

Safety and Security of Secondary Schools as Evacuation Center in Libmanan South District

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ABSTRACT

This study evaluates the safety and security profiles of public secondary schools used as temporary evacuation centers during natural disasters in the Libmanan South District of Camarines Sur, Philippines. Utilizing a descriptive-evaluative qualitative and developmental research design, the investigation assesses four purposively selected institutions categorized by enrollment scale: San Isidro National High School (mega), Mambulo Nuevo National High School (big), Eduardo V. Agomaa National High School (medium), and Bagadion High School (small). Standardized evaluative checklists based on the 2010 Department of Education (DepEd) Educational Facilities Manual and the Code of Sanitation of the Philippines (P.D. 856) were administered to a research cohort

of 227 respondents, comprising school administrators, teachers, non-teaching personnel, and municipal disaster risk management experts. The empirical findings reveal that while school sites, campus security, and building safety parameters are evaluated as "Highly Qualified" with means exceeding 3.59, sanitary facilities represent a critical systemic bottleneck, achieving only a basic "Qualified" rating of 3.32. The primary facilitating factors identified include localized community planning, structured early warning systems, and well-defined educational continuity protocols. Conversely, the primary limiting factors are acute funding deficits and post-displacement facility degradation. To address these challenges, the study proposes a developmental safety and security plan designed to enhance structural resilience and protect educational continuity.

Keywords: *School Safety, School Security, Evacuation Center, Libmanan South District, Disaster Risk Reduction, Campus Security, Sanitary Facilities*

INTRODUCTION

A safe and secure school environment is a fundamental prerequisite for achieving educational outcomes and ensuring a learning space conducive to student development. If a government is to fulfill its mandate of providing quality education, it must establish physical spaces where both teachers and learners can operate without threats to their physical safety or mental well-being. Unsafe school environments discourage attendance, increase drop-out rates, and place vulnerable students at heightened academic risk. This relationship is underscored by educational research linking positive school climates with reduced misconduct and improved academic performance. In regions exposed to natural hazards, school safety extends beyond the classroom to encompass disaster preparedness and structural resilience. In the Bicol Region, particularly within the province of Camarines Sur, public school infrastructures are routinely requisitioned during disasters to serve as temporary emergency shelters for displaced populations. This dual-use practice is legally grounded in Republic Act No. 7160 (the Local Government Code of 1991), which mandates local government units (LGUs) to provide immediate relief and emergency shelter to

families affected by natural or human-induced calamities. However, using schools as primary emergency shelters creates tension between the immediate humanitarian need for shelter and the constitutional right to uninterrupted, quality basic education.

The tension between educational continuity and disaster response has prompted national policy debates. The Department of Education has sought to limit the use of classrooms as evacuation centers due to the severe disruption of academic calendars, the degradation of school facilities, and the safety risks posed to students and personnel. Under the "Children's Emergency Relief and Protection Act" (Republic Act No. 10821) and subsequent joint administrative issuances, the use of schools as evacuation centers is restricted to extreme cases where no other viable structures exist and is capped at fifteen days for long-term displacement to prevent interference with classes. To systematically address these challenges, this study evaluates the safety and security of public secondary schools in the Libmanan South District as evacuation centers. The inquiry investigates the structural compliance, resource capacities, operational facilitating dynamics, and systemic bottlenecks of these dual-use facilities. Ultimately, this research provides the empirical baseline necessary to transition localized emergency shelter management from reactive compliance to an operationally resilient and dignified model of disaster governance.

This study is anchored upon a multi-dimensional theoretical framework that synthesizes disaster management, developmental psychology, and organizational design. George Long's Disaster Theory (specifically the "Crunch and Release" model) provides the structural foundation for assessing how vulnerability is generated and mitigated when natural hazards interface with physical structures and social systems. Abraham Maslow's Hierarchy of Needs establishes that physical safety and security represent foundational human requirements that must be met before higher-level cognitive and educational processes can occur. John Dewey's theory of Reflective Education emphasizes how deliberate, structured reflection allows educational administrators and stakeholders to convert raw post-disaster experiences into improved organizational models. Lev Vygotsky's Socio-Cultural Theory highlights how interactive learning and social collaboration, exemplified by disaster drills and community partnerships, cultivate a collective culture of safety. Finally, Joan Woodward's Contingency Management Theory underscores that optimal organizational execution is highly dependent on aligning internal structures and preparedness protocols with the external demands of dynamic crises.

