A GUIDE TO SCHOOL HAZARD, RISK VULNERABILITY, AND CAPACITY (HRVC) ASSESSMENT

ZONE4SOULTIONS

#DisasterFreeIndia

PREFACE

There is no duty more vital than providing a secure learning environment for our children. Recent instances involving children's fatalities as a result of building collapses, fires, and stampedes highlight the importance of maintaining constant vigilance to protect the safety of students and personnel in schools. The Kumbakonam fire tragedy, which claimed the lives of 93 children; student's death after school building collapse in Tamil Nadu's Thirunelveli district, highlights the importance of having School Disaster Management Plans, scheduling time during the busy school day to practise drills so that school authority, staffs and students can respond efficiently and effectively to unforeseen events, and double-checking plans to ensure that the information is complete and up-to-date.

Zone4Soultions being one of the prominent organizations working in the subject field of disaster management and school safety consider school disaster management planning as one of the key actions for overall school safety. This manual has been designed resources provided during different consultations with our client schools and experts of different states and backgrounds. The manual is designed to help the relevant stakeholders the to identify hazards, risks the school is facing or might face and its capacity to mitigate the impacts of the hazard. It will be necessary that the users of this manual understand the school safety and disaster management concepts and put them in use suitably under their local conditions under the guidance of a qualified Disaster Management Expert. Users are also encouraged to share their feedback and comments on how to improve the manual for the future.

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GLOASSARY

1. Building Code: A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration, and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.
2. Capacity: The combination of all the strengths, attributes, and resources available within a community, society, or organization that can be used to achieve agreed goals. Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacity also may be described as capability. Capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action.
3. Capacity Development: The process by which people, organizations, and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through the improvement of knowledge, skills, systems, and institutions.
4. Disaster: A catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of property, or damage to, or degradation of environment and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.
5. Disaster Risk: The potential disaster losses, in lives, health status, livelihoods, assets, and services, which could occur to a particular community or a society over some specified future time period.
6. Disaster Risk Management: The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies, and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.
7. Disaster Risk Reduction: The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.
8. Emergency services: The set of specialized agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations. Emergency services include agencies such as civil protection authorities, police, fire, ambulance, paramedic and emergency medicine services, Red Cross and Red Crescent societies, and specialized emergency units of electricity, transportation, communications and other related services organizations.

9. Hazard: A dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

10. Mitigation: The lessening or limitation of the adverse impacts of hazards and related disasters. Non-structural Measures: Any measure not involving physical construction that uses knowledge, practice, or agreement to reduce risks and impacts, through policies and laws, public awareness-raising, training, and education.

11. Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. Comment: Resilience means the ability to "resile from" or "spring back from" a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need.

12. Preparedness: The knowledge and capacities developed by governments, professional response and recovery organizations, communities, and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent, or current hazard events or conditions.

13. Prevention: The outright avoidance of adverse impacts of hazards and related disasters.

14. Response: The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety, and meet the basic subsistence needs of the people affected.

15. Risk: The combination of the probability of an event and its negative consequences.

16. Risk Assessment: A methodology to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods, and the environment on which they depend.

17. School Safety: The creation of safe environments for children starting from their homes to their schools and back. This includes safety from large-scale 'natural' hazards of geological/climatic origin, human-made risks, pandemics, violence as well as more frequent and smaller-scale fires, transportation and other related emergencies, and environmental threats that can adversely affect the lives of children

18. Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

19. Vulnerability: The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time.

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1. INTRODUCTION

Schools are considered to be one of the pillars of the education sector. A resilient school can have the lives of school children, staff and teachers and serve as an emergency shelter during disasters. There are many disasters or school-based emergencies like the fire that causes school buildings to collapse or suffer significant damage each year. It results in fatalities among teachers and students, as well as disruptions in their education, preventing them from quickly recovering. Additionally, the improper settings of schools, inadequate preparedness measures, distance from emergency services can turn hazards into catastrophe causing chaos. Though there are many programmes supporting disaster education, but less attention has been given to physical aspects of 'safer schools.'

In this sense, structural and non-structural interventions at school level are required to reduce vulnerabilities by reducing causalities. Structural interventions refer to the application of engineering techniques to achieve hazard-resistance and resilience in structures or systems whereas, non-structural interventions include measures that use knowledge and practice to reduce hazard risks and impacts through awareness and training.

Disasters and School Children

There is substantial evidence that students of all ages can actively learn and participate in school safety measures, as well as collaborate with teachers and other community adults to reduce risk before, during, and after disasters.

