Handbook

EMERGENCY & DISASTER PREPAREDNESS FOR URBAN SCHOOLS

APRIL 2021

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ABBREVIATIONS

ASER	–	Annual Survey of Education Report
AWW	–	Anganwadi Worker
AWC	–	Anganwadi Centre
CBO	–	Community Based Organizations Heat Index
CDKN KA	–	Climate and Development Knowledge Network Knowledge Accelerator
COVID19	–	Corona Virus Disease 2019
DIET	–	District Institute of Education and Training
DRM	–	Disaster Risk Management
EMP	–	Emergency Management Plan
ICDS	–	Integrated Child Development Services Scheme
ICPS	–	Integrated Child Protection Scheme
ICPU	–	Integrated Child Protection Units
IEC	–	Information, Education and Communication
KBP	–	Knowledge Basis Partner
LSE	–	Life Skills Education
MHRD	–	Ministry of Human Resource Development
MWCD	–	Ministry of Women and Child Development
NDMA	–	National Disaster Management Authority
NPDM	–	National Policy on Disaster Management
NDMP	–	National Disaster Management Plan
NSSG	–	National School Safety Guidelines
NGO	–	Non-Government Organization
RTE	–	Right to Education Act
SCERT	–	State Council of Educational Research and Training
SBCC	–	Social Behavior Change Communication
SDG	–	Sustainable Development Goal
SDMC	–	School Disaster Management Committee
SDMP	–	School Disaster Management Plan
SFDRR	–	Sendai Framework for Disaster Risk Reduction
SMC	–	Surat Municipal Corporation
SOP	–	Standard Operating Procedure
UHCRCE	–	Urban Health and Climate Resilience Centre for Excellence

PREFACE

The National Disaster Management Act, 2005, defines a disaster as a catastrophe, mishap, calamity or grave occurrence from natural or man-made causes, which is beyond the coping capacity of the affected community. Disasters occur when natural hazards such as cyclone, bushfire or earthquakes damage human systems. Disasters may be a rare occurrence, but they are often quite destructive events. It may cause enormous loss of life and damage to property, assets and infrastructure in coastal villages.

Past examples of Tsunamis and cyclones in coastal India are, Hudhud (2014), Titli (2018) and Fani (2019) which caused tremendous damages to livelihoods, vegetation and ecology along the coastline of the country especially in northern Andhra Pradesh and southern Odisha. Locust attack in (2020) destroyed crops in farms among Maharashtra, Uttar Pradesh Rajasthan, Gujarat, Madhya Pradesh and Haryana. These disasters contributed to the loss of a substantial amount of crop land and food grains, which reduced the agricultural production of the respective states.

More recently, the COVID19 pandemic outbreak in 2020 has affected all the routine activities and presented an unprecedented challenge to public health and well-being. The closure of schools and colleges during the pandemic has adversely impacted children's education. During this period, education systems around the world underwent a digital transformation from in-person teaching to conducting classes via online platforms.

This experience has led to the realization that there is an urgent need to ensure that children have uninterrupted access to education during disasters or calamities. Given the fact that children are expected to spend majority of their time at school, a safe and secure environment is a prerequisite for effective teaching and learning. Thus, ensuring safety of children, teachers and staff members during disasters is necessary.

'School Safety' has been defined as 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[1].

A safe and secure environment in and around the school is a prerequisite for effective teaching and learning. The Sustainable Development Goals and Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 reflect school safety concerns at the global level. In India, these international pacts acted as a catalyst in adopting the National Disaster Management Plan (NDMP).

The SFDRR has set four priorities:

1: Understanding disaster risk
2: Strengthening disaster risk governance to manage disaster risk
3: Investing in Disaster Risk Reduction for resilience
4: Enhancing disaster preparedness for effective response

Considering the safety of school children and providing them safe environment as high priority area, the National Disaster Management Authority (NDMA) of India, formulated the National School Safety Guidelines in 2016 with a vision for safety of schoolchildren and the same have been shared with the state governments for implementation.

