed in such a way that re-identification cannot occur during reporting. Data protection procedures (secure storage, limited access) should also be mentioned in the study, and it must be ensured that no personally identifying information is reported in outputs. In the event of using a student add-on, the manuscript must additionally report assent procedures and guardian consent pathways appropriate to the local education governance context (Creswell & Creswell, 2018).

3. Results

3.1. Sample and school profile

The sample data consisted of 80 publicly owned schools in Naseerabad Division in flood prone regions. Schools were predominantly rural (61.3%), with smaller proportions from urban (22.5%) and peri-urban (16.2%) settings. The sample was primarily primary-level schools (51.2%), followed by secondary (23.8%) and middle (18.8%). Most buildings were single-storey (65.0%), which is operationally relevant in flood contexts because single-storey schools tend to have fewer vertical fallback options for temporary space and protected storage. Flood exposure was frequently reported as twice (35.0%) or three or more times (32.5%) over the last three years. Schools reported a median of 7.29 days of closure in the previous flood event (mean = 7; minimum = 0; maximum = 14). The sample profile is summarized in Table 1.

Table 1. Sample and school profile (N = 80)

Variable	Category	n	%
Location	Rural	49	61.3
	Urban	18	22.5
	Peri-urban	13	16.2
School level	Primary	41	51.2
	Middle	15	18.8
	Secondary	19	23.8
	Higher Secondary	5	6.2
Building type	Single-storey	52	65.0
	Multi-storey	12	15.0
	Mixed	16	20.0
Flood exposure (last 3 years)	Once	21	26.2



Twice	28	35.0
3+ times	26	32.5
Missing	5	6.2

Note. Days closed during last flood event: Mean (SD) = 7.29 (3.18); Median [IQR] = 7 [5, 9.25]; Min-Max = 0 to 14.

The sample is structurally weighted toward rural, primary, and single-story schools, which are often the most operationally constrained in flood recovery, providing an appropriate stress-test setting for a school-level resilience model. Scale scoring followed mean index construction as specified in the instrument protocol.

3.2. Scale reliability and internal consistency

All core constructs were scored as mean indices using their respective eight items (SR1–SR8; IC1–IC8; CE1–CE8; PS1–PS8; ER1–ER8), consistent with the instrument scoring plan. Internal consistency was high across all scales (Table 2).

Table 2. Scale reliability (Cronbach’s alpha)

Scale	Items	k	Alpha
Structural Resilience (SR)	SR1–SR8	8	0.955
Institutional Capacity (IC)	IC1–IC8	8	0.971
Community Engagement (CE)	CE1–CE8	8	0.964
Psychosocial Support Capacity (PS)	PS1–PS8	8	0.962
Educational Resilience (ER)	ER1–ER8	8	0.960

The consistently high alpha values indicate strong within-scale coherence, supporting the use of mean indices as summary measures for subsequent correlation and regression analyses, in line with the planned measurement package.

3.3. Descriptive profiles of predictor domains and Educational Resilience

In the entire sample, the mean scores indicated moderate means of reported capacities in domains (Table 3). Community Engagement had the largest overall mean (M = 2.99) and Structural Resilience and Educational Resilience were close to 2.83. The ranges observed suggest that there are high levels of heterogeneity among schools, where the minimum scores are near the bottom of the scale and the maximum scores are near or close to 4.5 to 4.75 on some of the constructs, which means that some schools will have relatively high readiness and some will be low in many areas.

Table 3. Construct descriptives overall and by location: Mean (SD)

Construct	Overall	Rural	Urban	Peri-urban
Structural Resilience (SR)	2.83 (0.64)	2.63 (0.59)	3.33 (0.52)	2.90 (0.65)
Institutional Capacity (IC)	2.87 (0.73)	2.82 (0.74)	2.92 (0.69)	2.98 (0.81)
Community Engagement (CE)	2.99 (0.70)	2.99 (0.68)	2.96 (0.79)	3.06 (0.67)
Psychosocial Support Capacity (PS)	2.84 (0.69)	2.83 (0.71)	2.78 (0.76)	2.93 (0.54)
Educational Resilience (ER)	2.83 (0.69)	2.75 (0.67)	3.03 (0.70)	2.88 (0.72)

3.4. In summary, Table 3 indicates that Urban schools have higher Structural Resilience and marginally higher Educational Resilience than rural schools whereas Community Engagement is comparatively the same across locations. This trend is an indication that the preparedness of facilities can be more geographically imbalanced than community-based practices, although these are descriptive trends, not causal data.