The Children's Charter for Disaster Risk Reduction also emphasis on:

- Resilient School,
- Child Protection,
- Children's right to have access to information, and
- Resilient community preparedness

Not only this, but the **Comprehensive School Safety,** seeks to reduce hazard risks on education. Hence the 3 important themes to work on are:

- Safe Learning Facilities: Students, teachers and staff safety
- **School Disaster Management: Culture of school preparedness & safety**
- Risk Reduction and Resilience Education: Educational Continuity

Taking into consideration of unspecific probabilities of occurrence of any hazards, assessing multi-hazard vulnerabilities and capacities of school and school facilities is an urgent task, especially as first responders. Given the purpose of the school, the type of school facilities, geographical locations, effective tools and approaches are required to develop a school disaster management plan signed by a qualified Disaster Management Expert. In this circumstance, the first and most important step is to create an inventory of the school's main structural and non-structural characteristics (e.g., age of construction, number of stories, lateral load resisting system, etc) for disaster management planning and decision making, as well as prioritisation and resource allocation for retrofitting/strengthening plans. Schools may use the hazard, vulnerability and capacity assessment approach to establish customised school disaster management plan in collaboration with community partners to avoid, mitigate, and decrease the possible effect of the hazards.

The continuing process of identifying and prioritising hazards, related vulnerabilities and skills for school facilities to cope with the hazard risks in particular school is known as a **hazard, vulnerability and capacity assessment (HRVA)**. It also entails creating an accountability

structure with measurable actions and a timeline for addressing each risk. Identifying the right assessment tool(s) is a key step in helping school to understand what they are at-risk from and how badly they may be affected as they continue to plan and prepare for significant events that could have severe repercussions. Schools need to employ proper methods to collect the necessary data for the creation and maintenance of school programmes.

This guide, *A Guide to School Hazard, Risk, Vulnerability, and Capacity, (HRVC) Assessment for Schools*, emphasises a critical component of emergency management planning and is designed to help schools in implementing an effective HRVC assessment process, including selecting appropriate assessment tools. This document is not designed to be prescriptive or to provide step-by-step instructions for performing assessments suited for school contexts. Instead, it is intended to provide suggestions for completing an assessment that will quantify school emergency management efforts.

Hazard, Vulnerability and Capacity assessment techniques may differ from one school to another based on factors including location, environment, size, and structure, as well as student demographic and culture. Schools, for example, may be in urban or rural settings, have limited or abundant resources, or serve distinct groups with special requirements. As a result, HRVC assessments must be tailored to each unique school, taking into account all of these considerations.

2. WHAT IS HAZARD RISK, VULNERABILITY, AND CAPACITY ASSESSMENT?

HRVC (Hazard Risk, Vulnerability, and Capacity Assessment) is a vital, scientific procedure that serves as the foundation for all disaster risk management (DRM) planning and programming.

It is used to help concerned authorities in identifying risk in their local settings prior to implementing Disaster Risk Reduction (DRR) plans.

Hazards are known as dangerous events that can result in death, injury, or other health effects, as well as property damage, loss of livelihoods and services, social and economic disturbance, and ecological damage. Considering hazards separately may result in a set of priority actions. It is just as vital to think about the severity of the potential consequences of the hazard as it is to think about the frequency or possibility of a hazard event happening. This will help us in understanding the hazard risk. The susceptibility of a community (or a part of the community i.e., Schools) must be addressed when estimating the severity of a hazard occurrence. **Vulnerability** is a complex interaction of social, economic, environmental, cultural and physical factors around us. Accordingly, vulnerability assessment attempts to identify the potential hazards risks and the underlying factors of vulnerability to hazards and climate change. Understanding the community's vulnerabilities in the face of various types of hazards and risks is only one aspect of the risk equation, accurate identification and appraisal of the **strengths, attributes and resources** that support prompt and robust recovery is also critical.

As conclusion, the probability of hazards and the sensitivity to these hazards make up risk. The qualities or conditions that make people, communities, or assets more vulnerable to dangers are referred to as vulnerability. People who are more prepared are less susceptible. For example, when a region is deforested, it becomes more prone to floods. We may not be able to manage a hazard, the only method to mitigate risk is to focus on vulnerability (by lowering it) and capacity (by raising it). Therefore,

$$\textbf{Disaster Risk} = \int(\textbf{Hazard}, \textbf{Exposure}, \textbf{Vulnerability})$$

The school is a densely populated place and has small children that are one of the most vulnerable groups in the society. Therefore, school safety can be referred as a continuous process to initiate and manage the staff, students and teachers to ensure the safety of all during the emergencies. Thus, HRVC assessment should be a vital part of school emergency management planning. An HRVC assessment will focus on a school's vulnerability to specific threats or hazards, as well as how such vulnerabilities or dangers might be addressed through school's capacities and school disaster management. The HRVC assessment process can be depicted as Figure 1.