All Schools are directed to prepare their School Disaster Management Plan. The State Governments/UTs are directed to prepare a State specific action plan along with time frame for implementation of the Guidelines and submit the same in stipulated time to the Department of School Education and Literacy, Ministry of Human Resource Development (MHRD) and National Disaster Management Authority (NDMA).

Considering these initiatives, the document is developed as a Handbook to enhance preparedness of the Urban Schools in case of such disasters. It will provide guidance and understanding to the school authorities in urban areas of India to take necessary measures pre, during and post disaster.

Mock Drill at school in Viman Nagar - Source - Air Force School

01 INTRODUCTION

1.1 Project Introduction

Research evidence suggests that climate change influences social and environmental determinants of health – clean air, safe drinking water, healthy food and secure shelter. These are likely to happen more in urban areas and especially for migrants who live in informal settlements with large deficits in provision for risk-reducing infrastructure (including piped water, provision for sanitation, drainage and treatment) and services (including solid waste collection, health care and emergency services).

Children, as part of their education, should also be aware of their immediate environment and resources that the traditional school education system has not stressed upon. Air pollution, heat stress, environmental degradation and climate change are the current issues that children are facing in the urban environments. The air quality, disasters and emergency services in all the major cities in India has drastic impact on the health and educational facilities of the children. Children and adolescents are more vulnerable to climate-related disasters because of their anatomic, cognitive, immunologic, and psychological differences compared to adults.

Taru Leading Edge and the consortium partners have been working on various climate and urban health initiatives for several years since its inception in 1996. Our experience suggests that many issues such as disaster risk management, climate change, water, sustainability, sanitation and hygiene can be mitigated by policy change and technological innovation. Government of India recognises air pollution and heat stress as one of the biggest challenges for Indian cities. In this context, Taru Leading Edge as a Knowledge Basis Partner (KBP) under the Climate and Development Knowledge Network' Knowledge Accelerator (CDKN KA) Program is working with local partners, Urban Health and Climate Resilience Centre for Excellence and Sahamantharan Pvt. Ltd. The program aims at developing knowledge products related to climate change and disasters in Indian cities. This handbook is a part of the initiative and aims to create preparedness for disasters within the Urban Schools.

1.2 Purpose of the handbook

♦ To promote emergency response services in schools

♦ To prepare the school committee for disasters and emergencies
♦ To define roles and responsibilities of the key stakeholders in case of disasters
♦ To create awareness and build the capacity of school committee
♦ To encourage implementation of mitigation activities and guidelines within schools

1.3. Background and context

It is very important to provide safe learning atmosphere for students of our nation. Disasters at schools portray a lot of deaths occurred due to building collapse, fire accidents, earthquake, floods, etc. Due to this, safety of students in school is of high importance. The Kumbakonam[2] fire tragedy in Tamil Nadu which led to the deaths of school-going children, reiterates the need for emergency preparedness at a school level. There are some basic requirements that can reduce the damage due to such disasters if the staff and children know where the fire extinguishers are placed at or which staircase to access in such conditions.

Amongst all the public facilities, children studying in schools are among the most vulnerable groups during any disaster. Many municipal and privately managed schools operate in various urban centers, many of which are built in congested areas and are exposed to various hazards[3]. Inadequacies in the structure and lack of preparedness measures can have disastrous consequences in the event of an earthquake. Interventions, both structural as well as non-structural, to reduce vulnerabilities thus become very important for schools as well as all lifeline structures. The non-structural measures include communicating the risk, creating awareness and building capacities in preparedness and mitigation, school and neighborhood preparedness plans, etc.

This preparedness program essentially targets at promoting a culture of disaster safety in schools. Primary strategies are to help inform, persuade, and integrate the issues of disaster preparedness to develop safe schools. The objective is to sensitize children and the school community on issues of disaster preparedness and safety measures and to motivate the key stakeholders through direct participation in activities that would foster a disaster-resilient community.