The conceptual framework of this study operates on a systems approach utilizing an Input-Process-Output (IPO) model. The "Input" phase encompasses national and local regulatory mandates, such as the Safe Schools Act, the 2010 DepEd Educational Facilities Manual, and the Code of Sanitation of the Philippines (P.D. 856), alongside the baseline physical profiles of the selected schools. The "Process" phase involves field-based assessment of school sites, grounds, water safety, fire safety, campus security, building security, and sanitary facilities. The "Output" phase results in the development of a comprehensive, standard-based Safety and Security Plan specifically designed to establish safe, secure, and resilient evacuation environments.

To guide empirical investigation, the study formulated a primary hypothesis: the secondary schools within the Libmanan South District are highly qualified to meet the standards required along school sites, campus security, fire safety, and building security, but face significant limitations in water safety and sanitary infrastructure when used as continuous emergency shelters. This hypothesis rests on the assumption that although school facilities meet basic daytime educational standards, their utility as emergency family shelters remains constrained by the lack of permanent municipal sheltering alternatives and dedicated post-disaster recovery funding.

For clarity of analysis, key operational terms are defined as follows: Safety: The condition of being free from physical hazards, environmental contaminants, or structural defects that may cause accidents, injury, or disease. Security: The state of being protected from external intrusions, theft, vandalism, and violence through physical perimeter controls, surveillance, and access protocols. Evacuation Center: A pre-identified, temporary shelter equipped to provide basic survival needs, safety, and dignity to families

displaced by calamities. **School Site:** The physical topography, location, and environmental zoning where the school structures are constructed. **School Playground:** The external ground area dedicated to physical education, student assembly, and recreational activities. **Water Safety:** The provision of adequate, certified potable water supplies for drinking, cooking, and personal hygiene in compliance with national sanitation codes. **Fire Safety:** The set of active and passive structural measures designed to prevent ignition, facilitate rapid egress, and suppress fires. **Campus Security:** The administrative control measures, fencing, and gates used to secure the school perimeter and manage visitors. **Building Safety:** The structural integrity and compliance of constructed educational blocks with national building regulations. **Sanitary Facilities:** The physical toilets, handwashing stations, waste disposal zones, and drainage systems constructed within the school premises.

In evaluating the baseline dynamics of school safety, recent studies have increasingly focused on the necessity of separating day-to-day student policing from broader developmental and risk-reduction concerns. The operationalization of comprehensive disaster risk management in Philippine schools requires a holistic framework that actively integrates local climate change adaptation (CCA) with structural school safety protocols. While educational institutions are primarily designed to foster academic and cognitive progression under a safe socio-emotional climate, their physical vulnerability to natural hazards across the disaster-prone Bicol Region introduces severe operational strains. Recent scholarship points out that the over-reliance on schools as temporary shelters can be attributed to the lack of dedicated, permanent municipal evacuation facilities. This systemic gap highlights a critical policy disconnect school administrators are legally and socially pressured to provide temporary shelter, yet they must do so without dedicated post-disaster restoration funding or pre-retrofitted sanitary infrastructure. Consequently, there is an urgent need to anchor school safety plans upon empirical risk-monitoring tools and multi-criteria decision-making models to evaluate the true carrying capacity of educational spaces.

METHODS

Research Design

This investigation utilized a descriptive-evaluative qualitative and developmental research design. The descriptive-evaluative method was employed to assess the current level of safety and security compliance in secondary schools along seven parameters based on national standards. The developmental research method was applied to design, validate, and propose an actionable, standard-based Safety and Security Plan. This plan was formulated directly from the empirical results to address identified facility deficiencies and operational vulnerabilities.