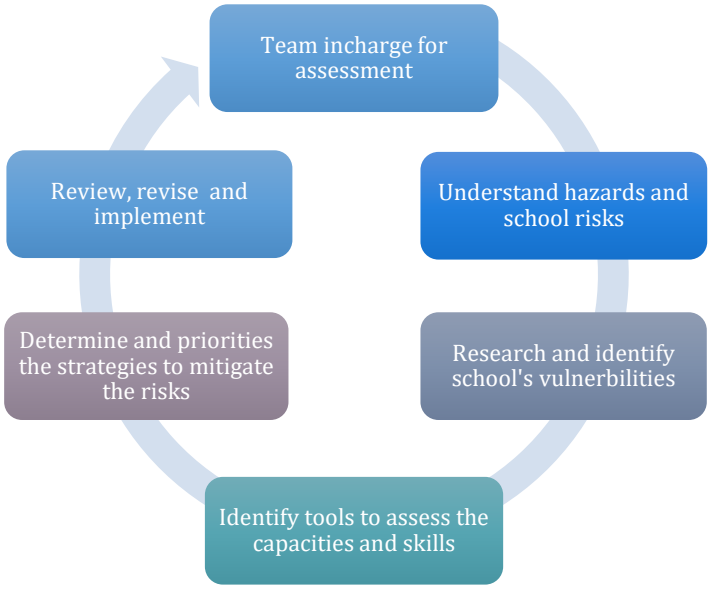

Figure 1: School HRVC Assessment Process

Why Schools Need HRVC Assessments?

According to the Guide to School Disaster Management Plan Manual: A Multi-Hazard Approach, designed by Zone4Soultions, Hazard Identification/ Safety Assessments are an important aspect of school disaster management. Schools must know how to prioritise potential threats before developing school disaster management plan and emergency response strategies. By identifying the vulnerabilities, the school may collaborate with partner organisations to identify structural and non-structural solutions to challenges, as well as strengthen skills and capabilities among students, teachers, first responders, and community partners.

Second, the evaluations may be used to integrate all aspects of disaster management to create personalised plans. It not only assists school administrators in comprehending threats, risks, and weaknesses but also their needs and the actual purpose. In this sense, the following are the key elements of the HRVC assessment to make the assessment stronger:

- Utilize the team assessment approach to understand various perspectives of the assessment process;
- Ensure that the team consider all the hazards that can affect the school premises;
- Understand the needs, resources and capabilities available or required to reduce the impact of the vulnerabilities;
- According to the identified hazard risks and vulnerability, frame the mitigating action;
- Recognize the desired level of capability that will enable the school to meet its Disaster Risk Reduction objectives and become a long-term resilient community;
- Understand what interventions that need to be in place to address the gap between the desired and current capacities; and
- Develop School Disaster Management Plans

Keep in mind, however, that the School Disaster Management Plan is only a tool that is produced as a result of the school disaster risk management processes, and HRVC assessment is the vital step. This will help the school to plan out the mitigation strategies and prioritize them. Once the

strategies are completed, they must be implemented, evaluated and updated regularly, at least once a year.

Whom this Manual is for?

It is design for education authorities, school management staff, teachers and students hoping to provide professional assistance to the concerned stakeholders. It consists of approaches and activities that the school authorities may find useful for their own lives and support their students to get prepared for the disasters. The objective of this manual is making the key stakeholder understand the acceptable 'level of risk' and what to do to prevent the damage of school property and loss of life. This includes:

Hazard Assessment	Determine the frequency and severity of risks in the school' premises and surroundings, which must be incorporated into the school's design.
Vulnerability Assessment	Determine whether the school site's physical attributes exacerbate the risk; To see if design and construction of buildings minimises the danger; To determine which mitigating measures related to building layout and site-wide civil engineering activities will minimise exposure to certain risks. To uncover other non-structural factors that may contribute to a school's resilience.
Capacity Assessment	Gain knowledge on individual capacities, organizational capacities and institutional resources, assets for formulating a capacity development response.

3. HRVC ASSESSMENT TOOLKIT

The HRVC assessment is a participatory exercise and a community empowerment tool rather than just an information collection tool. Through this assessment, the concerned stakeholders come together to discuss and analyse the variety of school safety including resources and capacities, to identify the root causes of their vulnerabilities to hazards and emergencies. In other words, to integrate all the aspects of safety and well-being, diverse groups of children and staff should participate.

KNOW YOUR DANGERS!

Methodology

The research methods used in HRVC assessment aims to understand the school hazard risks and vulnerabilities to hazards as well as promote stakeholder's engagement while encouraging school children, staff and even communities to take collective actions to build school resilience. It also focuses on the capacities (resources like staff, teachers, materials and skills) the school have access to before, during and after an emergency. A comprehensive assessment of physical/material capacity should go beyond a mere inventory of the school's resources, it should be highlighted. Ownership and access to these resources are additional issues that should be addressed. This procedure is more involved than merely filling out a survey questionnaire. There are various methods available to carry out HRVC at various levels including schools. Some are mentioned below:

1. Focus Group Discussions	2. Sharing and Feedback at Formal Meetings
3. Semi-structured Interviews	4. Informal Conversations
5. Iteration	6. Key Informant interviews
7. Participant Observation	

Other than understanding an individual's perspective on hazards, vulnerabilities and capacities by personal interview, it is essential to look at the overall picture by recognizing the often different and changing needs of stakeholders and practitioners. A few of the tools that can be utilized in school HRVC are mentioned below:

Table 1: Tools to be used in School HRVC

Tool	Tool Description
Vision Mapping	An introductory activity session to make school children and staff understand their current situation, the need of HRVC and School disaster management Plan and proposed actions to achieve the goal.
Hazard and Vulnerability Mapping	Identifies the locations where the potential hazard risks lie, the areas, persons, and assets most at risk and vulnerable to the impacts of hazards and school-based emergencies.