1.4 How to read the document

This handbook is created for administrators, teachers, support staff, and other individuals involved in emergency and disaster preparedness for Urban Schools. The chapters of this handbook and the information provided will include the:

Chapter 2:
- Elaborate various types of disasters to guide administrators and staff in assessing risks, planning and carrying out physical protection measures
- Detailed existing schemes, programs, and guidelines for emergency/ disaster preparedness
- Case studies and examples illustrating successful activities that have already been undertaken at the school/institutional level.

Chapter 3:
- Identify key stakeholders and vulnerable population
- Detail preparedness action plan to support and guide the schools. It consists of pre-disaster, during-disaster, and post disaster steps to be undertaken by the School Management Committees

Chapter 4: Actions to involve and include special vulnerable groups of children (not enrolled in the schools)

Chapter 5: Self-assessment checklist for the schools

School teacher in Philippines giving disaster training in case of earthquakes - Source - Rappler

02 ROLE OF URBAN SCHOOLS AND NEED FOR DISASTER PREPAREDNESS

2.1 Disasters impacting Urban Schools

What is a Disaster?

As defined by the National Institute of Disaster Management (NIDM), a **disaster** is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope with using its own resources.

What are the types of disasters?

When **disasters** affect cities or **urban** areas, they are referred to as **urban disasters**. These disasters are broadly divided into two categories – natural and manmade. The quality and capacity of city governments, educational institutions and schools is highly relevant to the distribution of local risk levels, those associated with everyday life as well as less frequent, more extreme events.

Natural Disasters: A natural disaster is a major adverse event resulting from natural processes of the earth, for example, the floods, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. A natural disaster can cause loss of life or property damage, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover[4]. While the natural disasters such as earthquakes occur in the shorter periods of time and impact the small areas, other natural disasters such as droughts develop over the longer periods of time and impact the large areas. Furthermore, some disasters follow a geographic distribution like earthquakes and volcanic eruptions that often occur along the tectonic plates on the land or the ocean floor.

Manmade Disasters: Man-made disasters have an element of human intent, negligence, or error involving a failure of a man-made system, as opposed to natural disasters resulting from natural hazards. Such man-made disasters are crime, arson, civil disorder, terrorism, war, biological/chemical threat, cyber-attacks, etc[5].

2.2 Effects of disasters on the Urban Schools in India

Urban Floods/ Flash Floods: Floods not only close schools but they destroy infrastructure, make roads inaccessible for students and teachers, displace families and increase disease outbreak. Families may have lost all their assets and be unable to send their children to school due to lack of food, clothing, etc. Schools and their contents may be damaged or destroyed, making them perma¬nently or temporarily unavailable for learning activities. Schools may be used as shelters for people who have been displaced from their homes due to the natural disaster.

Cyclones: Educational institutions suffer an extensive structural damage during a cyclone. In case of residential schools, then children suffer a lot as they must live shelter-less until the damaged structure is repaired.

Water logging: To reach up to the school becomes a challenge in such a condition. Many times, the school is waterlogged or surrounded by undrained water, which generate many water-borne diseases like dengue, malaria, chikungunya, etc. In case, the infected children do not get proper and timely medical treatment, then the disease can increase the child mortality.

Lightening:, Generally, lightening occurs in open areas, like garden, sports fields, playgrounds, etc., which are the obvious areas in school premises, where the students perform many activities such as sports, recess, marching band, and other outdoor extracurricular activities. The activity with the fastest rising lightening casualty rate is outdoor sports and recreation, which includes school activities. Thus, it is important for coaches, referees, and leaders of other outside school activities to practice good lightning safety. Support from school management is essential in facilitating this process. Therefore, schools need an effective integrated lightning safety plan.

Heat stress/ Heat illness: It is observed that schoolchildren spend a significant portion of their time attending school, which includes indoor as well as outdoor activities. Thus, the temperature of the place has an impact on the students' health. Extreme heat can cause heat stroke, heat exhaustion, heat cramps, and heat rash.

Pandemic (Covid-19): The COVID-19 pandemic has affected educational systems worldwide leading to total closures of schools, universities, and colleges. This was to reduce the spread of COVID-19. School closures have impacted not only students but also teachers and their families. Many school/colleges staff lost their jobs, which had an inverse effect on the economic growth of country.