Research Locale

The study was conducted across the Libmanan South District, located in the province of Camarines Sur. This district is highly exposed to typhoons, volcanic hazards, and seasonal flooding, making its public school's critical assets in the local disaster response network. Four secondary schools were purposively selected to represent different institutional categories based on enrollment size and physical infrastructure: **San Isidro National High School (Mega Category):** Located in Barangay San Isidro, this is the largest secondary institution in the district. **Mambulo Nuevo National High School (Big Category):** Located in Barangay Mambulo Nuevo, this facility possesses a large land area. **Eduardo V. Agomaa National High School (Medium Category):** Located in Barangay Duang Niog, this school was established on a donated one-hectare site. **Bagadion High School (Small Category):** Located in Barangay Bagadion, this institution represents smaller rural schools.

Sampling Technique

A purposive sampling technique was employed to select the participating secondary schools, ensuring the sample spanned different institutional sizes. For the research respondents, a total enumeration

approach was applied to all school personnel, including school administrators, teaching staff, and non-teaching support staff, across the four selected institutions. This approach ensured that all personnel responsible for day-to-day facilities management and disaster response were included.

To provide external validation, a purposive sample of external evaluators was integrated into the research cohort, including the Public Schools District Supervisor, Municipal Disaster Risk Reduction and Management (MDRRM) administrators, and the Sangguniang Bayan Committee Chairman on Disaster Preparedness. The complete distribution of the population and the selected sample is detailed in Table 1.

Table 1. *Research Population and Sampling Distribution*

Institutional Category / Respondent Unit	N	n	%
San Isidro National High School (Mega)	317	137	60.35%
Mambulo Nuevo National High School (Big)	157	68	29.96%
Eduardo V. Agomaa National High School (Medium)	27	12	5.29%
Bagadion High School (Small)	18	8	3.52%
Panel of External DRRM and Policy Experts	5	2	0.88%
TOTAL	524	227	100.00%

RESULTS AND DISCUSSION

School Site Safety Evaluation

The physical and environmental safety of a school site is critical to its suitability as an emergency shelter. The evaluation shows that secondary schools in the Libmanan South District are highly qualified in this area, achieving a grand mean of 4.13.

Table 2. *Standard-Based Evaluation of School Site Safety*

Standard Evaluative Requirements for School Sites	Mean Score	Interpretation
Sufficient freedom from traffic hazards and accessibility to safe transportation.	4.17	Highly Qualified
Located at least 50 meters from cemeteries and memorial parks.	4.18	Highly Qualified
Located at least 200 meters from commercial bars, lounges, and abattoirs.	4.18	Highly Qualified
Located at least 1,000 meters from jails, night clubs, and vice dens.	4.18	Highly Qualified
Accessible to the greatest number of students it intends to serve.	4.16	Highly Qualified
Located away from disturbances and environmental nuisances.	4.15	Highly Qualified
Background noise levels maintained below the standard 70 decibels.	4.15	Highly Qualified
Total site area meets enrolment scale and student co-curricular needs.	4.14	Highly Qualified
Easy access to the local community being served.	4.13	Highly Qualified

School grounds free from unnecessary abrasive materials and rock outcrops.	4.12	Highly Qualified
Topography is well-elevated and easily drained.	4.07	Highly Qualified
Accessible to reliable municipal water supply connections.	3.87	Highly Qualified
Grand Mean	4.13	Highly Qualified

The high mean scores for environmental zoning and spatial buffer compliance (4.18) demonstrate strict adherence to national standards designed to shield schools from hazardous or undesirable community influences. However, the relatively lower score for direct municipal water connections (3.87) signals a critical vulnerability under shelter-use scenarios.

This findings-profile aligns with the post-disaster functional assessment frameworks proposed by Ilumin and Oreta (2018), which emphasize that a school's site configuration must balance its primary educational function with its emergency shelter function. While these schools are physically isolated from everyday community nuisances, their lack of robust, localized water utilities expose them to resource bottlenecks during a high-density, prolonged displacement event. Proper site localization and accessibility are vital for emergency response vehicles, yet the physical site safety is often compromised when regional utility grids fail.

Water Safety Evaluation

The physical and environmental safety of a school site is critical to its suitability as an emergency shelter. The evaluation shows that secondary schools in the Libmanan South District are highly qualified in this area, achieving a grand mean of 4.13.