3.5. Bivariate associations among constructs

Pearson correlation revealed that Educational Resilience was positively related to a variety of domains of capacity (Table 4). Structural Resilience ($r = 0.48$) and Institutional Capacity ($r = 0.49$) had the strongest bivariate relationships with Educational Resilience. Community Engagement and Psychosocial Support Capacity were also positively correlated with Educational Resilience with smaller but significant values ($r = 0.28$ and $r = 0.30$, respectively). Structural Resilience was fundamentally disassociated with Psychosocial Support Capacity (r is about 0) suggesting that physical preparedness and psychosocial preparedness may not be co-occurring at the same schools.

Table 4. Correlation matrix (Pearson r)

	SR	IC	CE	PS	ER
SR	1.00	0.38***	0.14	-0.00	0.48***
IC	0.38***	1.00	0.33**	0.22*	0.49***
CE	0.14	0.33**	1.00	0.30**	0.28*
PS	-0.00	0.22*	0.30**	1.00	0.30**
ER	0.48***	0.49***	0.28*	0.30**	1.00

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

The correlation pattern supports the model premise that resilience-related outcomes align most strongly with “hard” readiness (structural) and “procedural” readiness (institutional), while community and psychosocial domains show additional positive alignment but at smaller magnitudes.

3.6. Group differences by location and school level

One-way ANOVA indicated that Educational Resilience did not differ significantly by location (rural, urban, peri-urban), $F(2, 77) = 1.09$, $p = 0.343$, with a small effect size ($\eta^2 = 0.027$). Differences by school level were also not significant, $F(3, 76) = 0.87$, $p = 0.458$, with a small effect size ($\eta^2 = 0.033$). Group means are shown in Table 5.

Table 5a. Educational Resilience by location

Location	n	Mean (SD)
Rural	49	2.75 (0.67)
Urban	18	3.03 (0.70)
Peri-urban	13	2.88 (0.72)

ANOVA: $F(2, 77) = 1.09$, $p = 0.343$, $\eta^2 = 0.027$

Table 5b. Educational Resilience by school level

School level	n	Mean (SD)
Primary	41	2.75 (0.76)
Middle	15	2.88 (0.63)
Secondary	19	2.88 (0.54)
Higher Secondary	5	3.25 (0.81)

ANOVA: $F(3, 76) = 0.87$, $p = 0.458$, $\eta^2 = 0.033$

Though the mean differences are showing slightly higher Educational Resilience in urban and higher secondary schools, the variance within the group is large and the inferential findings show that the differences are not strong in the current sample.



4.6.Hierarchical regression predicting Educational Resilience

The primary hypothesis test used hierarchical multiple regression with predictors entered in the planned block order: Structural Resilience (Step 1), then Institutional Capacity (Step 2), then Community Engagement (Step 3), then Psychosocial Support Capacity (Step 4), consistent with the project’s theory-driven analytic plan. Model fit statistics by step are presented in Table 6a.

Table 6a. Hierarchical regression model fit

Step	Predictors entered	R ²	Adj. R ²	Delta R ²	F-change	p (F-change)
1	SR	0.232	0.222			
2	SR + IC	0.342	0.325	0.111	12.95	0.001
3	SR + IC + CE	0.356	0.331	0.014	1.67	0.200
4	SR + IC + CE + PS	0.397	0.364	0.040	4.99	0.029

In Step 1, Structural Resilience explained 23.2% of variance in Educational Resilience, indicating that facility and resource readiness is meaningfully aligned with continuity and recovery practices. Adding Institutional Capacity in Step 2 increased explained variance by 11.1% (p = 0.001), showing that preparedness governance and coordination contribute additional explanatory power beyond structural readiness. Step 3 added only 1.4% (p = 0.200), suggesting that Community Engagement, while positively correlated with Educational Resilience, does not add a statistically reliable incremental contribution after structural and institutional domains are accounted for. Step 4 increased explained variance by 4.0% (p = 0.029), indicating that Psychosocial Support Capacity explains unique variance in Educational Resilience beyond the preceding blocks.

Final-model coefficients are shown in Table 6b.