Hazard Ranking	Child-centric identification and ranking of all hazards and school-based emergencies from most to least disruptive to their life and education.
Seasonal Calendar	Documents seasonal variation of factors linked to hazards, and school-based emergencies
Resource Mapping	Identifies the school-based resources that can be utilize during emergencies.
Institutional Mapping	Identifies the role of various stakeholders inside and outsides the school and relation between them for preparedness, planning, and response to emergencies.
Transect Walk	Direct observation about the school landscape features, structures, and resources along a given transect walked throughout the school premises.

STEP 1: HRVC ASSESSMENT TEAM/ DISASTER MANAGEMENT COMMITTEE

Disaster risk reduction is the obligation of all stakeholders involved with the school, not only the school's administration. The Disaster Management Committee (DMC) is in charge of managing all areas of disaster risk management at the school. The Disaster Management Committee members collaborate to design and decide on disaster risk reduction actions at the institution. The type and size of the committee will depend on campus size and school population and school level. The committee should preferably be made up of teachers, administrative personnel, parents and students. As the apart of DMC, HRVC assessment team is a crucial aspect of putting together a coherent and complete risk and hazard assessment approach. Team may be used to set assessment goals and objectives, create an assessment timetable, assign roles and responsibilities for next steps, track action item progress, and update and change assessments as appropriate. A team approach gives school decision makers a diversity of viewpoints from people who identify and can effectively analyse the hazards and risks that might affect school.

- Identify individuals who are knowledgeable about different areas of the school, the surrounding.
- Identify individuals who are knowledgeable about different hazards and emergency management.
- Form a HRVC assessment team.
- Establish goals and develop a plan with timeline for tasks and consecutive meetings.

Other than HRVC assessment team, the DMC consist of different other teams such as Warning & Awareness Team, Evacuation Team Search and Rescue Team, etc. The school Principal will have the overall responsibility to lead the disaster management initiatives in the school (Annexure 6)

Who Can Be Included?

Involving a diverse group of people in the assessment process is essential. Teams should be made up of those who can assist detect dangers and may be part in a crisis response if a hazard or catastrophe occurs. Multiple viewpoints based on a wide range of experiences should be provided by vulnerability assessment teams, allowing for better identification of the vast range of hazard risks that might affect a school and its students, staff, and visitors. This might involve:

Table 2: Proposed Members for Different Disaster Management Teams

Administration	School Personals	Community
Principals District representatives	Students Teachers School Administration	Local first responders, youth volunteer; DM expert

	School nurses, clerical staff Paraprofessionals Counsellors Coaches Cafeteria staff Bus drivers	

To guarantee that the process is comprehensive and resulting in system improvement, all team members must be involved in assessment preparation, implementation, and follow up. Assessments should not be done once and then forgotten about. They should be done on a regular basis. Individuals participating in the assessment should collaborate to define intervals and timetables for ensuring that assessments are completed on a school-approved schedule.

STEP 2: ARE YOU READY?

Before, assessing the hazards, vulnerabilities and capacities, it is essential to understand the current scenario of the school disaster management.

A questionnaire including aspects like school disaster management, safe learning facilities and risk reduction and resilience education etc. can be develop to understand all the shortcomings. This will complement the school basic profile. The HRVC assessment starts by compiling the basic information about the school. This will include contact information, the school layout plan, the school compound plan, and map of the surrounding areas of your school (Annexure 1).

STEP 3: CONDUCT HRVC ASSESSMENTS

Understanding the school's risks, risk, vulnerability, and capacity is one of the most critical first steps toward ensuring its safety. This allows for short- and long-term DRR planning based on the institution's resources. For this, the Committee may seek the assistance of a relevant authorised authority or a specialised organisation with the requisite accreditation to perform a hazard risk and vulnerability assessment. During the vulnerability assessment, examine the presence of children with special needs, the distinct vulnerabilities of boys and girls, shelters and evacuation routes, and the likelihood of the school serving as a safe haven or evacuation shelter during crises.

Identify the Hazard

When it comes to potential hazards, there are a few that might affect practically every school, regardless of geography or student population. The following list of risks is not exhaustive, but it is intended to assist schools. The majority of natural hazards are linked to natural processes and events. Anthropogenic risks, often known as human-caused hazards, are caused solely or mostly by human actions and decisions. Disaster risk varies from country to country, area to area, and

even school to school. Each school's HRVC team must identify and outline the school's disaster risks.