Table 3. *Standard-Based Evaluation of Water Safety*

Standard Evaluative Requirements for Water Safety	Mean Score	Interpretation
Proper handling, storage, and protection of packaged/bottled drinking water.	4.05	Highly Qualified
Provision of functional drinking facilities with a 1:100 student ratio.	3.80	Highly Qualified
Regular administrative monitoring and cleaning of the water supply system.	3.75	Highly Qualified
Baseline water supply volume (40 liters per capita/day) is maintained.	3.65	Highly Qualified
Water supply is certified adequate and potable by local authorities.	3.58	Highly Qualified
Running water under pressure provided to food preparation and washing areas.	3.50	Highly Qualified
Permanent warning signs ("NOT FOR DRINKING") posted on unsafe taps.	3.47	Highly Qualified
Pipes painted aqua blue and clearly labeled "DRINKING WATER."	3.47	Highly Qualified
Non-potable water strictly barred from galleys and kitchen areas.	3.46	Highly Qualified
Water source holds a valid certificate of potability from a DOH lab.	3.45	Highly Qualified
Water handled, transported, and stored sanitarly if not piped	3.45	Highly Qualified
Grand Mean	3.60	Highly Qualified

Although water management of bottled supplies is rated highly (4.05), the lower scores for potability certification (3.45) and the sanitary transport of un piped water (3.45) highlight the instability of water safety during emergencies. Under prolonged evacuation conditions, the lack of certified potable sources can lead to water-borne disease outbreaks, a critical operational risk documented in municipal camp management assessments across Bicol.

Fire Safety Evaluation

The evaluation of fire safety parameters yielded a grand mean of 3.59, indicating a "Highly Qualified" descriptive status.

Table 4. *Standard-Based Evaluation of Fire Safety*

Standard Evaluative Requirements for Fire Safety	Mean Score	Interpretation
Visual inspections ensure fire extinguishers are in good working condition.	4.15	Highly Qualified
Mops, oily rags, and combustibles stored securely in tight metal containers.	3.80	Highly Qualified
Exterior exit doors and gates configured to swing outward.	3.75	Highly Qualified
Exit paths equipped with functional panic locks and cleared of obstacles.	3.65	Highly Qualified
Structural fire escapes provided on all buildings with 2 or more storeys.	3.58	Highly Qualified
Rubbish, waste, and combustible ashes removed daily.	3.50	Highly Qualified
Fire and earthquake evacuation drills held regularly (at least monthly).	3.47	Highly Qualified
Regular visual monitoring and maintenance of electrical wiring systems.	3.45	Highly Qualified
Stoves, kitchen appliances, and heating devices kept in good repair.	3.47	Highly Qualified
Combustibles subject to strict regulation and fire codes.	3.46	Highly Qualified
Mandatory structural leak-testing of all gas-burning stove connections.	3.44	Highly Qualified
Two exit doors provided per instructional room for safety.	3.40	Highly Qualified
Grand Mean	3.59	Highly Qualified

While active fire protection equipment is highly rated (4.15), the lower scores for electrical system maintenance (3.45) and structural egress pathways (3.40) highlight physical constraints. Older academic buildings often feature narrow corridors or single-door classrooms, which can create safety hazards when these spaces are crowded with evacuees.

As established in building design studies for disaster-resilient educational spaces, outward-opening doors and wide corridors are vital to prevent stampedes and crush hazards when school buildings are subjected to high-density emergency occupancy. This concern is echoed in international reviews of school infrastructure, which suggest that physical and architectural bottlenecks must be minimized to support the dual-use functions of these facilities.

Campus Security Evaluation

Perimeter security and access control are essential for safeguarding both school assets and displaced families. Campus security was rated "Highly Qualified" with a grand mean of 3.66.