Table 6b. Final model coefficients (Step 4)

Predictor	B	SE	t	p	Standardized beta	95% (low)	CI (high)	95% (low)	CI (high)
SR	0.391	0.104	3.748	0.000	0.366	0.183	0.599		
IC	0.262	0.096	2.720	0.008	0.280	0.070	0.454		
CE	0.071	0.097	0.738	0.463	0.072	-0.121	0.264		
PS	0.212	0.095	2.233	0.029	0.213	0.023	0.400		

In the final model, Structural Resilience and Institutional Capacity remain the dominant predictors, with Psychosocial Support Capacity providing an additional, statistically significant contribution. Community Engagement is not statistically different than zero at this point as it would be when the other domains are added, as is typical of a phenomenon where community practices are overlapping with institutional routines, or indirectly as well. Multicollinearity was not great (VIF range: 1.13 to 1.32). There were no issues with residual normality (Shapiro Wilk p = 0.263) and heteroskedasticity (Breusch Pagan p = 0.154). There were no cases of undue influence (maximum Cooks distance = 0.098).

Discussion



3.7. Summary of principal findings

The paper has discussed the educational resilience phenomenon as the ability to continue and recover a school after disruption in case of floods with a hierarchical approach to the theory that is founded on the theory of important school safety and education-in-emergencies structures. These results show a comparable trend: institutional capacity and structural resilience were the most predictive and they jointly accounted the greatest percentage of variance in Educational Resiliency Index. Even though the community engagement was found to have a positive relationship with educational resilience, it could not contribute statistically significant additional variance on top of structural and institutional domains. The psychosocial support capacity added a small but meaningful addition to the previous blocks, which demonstrates that the facilities and procedures do not provide enough explanations of the capacity to reopen. This hierarchical pattern proceeds in favor of a logic of planning that begins with minimum safe-operational conditions and preparedness governance, then the continuity consolidation by increasing the psychosocial preparedness as a practical enabling condition in the case of re-engagement.

The consequences of these results can be applied to the policy making process because in the vast majority of situations climate-related disruption is not something that occurs on a rare occasion anymore. In its global snapshot reports, in 2024 alone, UNICEF estimates that climate hazards have caused at least 242 million students to be disrupted in their schooling, and that the figures are probably even less than the actual disruption due to the flaws in the data (UNICEF, 2025a). The latest sector update and humanitarian reporting in the context of Pakistan still covers the issue of continuity in education as a recurrent operational concern in all the districts that have been impacted by floods, where frequent disruptions and learning conditions are the manifestations of the ever-present learning risks (Education Cluster, 20223; UNICEF Pakistan, 2024). The current research article is effective because it allows one to understand the areas on a school level that seem to be the most consistent with continuity and recovery practice in a flood-prone public school environment.

3.8. Structural resilience as the operational baseline

strong relation between structural resilience and educational resilience is in line with the pillar of the Comprehensive School Safety Framework 202230 on the premise of safe learning facilities, in which safe and usable facilities are the foundation of continuity and risk mitigation (GADRRRES, 2022). Beyond building integrity, structural resilience to flood prone situations derives functional pre-conditions to learning how to restart and proceed: safe classrooms, WASH continuity, secured storage and useable access pathways. Weaknesses of such bases can make continuity strategies weak or ritualistic. Not even the most effective learning recovery schemes can be effective in a situation where the classrooms are not safe, the material is always lost and the facilities are never available in a reliable way during seasonal waterlogging and after the process.



The institutional aspect of hazard exposure which are related to the safety and preparedness of facilities to minimize the degree of disruption and facilitate a safer reopening is also highlighted in the School Safety Framework of Pakistan (NDMA, 2017). The structural effect which is observed is not very surprising therefore; it is a practical fact that which is physical is restricted to what is possible. This has a planning implication: in high-exposure districts, the functional protection and mitigation of risk that is presented by the facilities is not a capital improvement that is not included in the educational strategy. They are included in the continuity infrastructure of schooling.

3.9. Institutional capacity: converting feasibility into reliability

The fact that institutional capacity incremental is a contributor to structural readiness means that facilities are not adequate in the sense that they are required. Preparedness governance, role clarity, drills, coordination routines, information protection and organized reopening procedures are all captured by institutional capacity. The mentioned mechanisms are related to the so-called school disaster management pillar in the Comprehensive School Safety Framework and the operational guidance on school safety preparedness offered by Pakistan (GADRRRES, 2022; NDMA, 2017). The findings indicate that the more the continuity and recovery practices are reported in schools, the more the institutional routines.

The finding is in line with the recent findings in Pakistan that emphasized preparedness and teacher preparedness remained disproportional and needed to be improved on a systematic level. As an example, the study by Iqbal et al., published in 2024, that utilized the Pakistan School Safety Framework as an organizing lens presents gaps in the preparedness of teachers and proposes the framework as a medium of improving the culture of preparedness within schools (Iqbal et al., 2024). Despite the fact that the institutional capacity is quantified in the current study at the school level and not teacher preparedness, the two sets of evidence both result in the same operation finding: continuity is more optimal with routinized and coordinated preparedness as opposed to ad hoc preparedness.