Table 3: Types of Hazards

Biological hazards	Physical Environmental hazards	Geological/ Geophysical hazards	Hydro-meteorological hazards	Technological hazards
• Infectious diseases • Contaminated food problems	• Structural hazards • Maintenance hazard • Grounds hazards	• Earthquakes • Landslides • Volcanoes	• Severe wind and heavy precipitation • Cyclone • Floods • Wildfires • Tsunami • Extreme Temperature	• Cyber bullying • Electrical fires • Power outage • Transport accidents

Here are the few ways to identify the hazards the school have experienced or might experience in future:

Hazards Calendar: Learn from the past hazards

It is easier to consider the pattern of hazards, especially natural hazard across the year. This activity can be considered as classroom activity/ group activity involving students for different perspective. To do so explain to students that their objective is to create a year-long calendar based on natural hazards that may occur annually in their region. Months should be grouped on their calendar. Each month should be given a unique name and a description of what occurs throughout that month. Students can make their drawings to represent the hazards. The final outcome can be viewed as figure 2.

Hazards	Months											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Flood												
Heavy Precipitation												
Fire												
Earthquake												
Heatstroke												
Field Fire												

Figure 2: Hazards Calendar

Similarly, manmade hazards such as due to gas leaks, chemical spills etc. from commercial units/Garbage disposing and landfilling sites in close vicinity and that may impact school safety and well-being may be considered in the hazard assessment exercise.

Hazard Hunt Exercise

Another way to understand the hazards and the 'risky' areas in the school premise can be identified using hazard hunt exercise. Hazard Hunting is a programme that identifies hazards by examining the work environment, school, community attentively with the goal of drastically reducing them. This will include the following aspects:

- Discussion on the potential hazards a school can face;
- Non-structural assessment (done practically by Expert team members)
- Structural assessment
- Identification of hazards outside the school campus (Road Safety, Industrial Hazard, Chemical hazard, open drain flooding etc.)
- Database of past disasters/accidents which have affected the schools
- Identification of vulnerable locations within the school campus

After understanding the potential hazards within and outside of a school building, it is important to prioritize the hazard risks. The frequency of hazards can be plotted against their intensity at a place in a matrix. The purpose of creating this matrix is to identify the most critical hazards to be planned for. The multi-hazard building survey will require to understand each identified hazard along with Frequency, Magnitude, Severity, and Risk Priority.

1. Frequency: What are the chances that this type of hazard may occur and have an impact on the school campus? How often does the hazard occur if it does occur?
2. Magnitude: What kind of harm would this hazard do to the school property if it happened?
3. Severity: What impact would this have on the school's essential functions?
4. Risk priority: Determine the likelihood of such a hazard occurring on school campus. Is there a high, medium, or low chance that this threat will happen?

Table 4: Instance: Hazard Assessment Matrix

Type of Hazard	Frequency					Magnitude				Severity					Risk Profile			
	Highly Likely	Probable	Possible	Remote	Unlikely	Catastrophic	Critical	Limited	Negligible	Catastrophic	Critical	Limited	Negligible	Not Applicable	Acceptable risks	Tolerable risks	Undesirable risks	Intolerable risks
Natural																		
Earthquake																		
Floods																		
Extreme Temperature																		
Landslides																		
Cyclone																		
Wildfires																		
Anthropogenic																		
Building Fire																		

Power outage																		
Water system failure																		
Transportation Accidents																		
Medical emergency																		
Bomb threat																		
Civil disorder																		
Weapons Assault																		
Biological																		
COVID-19																		

Note: The Level of Intensity (Colour Code) has been provided as Annexure 2.

This will provide the team to identify the potential hazards and the risk priority. This matrix will also help the team to understand the impact analysis of each hazard as presented in table 5.

Table 5: Instance: Hazard Impact Analysis Matrix

Hazard Vulnerability of Schools							
School	**EQ**	**LANDSLIDE**	**FLOODS**	**AVALANCHE**	**INDUSTRY**	**CONST. TYPE& DENSITY**	**OVERALL VULNERABILITY**
A	VH	M	L	----	M	VH	H
B	H	H	H	M	M	H	VH
C	VH	L	L	----	-----	H	M
D	VH	M	M	-----	M	H	H
E	H	H	H	M	H	H	VH
F	H	M	L	---	M	VH	M
G	M	L	H	----	H	M	H
H	M	M	L	-----	H	M	M
I	L	L	L	-----	H	M	M
J	H	H	H	VH	H	M	VH
K	L	M	L	VH	----	M	H
L	L	M	L	-----	H	M	H

VH	Very High Vulnerability
H	High Vulnerability
M	Moderate
L	Low

After understanding and prioritizing the potential hazard, the next step will be to identify vulnerabilities and put together an action plan to address these issues.