Table 5. *Standard-Based Evaluation of Campus Security*

Standard Evaluative Requirements for Campus Security	Mean Score	Interpretation
Sturdy school name signboards displayed prominently at the entrance.	4.20	Highly Qualified
Mandatory registration of visitors in structural logbooks.	4.18	Highly Qualified
Standard student uniforms and ID cards enforced for access control.	4.10	Highly Qualified
Primary entrance gates and service gates are sturdy and functional.	4.10	Highly Qualified
School gates are physically lockable and in good structural repair.	4.10	Highly Qualified
Safe, designated evacuation zones provided within the campus.	3.48	Highly Qualified
Driveways and routes to parking zones are clearly marked.	3.47	Highly Qualified
Security fencing constructed around school boundaries.	3.47	Highly Qualified
Service gates swing outward for emergency egress.	3.46	Highly Qualified
Boundary lines demarcated using temporary vegetative barriers.	3.44	Highly Qualified
Provisions for 24-hour physical guard patrols on campus.	3.58	Highly Qualified
Evacuation zones clearly marked and identified.	3.65	Highly Qualified
Grand Mean	3.66	Highly Qualified

The high scores for visitor logging (4.18) and gate functionality (4.10) indicate robust daytime access control. However, the lower score for permanent security fencing (3.47) and the reliance on vegetative boundaries (3.44) indicate physical gaps that can compromise perimeter control during large-scale emergency response operations.

This findings-profile matches security studies by Ozmen et al. (2010), which argue that weak physical perimeter barriers seriously undermine access control during crises. Security officer performance is strongly linked to clear territorial reinforcement and unobstructed lines of sight. When schools transition to public shelters, the lack of secure physical barriers makes it difficult to maintain access control, which can lead to theft, property damage, and safety risks for vulnerable groups.

Building Security Evaluation

The structural safety and design of educational blocks directly influence their suitability for dual-use emergency sheltering. Building security achieved a grand mean of 3.59, corresponding to a "Highly Qualified" rating.

Table 5. *Standard-Based Evaluation of Campus Security*

Standard Evaluative Requirements for Building Security	Mean Score	Interpretation
Open egress doors maintained during all instructional hours.	4.10	Highly Qualified
Active maintenance of loose floorboards, structural cracks, and windows.	3.69	Highly Qualified
Multi-storey blocks feature handrails and stairways at least 1.8m wide.	3.68	Highly Qualified
Structural steps leading to buildings are slip-resistant and in good repair.	3.55	Highly Qualified
Corridors cleared of physical obstacles and adequately illuminated.	3.48	Highly Qualified

Sturdy, balanced student desks free of protruding nails or splinters.	3.45	Highly Qualified
Security window bars paired with functional fire exit access	3.20	Highly Qualified
Grand Mean	3.59	Highly Qualified

The high scores for stairway design (3.68) and structural maintenance (3.69) suggest sound structural safety. However, the lower score for window bars (3.20) highlights a common design conflict. While iron bars protect classrooms from theft under normal conditions, they can restrict emergency evacuation during fires if they lack quick-release mechanisms.

This reflects a classic security-versus-safety paradox identified in school safety literature: while iron security bars protect classrooms from unauthorized entry under normal conditions, they can block emergency exit routes during a rapid post-disaster evacuation. This challenge highlights the need for integrated structural design reviews that incorporate smart, multi-hazard compliance frameworks to ensure both security and emergency escape capacity.

Sanitary Facilities Evaluation

Sanitary infrastructure represents the most significant operational challenge identified in this study, achieving a grand mean of 3.32, which corresponds to a basic "Qualified" descriptive rating.

Table 5. *Standard-Based Evaluation of Campus Security*

Standard Evaluative Requirements for Sanitary Facilities	Mean Score	Interpretation
Provision of separate, gender-segregated toilets.	4.17	Highly Qualified
Sanitary toilet facilities are easily accessible to users.	4.17	Highly Qualified
Basement toilets avoided to optimize natural light and ventilation.	3.69	Highly Qualified
Toilets structurally provided on all floor levels of multi-storey blocks.	3.55	Highly Qualified
Facilities designed to accommodate persons with disabilities.	3.48	Highly Qualified
Installation of functional lavatories equipped with soap and water.	3.15	Highly Qualified
Provision of paper towels and hand-drying options.	2.80	Highly Qualified
Installation of odor absorbents (sawdust/activated carbon) in restrooms.	2.70	Highly Qualified
Toilets painted or finished in light-colored materials.	2.70	Highly Qualified
Provision of adequate handwashing lavatories adjacent to toilets.	2.67	Highly Qualified
Installation of active mechanical exhaust ventilation systems.	2.64	Highly Qualified
Grand Mean	3.32	Qualified

Sanitary facilities represent a critical operational bottleneck in the district's schools. While basic accessibility and gender segregation are rated highly (4.17), sub-indicators such as handwashing lavatories (2.67) and mechanical exhaust ventilation (2.64) are deficient.