The explanatory value of institutional block also presents another working clue on sequencing to the district planners. The institutional capacity enhancement, in case of the resource scarcity, could provide a relatively fast continuity payoff since it is a partially process-based one and does not entirely rely on long-cycle infrastructure investments. These are the contingency planning, the communication procedures, the records, and the protection of the learning material and the drill based preparedness. The continuity message employed by the Pakistan Education Cluster to react to floods also points out that continuity should be based on the alignment of the sector and specialized aid, and not on rebuilding (Education Cluster, 20222023).

3.10. Community engagement: positive alignment without incremental explanatory power

Community engagement and educational resilience had a positive correlation, and structural and institutional domains had no statistically significant incremental variance. The trend is noteworthy and should not be confused with the fact that community does not matter. There are two interpretations that can be used.

Firstly, the area of community engagement can do it partly through the institutional capacity. Engagement mechanisms are enforced in school leadership practices and system of governance in many-public-school environments. Institutional capacity came in before the community



engagement implies that the statistical space of the community engagement to contribute more variance is limited because some of the contribution of the community engagement is shared by the institutional routines.

Second, in certain situations, engagement may be required but not differentiating. As far as most schools share certain minimum-level communication and assistance locally, the involvement can be linked to school resilience in education, yet it still fails to discriminate superior schools when structural and procedural preparedness are considered. The contemporary literature on the evaluation of community engagement as a preparedness area points out that engagement is a field of procedures, and the measurable impact of its effect often depends on the structure, supervision, and linking engagement to preparedness endeavors (Johnston et al., 2024). This is consistent with the existing findings: when operationalized as continuity surge capacity, e.g. instant local response to processes of cleanup, temporary learning space, follow up attendance to vulnerable learners and household support of learning during closures, community engagement can be most valuable. When indicators of engagement are indicators of overall engagement. but not the continuity-critical mechanisms, incremental explanatory power can be diluted.

The third contextual possibility is that the communities in the affected areas of the floods are themselves weakened on capacity due to the displacement, livelihood shock and cycle of repeated hazards, limiting the degree of community participation which can mitigate the weak structures and weak institutional preparedness. This is consistent with less specific evidence that climate shocks disproportionately affect less wealthy households as well as potentially exacerbate educational vulnerability upon repeated occurrence of these shocks (UNICEF, 2025a).

Nevertheless, the above positive bivariate association is in line with the fact that there is recent synthesis evidence that disaster education and community-based interventions, including those that aid teacher resilience and wellbeing, may be applied in order to promote community resilience when implemented in their whole (Fu & Zhang, 2024). It is the practical reading that proves to be conditional, however, the community engagement cannot substitute the safe facilities and preparedness governance, but it is available to continuity implementation and equity, particularly to re-enrolment, attendance recovery, and provision of vulnerable learners.

3.11. Psychosocial support capacity as an additive continuity enabler

It was noted that psychosocial support increment was significantly higher than structural, institutional and community domains. This observation is justified by the logic of education-in-emergencies because protective and inclusive learning environments are viewed as quality conditions of preparedness, response, and recovery (INEE, 2024). A school will be able to reopen and will not be able to offer meaningful learning when students reenter with the excessively high levels of stress levels, attention deficit and fear and when teachers do not hold an elementary job in order to stabilize the functions and identify signs of distress. The psychosocial block added value aids in the continuity model not being maintained as an access restored, but learning re-stabilized.

New guidelines of operation support this. The technical brief by UNICEF states on how mental health and psychosocial support (MHPSS) can be included in the education program in the event of an emergency, that mental health and psychosocial support (MHPSS) is not an online addition to education programs but rather an addition to education programs, particularly in a crisis, where education programs are disrupted and children are returning to school, traumatized (UNICEF, The strategic position of system needs such as workforce capacity



building, cross-sector coordination, and practical implementation mechanisms that make MHPSS sustainable rather than episodic (UNICEF, 2025b). The psychological first aid principle of the WHO is founded on the concept of support that is humane, practical and culturally respectful and at the practice level it is transformed into the indicators of capacity that were applied in this study which include supportive routines, trusted adults and referral awareness (WHO, 2011).