Assessing Vulnerabilities

A hazard cannot do damage without vulnerability, and hence it is critical to assess vulnerability. Vulnerability represents the weakness of the community which can be attributed to its exposure by being located at a certain place to its various demographic, social and economic characteristics that enhance its likelihood to experience damage. Vulnerability assessment can be done again both qualitatively and quantitatively. Various characteristics of vulnerability can again be compared on matrix to identify the risk. For example, to identify vulnerable population of different age group by using following matrix:

Table 6: Instance for Vulnerability Assessment

Age	Income			
	Below Poverty line	Low income	Medium	Very high
0-14				
14-30				
30- 45				
45-60				
60 and above				

Level of vulnerability
- Unacceptable
- High
- Medium
- Low

There are several elements to consider when it comes to safety. Within the school premises, there exist internal vulnerabilities. Internal defects can be either structural or non-structural. External vulnerabilities are those that exist outside of the school's walls but have the potential to harm the school, its teachers, and students.

The school's internal safety encompasses both structural and non-structural aspects. Buildings, constructions, locations, and infrastructures all have structural risks (water supply, power supply, gas supply, water disposal, a system, etc.). The non-structural components of the school are linked to non-structural vulnerabilities (furniture, suspended ceilings, lighting equipment, computers, household appliances, windows, shelves, ventilation equipment, vases, etc.). External vulnerabilities exist outside of the school's walls, yet they nevertheless have the potential to harm the school, its teachers, and its students. Are there any vulnerabilities for pupils on their journey to and from school, for example? There is a risk of traffic accidents if there is no safe road crossing for children. There is a risk of children getting washed away by the water if there is no secure bridge crossing on a river.

Figure 3: Common Non-structural vulnerabilities in school building

Admitting to having flaws may appear to be negative. Every institution has defects. It is riskier to pretend there aren't any problems and then do nothing about it. Schools may find actions to minimise vulnerabilities by recognising vulnerabilities. Thus, the next phase will be to analyse the school's internal and external structural and non-structural vulnerabilities. The vulnerability assessment team should do the following during the assessment process (should be done by DM expert) and while utilising the assessment tools:

- During the Transect Walk, brainstorm with the assessment team what the identified dangers and 'hotspots' on the school premises are. While surveying, keep in mind human, structural (facilities, classrooms, etc.), landscape, technical, cultural, and climatic factors (Annexure 4).
- Research natural disaster occurrences, local crime rates, and other factors;
- Incorporate results and evaluations of any exercises, drills, or actual events;
- Survey regular bus routes for potential hazards;
- Any exercises, drills, or real occurrences should be included in the outcomes and assessments;
- Look for possible risks during after-school activities, such as outdoor activities, after-school activities, and community-wide building access opportunities.
- Students, teachers, families, and members of the community should be assessed on their perceptions of safety, school atmosphere, bullying, gang violence, neighbourhood risks, illicit drug sale or usage, and other topics. While members of the vulnerability assessment team may be competent in a variety of areas, they may not be aware of all the elements that affect assessment inside the school and in the community.
- Establish priorities

Although each school is unique and has its own set of requirements and assessment areas, there are several fundamental components that all schools should examine when performing a vulnerability assessment. These are some of the areas:

- Establishment of an incident command system that ensures critical positions and duties are filled;
- Identification of 'all persons' in the building;
- Safe landscaping: noting locations where attackers may hide or have easier access to essential supplies like phones or power;
- Evacuation routes and planned evacuation places, as well as alternate locations, should be identified;
- Inter-school, intra-school, and home-school emergency notification systems, as well as first-responder compatibility, alarms, and surveillance devices are all available;
- Accessibility and security for hazardous materials storage places.

Compile and provide results of vulnerabilities to all hazards identified after completing the vulnerability assessment. HRVC assessment teams should look for areas where the school might be susceptible and where improvements are needed. One such instance can be:

Table 7: Instance for Vulnerability Assessment

Assessment Area: Hallways	Yes	No	N/A	Issues need to be addressed immediately	Issues need attention soon	Issues that can be addressed in future
Earthquake and fire instructions are located on hallway walls (concerning the disable students).						
Lighting is adequate in all hallways						
No visual barriers block a clear line of sight down the hallways (i.e., pillars).						
Students and staff with special mobility needs are assigned classes on the first floor of a building.						
Stairways are wide enough for two students to pass (going opposite directions) with arms outstretched.						
Railings continue from top to bottom of the staircase on both sides.						
School staff help monitor all hallways before school starts, during periods and immediately after school ends.						

The team should go over each of the checklists as provided in table 7. such as Cafeteria Area, classrooms, bathrooms, communication and warning system, parking lot, playground and athletic field, etc. Vulnerabilities should be detected and checked in the checklist if they exist. The team should consult the map of the school building, compound, and surrounding region before doing so. Any weaknesses or risks should be properly indicated on the map and taken into account when developing evacuation maps and other maps. It is preferred to consult and DM expert of the

vulnerability assessment. The team should also prioritize the actions needed immediately (template: Table 8).