This structural gap can have serious consequences when schools are used for high-density, long-term shelter. During Typhoon Kristine, health reports from the Bato South Central School Evacuation Center in Camarines Sur documented severe sanitary issues, food shortages, and acute risks of infectious disease transmission among displaced families due to overtaxed plumbing and insufficient WASH resources.

Analysis of Facilitating and Limiting Factors

The suitability of public secondary schools in the Libmanan South District as emergency shelters is shaped by distinct facilitating and limiting factors.

Facilitating Factors

The operational efficacy of schools during emergencies is supported by five primary facilitating variables:

1. **Localized Community Planning:** Rather than relying solely on top-down directives, school administrators and local disaster committees collaborate to coordinate resource sharing before crises occur. This integrated approach helps protect school assets and maintain order during sheltering operations.
2. **Structured Early Warning and Contingency Planning:** School disaster coordinators maintain communication with weather and civil defense authorities, enabling them to secure vital educational records and prepare spaces before evacuees arrive.
3. **Systematic Site Selection and Monitoring:** Purposive selection and assessment processes ensure that only structurally sound school buildings are designated as evacuation centers, reducing the risk to sheltered populations.
4. **Camp Management Practices:** By establishing clear behavioral guidelines, visitor registration, and separate zones for shelter and instruction, schools can minimize friction and protect vulnerable groups.
5. **Educational Continuity Protocols:** Standardized protocols allow academic activities to resume quickly after a disaster through alternative learning spaces and flexible school calendars, minimizing learning loss.

Limiting Factors

Despite these facilitating factors, three critical limiting factors restrict the sustainability of the dual-use model:

1. **Structural and Sanitation Strain:** As shown by the low sanitary facility scores, school plumbing and septic systems are vulnerable to failure under continuous, high-density occupancy during multi-family sheltering.
2. **Post-Disaster Funding Deficits:** While disaster response is funded by municipal calamity budgets, schools often struggle to access these funds for post-disaster repairs. Consequently, the cost of fixing damaged classrooms or facilities is often absorbed by the school's limited operating budgets, creating long-term maintenance backlogs and delaying academic recovery.
3. **Regulatory Policy Disconnects:** National policies discourage the prolonged use of schools as evacuation centers, but local emergency managers often lack alternative sheltering structures in rural areas. This leaves school heads with the challenge of balancing humanitarian needs with their primary educational mission, often leading to extended school closures.

CONCLUSION

The evaluation of safety and security parameters in the secondary schools of the Libmanan South District reveals a standard-based compliance profile. Under normal conditions, these schools are highly qualified in parameters such as school site safety, campus security, fire safety, and building security. However, when transition to high-density, multi-family emergency shelters occur, their operational capacity is constrained by sanitary limitations and maintenance backlogs.

The empirical findings highlight a disconnect while schools maintain sound physical structures, their sanitary facilities are vulnerable to rapid failure under continuous usage. This infrastructure gap, combined with post-disaster funding deficits, places a burden on school operating budgets and can lead to class disruptions and learning loss.

To address these vulnerabilities and enhance the resilience of the district's schools, the following strategic policy actions and recommendations are proposed:

1. Sanitary Infrastructure Retrofitting: Prioritize the installation of dual-supply water tanks, high-capacity septic systems, and mechanical exhaust ventilation in designated dual-use school blocks.
2. Dedicated Evacuation Shelters: Advocate for a municipal master plan to build permanent, multi-purpose evacuation centers designed to withstand extreme storms, reducing long-term dependency on educational facilities.
3. Camp Management MOAs: Implement formal Memorandums of Agreement (MOA) between municipal government units and school administrations to establish clear rules, manage utility costs, and protect school property.
4. Post-Disaster Recovery Funding: Establish a rapidly accessible post-disaster recovery fund to cover clean-up and repair costs, preventing the depletion of standard school operating budgets.
5. Curricular and Community Integration: Integrate disaster preparedness and climate adaptation training into both school curriculums and community outreach to build a local culture of safety.

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