It is important to note that the psychosocial effect does not imply that the psychosocial support is implemented as a substitute of physical and procedural preparedness. Instead, it implies that psychosocial readiness is a space of its own that may facilitate the explanation of why some schools are better at achieving continuity than others when the probability of reopening is available. Recent qualitative information on the experiences of teachers in the Balochistan province, which was impacted by floods, describes how continuity is based on teacher coping and a lack of resource access and insufficiently developed support structures, and how the role of community and institutional support are pertinent to continuity of education amidst displacement and disruption (Arif et al., 2025). This background evidence inclines on the feasibility of psychosocial capacity as a pragmatic factor in continuity in the area.

Conclusion



4. In this paper, educational resilience has been defined as the persistence and recovery capacity of a school after flood interruption and a stratified predictor model of flood prone publicly operated schools within Naseerabad Division has been tested. The results provide an insight that the structural readiness and the institutional capacity are core to the continuity performance with the psychosocial support capacity adding a significant and incremental value to it after the hard and procedural conditions adjustment has been considered. Practically, it appears that schools are well placed to normalize instruction when (a) they possess secure and functioning facilities and secured necessities, and (b) are able to transform that floor to normal preparedness, coordination and organized restoration.
5. The findings are opportune since the disruption associated with climate is becoming ordinary and not extraordinary. According to the estimate by UNICEF on the global snapshot, there were at least 242 million students in 2024 that were disrupted by climate in schools and the figures are low since there is limited access to certain data. This implication on district planning is that continuity in education needs to be viewed as a sustained ability, which is constructed and sustained, rather than an improvised reaction that is created with each occurrence. This argument follows the Comprehensive School Safety Framework that has safe learning facilities and management of calamities as the two pillars that help in sustaining learning. It is also consistent with the School Safety Framework of Pakistan that considers school safety as a risk assessment, preparedness and response planning framework that is coupled with education governance.

6. Implications

7. The outcomes result in sequenced implication model; and the bigger standards architecture. First, the district measures should reach a minimum safe-operational package (safe facility safety, a functioning WASH continuity, safe storage, safe access) since the continuity cannot be delivered in the cases when the physical environment remains vulnerable. Second, the district should institute a set of operational preparedness (contingency plans, clear roles, drills, communication protocols, record protection, reopening procedures) as such practices can shed more light on continuity capacity than facilities and facilities alone. Third, the element of psychosocial preparedness cannot be viewed as an addition to the planning process: the 2024 technical guidance of UNICEF suggests that mental health and psychosocial support should be part of emergency-related education because recovery in learning is possible only with regard to the facilitating and protective learning environment. Finally, the measurement package that will be relevant in this situation will give a useful monitoring tool to know which schools will require direct foundational support and which will require the layer of intervention, which will make the prioritization decisions more defensible in a case when the budget is limited.

8. Limitations and future research

The interpretation must be provided in a form of a number of restrictions. Firstly, the study is cross-sectional and self-reported capacity measures are used; hence, it can be used to make an associative inference only and not a causal conclusion. Second, survey based indices may fall prey to reporting bias in particular when respondents perceive items differently in different situations or when respondents are under pressure to make their schools appear good. Third, the very high internal consistency values in question support, but do not imply, coherent scale aggregation, but do not imply, validity assertions do need confirmatory measurement endeavors to prove assertions.

Fourth, the analysis is based on school-level constructs, but in case more than one respondent is represented in a particular school, it is necessary to defend aggregation (agreement and intraclass correlation).



Without this, estimates may reflect mixed levels of inference. Fifth, the model explains a substantial portion of variance, but unmeasured factors may remain important, including local governance constraints, budget cycles, teacher turnover, access-route disruption severity, and household displacement patterns. Finally, generalizability should be bound to settings with comparable hazard exposure and public-school constraints, especially given the scale and diversity of climate-related disruption globally.

Future research can help to strengthen this evidence base in three directions. (1) Structural and institutional capacity improvements in flood seasons, practices should be tested to determine whether improvements are predicted to determine faster recovery reopening, higher attendance, and less loss over time as is consistent with the continuity theme of school safety paradigms. (2) Triangulation with administrative indicators of interest, such as closure days recorded and attendance restoration curves, and reopening actions are needed because of the dependence of perception-based measurements. (3) Mechanistic-focused work to disaggregate the nature of efficient community involvement contingent on ethnically focused alignment and limited incremental explanatory power engagement are predicated upon and adhering to engagement as predictors when tracked as continuity-critical functions (attendance follow-up systems, temporary learning logistics, local cleanup mobilization); Finally, feasible integration pathways for school-based psychosocial readiness should be tested in intervention research as advised in the UNICEF Guidelines on integrating psychosocial support into education in emergencies.

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