Table 8: Action Plan for Structural Mitigation

Location of structural problem	Description of problem	Action to be taken to remove or reduce problem	Date by which action will be taken	Responsible person
Block 1,2				
Laboratory				
Library				
Computer lab				
Admin office				
Staff Rooms				
Cafeteria				

Resource Mapping and Planning

All available facilities and resources, both inside and outside the school, for emergency aid should be collated and listed. Outside of school, there may be a fire station, hospital, police station, City Commissioner's Office, and so on. Some of the amenities may be relatively close to the school, while others may be quite far away. These facilities should be chosen based on the dangers that the school faces as well as the school's weaknesses. Within the school, there may be an evacuation place and shelter, disaster response equipment and resources, trained people, and awareness materials, among other things.

Emergency Number
1. Disaster Management- 1077
2. District EOC-0261-2663200
3. Police Department- 100
4. Fire Department – 101
5. Ambulance Services- 108
6. Commissioner of Rescue & Relief-1070
7. National Emergency Number-112

Table 9: Facilities Outside the School

Facility	Distance	Contact Person	Contact Details	Comments
Police Station				
Fire Station				
Hospital				
Taxi Stand				
Pharmacy				
DC office				

Not only this, but the HRVC team should assess the disaster awareness level to understand and increase the school's capacity to handle a catastrophic event. This will entail obtaining appropriate equipment and awareness materials, as well as number of times awareness-raising and training exercises have been conducted. However, the HRVC team should check the resource

inventory i.e., the required equipment and tools that the school may require during and after emergency (assessment template: Table 10).

Table 10: Assessment Plan for Equipment and Tools for School Disaster Management

Equipment	Quantity available	Location	Conditions	Quantity required	Person In-charge
Communication					
TV					
Radio					
Mega Phone					
First Aid					
FA kit					
Medicines					
Stretchers					
Resuscitator					
Fire Fighting					
Fire Extinguisher					
Sand buckets					
Water Stores					
Search & Rescue					
Ladder					
Rope					
Torch					
Wheelchair					
Batteries					

Capacity Assessment

The next stage is to determine the school's capacity. Capacity refers to the whole of the school's resources that can contribute to the institution's safety. Existence of a disaster risk management system at the school, applicable DRR knowledge and behavioural reaction among instructors and students, availability of a response mechanism, collaboration with local communities and authorities, infrastructure and material resources, and so on. Capacity may be defined as the ability or opportunity to do something. The following are examples of capacities:

1. **Human resources** include the school's administrative, instructional, and support personnel, as well as students and members of the parental committee.
2. **Behavioural Resources**: Students, teachers, and school personnel are aware of procedures and how to act before (preparation), during (emergency), and after (response) a disaster.
3. **Technical resources** include the school's communication (fixed and mobile phones, radio, Internet, facsimile, etc.) and warning systems (horn, bell, loudspeaker, traditional items that emit loud noise), as well as transportation options.

4. **Cooperative resources:** Cooperation between local community groups, state entities (CoES police, fire services, etc.), non-governmental organisations, private organisations, and others are examples of cooperative resources.
5. **Financial resources**: EI financial resources (budgetary and extra-budgetary) that might be used to carry out DRR initiatives.

Assessment Planning for Awareness Materials

Table 11 shows an action-planning framework to assess and prepare the awareness materials, along with several examples. To prepare disaster preparedness items, plan ahead:

- First, make a list of all awareness items accessible in the school that may be used to provide disaster awareness, as well as their amounts and placements.
- Identify any missing goods or extra quantities that need to be purchased.
- Include who will purchase the things and when they will be purchased.

Table 11: Assessment Plan for Awareness Materials for School Disaster Management

Type of awareness material	Quantity available	Location	Additional quantity needed

Books on disaster education			
IEC material on Disaster Management			
Posters on earthquake and fire safety			
IEC on disability needs			

Assessment Planning for Capacity Building Activities

Table 12 contains an action-planning framework to assess the capacity-building initiatives, along with some examples. To do so, first, we need to make a list of actions that the schools has done to assist raise disaster awareness, as well as when they were executed and who was accountable for them.

Table 12: Assessment Plan for Capacity Building Activities

Activity Needed	Date	Activity Completed	Participation	Person In-charge
Task force training	March 02, 2020	Yes	Students: 120 Teacher: 30 Staff: 10	The administrative Head
Posters				
Leaflets				
Mock drills				

Figure 5: Students during Lifesaving skill training

Note: Reports on post-assessment should be included in the vulnerability were discovered at the school and a walk-through of the premises and an inspection of the populations in school and hazard analysis.

STEP 4: REASSESS AND REVISE

- ✓ Review and update the vulnerability assessment tool on a regular basis, if needed.
- ✓ Re-examine school vulnerabilities on a frequent basis and after substantial changes to the school or neighbourhood.
- ✓ Meet as a vulnerability assessment team/Disaster Management Committee on a regular basis to reassess.
- ✓ Examine the findings of the assessments to help with the emergency preparedness phase's preventative and mitigation strategy.

Evaluate the assessment method and tool as the final step in this cycle assessment process (supporting Annexure 3 and 5), and make any required revisions for future evaluations. Formal reporting establishes a system of accountability, responsibility that raises the chances of success of improvement. Only if an evaluation is a continuous element of the school emergency management planning operations will it be useful. Members of the vulnerability assessment team should decide on a frequency for performing assessments and understand that it is a continuous process. Vulnerability assessments and processes can be incorporated inside administration or school policies and procedures to guarantee that they are conducted on a regular basis. Members of the team should also remember to update the evaluation process on a regular basis (annually, biannually, etc.) and if major changes to the facilities, grounds, or community occur.

As a result of a disaster, all vulnerable areas are affected at the same time - whether it is a school, hospital, or community. It would therefore be wise to use all available resources to prevent widespread devastation. School safety actions can be extended to the surrounding community to raise disaster awareness. As a result, the School HRVC assessment's purpose is to enhance school safety and awareness by analysing present levels of understanding and readiness, identifying needs, and sharing the findings to establish a School Disaster Management Plan. Schools must assess the hazard risk (frequency, impact, and magnitude), identify the risk areas (areas where such hazards occur frequently), identify who and what is at risk, identify the vulnerability factors, and determine whether existing resources (such as equipment and manpower) are adequate in dealing with the major disasters listed above. If resources are insufficient, the necessary contingency measures may be made with School Disaster Management Plan.

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ANNEXURES

Annexure 1: School Profile

State:	
District:	
GPS location:	
School Name:	
School Premises (Area):	
Type of Learning facility:	
Date of Record:	
Contact Details	
Phone No.	Name of Principal/Director:
School Details	
No. of Students	Boys: Girls: Disable: Total:
No. of Staff	Male: Female: Disable: Total:
No. of Teachers	Male: Female: Disable: Total:
No. of Rooms	Classrooms: Laboratory: Store Room: Staff Rooms: Others:

School Buildings Inventory										
Building Name	Construction Type	Roof Type	Number of Floors	Number of Rooms	Normal Occupancy of Building (No. of people using building)	Year of Construction	Conditions			Comments
							Weak	Normal	Strong	

Annexure 2: Hazard Assessment Matrix: Level of Intensity

Frequency	Highly Likely: Occurs repeatedly/event only to be expected Probable: Not surprised. Will occur several times. Possible: Could occur sometime. Remote: Unlikely, though conceivable. Unlikely: So unlikely that probability is close to Zero.
Magnitude	Catastrophic: Cause sudden great damage or suffering. Critical: Have the potential to become disastrous. Limited: Have limited potential to become disastrous. Negligible: Have no or very less potential to affect the school premise.
Severity	Catastrophic: Cause sudden great damage or suffering. Critical: Have the potential to become disastrous. Limited: Have limited potential to become disastrous . Negligible: Have no or very less potential to affect the school premise. Not Applicable: Have no impact on the school system.
Risk Profile	Acceptable risks: Acceptable and have tend to little or no much effect on the regular function of the school. Tolerable risks: Risks will affect the school but can be managed without much loss. Undesirable risks: Serious impacts on the school system. Intolerable risks: Substantial or total breakdown of the school systems.

Annexure 3: Disaster Preparedness Documents Checklist

Description	Ready (Yes/No)	Person In-charge	Comments
School Map			
Building floor plans/schematic maps, to include at least: • Evacuation Routes; • Utilities (Firefighting facilities/Electricity mains/ Water and sanitation facilities); • Safe Shelter Locations (internal and external)			
Basic details of school			
School Disaster Management Committee			
Hazards threatening the school			
Assembly Area Map (with class locations)			
Master List of students			
Master list of faculties			
Problems outside school, Risk Map & Solution			
Basic Emergency and Specific Hazard Procedures			
Organization Chart of the School Building-level Emergency Preparedness and Response Plan			
Emergency Supplies Inventory			
Awareness materials			
Awareness activities and training			

Annexure 4: Transect Walk Analysis

Location	Resource	Person In-charge	Vulnerability	Opportunities	Comments
Water Storage Area	Water Tank, Pipeline	The Administrative Head	Water Leakage, Inadequate water stored, Unhygienic area	Comparatively Bigger Water Tank; Rain water harvesting system; Green Space	
Block 1					
Main Building					
Library					
Power Supply Room					

Annexure 5: Emergency Management Plan Checklist

EMERGENCY MANAGEMENT PLAN CHECKLIST		
Location: _____		Date: _____
	Yes	**Remarks**
1. Have the emergency numbers been confirmed with the concerned departments		
2. Are the emergency contact numbers prominently displayed on the plan		
3. Does the plan clearly specify procedures for reporting emergencies to the government services and the relevant education authority		
4. Are the potential risks within and up to a kilometre from the workplace identified?		
5. Does the plan clearly mention about the evacuation plan?		
6. Are the roles and responsibilities of key personnel clearly defined – task force team leaders, class teachers, office staff and students.		
7. Does the plan give emphasis on the children below class V?		
8. Does the plan address the students with special physical, mental and medical needs?		
9. Does the plan describe about how the staff will be trained and when exercise will be conducted?		
10. Has the plan been endorsed by District Disaster Management Authority?		

Annexure 6: Constitution of Disaster Management Committee