Fire accidents: During the short-circuit fire or any fire caused by human negligence, the situation may convert into big trouble. In case the fire is near the school building, then the school building may seriously be compromised or even destroyed in the process. Damage to the school building may result in it becoming uninhabitable for an extended period of time, meaning that the school will have to find alternative locations to hold classes or temporarily transfer students to other schools until the fire damage has been repaired.

Riots: Riots can have really bad effect on the students as well as on the working staff in school. Post riots, the school staff may have to go through police enquiry. Infrastructure and facilities in schools like the seating desks are damaged during riots.

Construction collapse: This is very risky in case of schools, as children spend majority of daytime in school, thus a collapse in structure may lead to serious injury and in certain cases, death of students and school staff. Repairing work for the school structure may take an extended period of time, thus a temporary place should be arranged to conduct school.

Terrorism: Schools are often seen as very soft and vulnerable targets for terrorists. The impact of a terrorist attack can be much greater on school as compared with other places. It affects the mental health of students. It may also cause exacerbated fear, anxiety, depressed mood and stress, which leads to lack of interest in studies.

2.3 Existing schemes, programs, and guidelines for emergency/ disaster preparedness:

'School Safety' has been defined as the creation of safe environments for children starting from their homes to their schools and back. This includes safety from the 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[6].

India has developed the national policy instruments that focus on school safety:

National Disaster Management Act (NDM), 2005[7]: The National Disaster Management Act 2005 lays down the institutional, legal, financial and coordination mechanisms for Disaster Management (DM) at the national, state, district and local levels. Through the National Institute of Disaster Management (NIDM), the Act envisages the promotion of safety awareness among the stakeholders including teachers and students.

National Policy on Disaster Management (NPDM), 2009[8]: The National Policy on Disaster Management 2009 highlights the need for structural as well as non-structural safety in schools and educational institutions. In the chapter on Techno-legal Regime, the policy identifies the school buildings as a national priority and enables the provision for designing the school buildings/hostels with earthquake-resilient features and equips them with appropriate fire-safety measures. In the chapter on Capacity Development, the policy also emphasizes upon the disaster management training in all the educational institutions including the schools. A section of the policy refers to the role of National Cadet Corps (NCC) and the Scouts and Guides in schools and colleges for disaster management related work. It also discusses the introduction of the subject of disaster management in the curriculum through the Central and State Boards of Secondary Education.

National School Safety Policy, 2016[9]: The National School Safety Policy Guidelines was published in early 2016 by the National Disaster Management Authority of India (NDMA). It envisions an India where all children and their teachers, and other stakeholders in the school community are safe from any kind of risks due to natural hazards by making the schools risk-resilient ensuring that all school children across the country remain safe from any kind of disaster risk as they access their right to education.

Fundamental principles that form the core approach of these guidelines are given below:
- All hazard approaches
- Strengthening existing policy provisions to make schools safer
- School safety as an indicator of quality for planning, execution and monitoring

Action areas of the guidelines are:
- Strengthening institutional commitment to safe learning environment for children
- Planning for safety
- Implementation of safety actions
- Capacity building for safe schools
- Regular monitoring of risk and revision of plan

It also outlines the roles and responsibilities of different stakeholders for the overall well-being of children and teachers as well as their families. The various stakeholders involved are State Disaster Management Authorities (SDMAs), District Disaster Management Authorities (DDMAs), National level Education Authorities, State level Education Authorities, District and Block level Education Authorities, State Council of Educational Research and Training (SCERT)and District Institute of Education and Training (DIET),school administration, Accreditation and Registration Authorities for schools, PRIs / Urban Local Bodies and Line departments, School Children, Non-Governmental Organizations (local, regional and international), Corporate bodies, International Funding Agencies and United Nations, Media.

2.4 Key stakeholders and vulnerable population:

Several key parties play major roles in the disaster management process, like school management, local governments; national governments, regional institutions; NGOs, Municipal Corporations, Media and scientific communities. Some of them have been discussed below:

Management Committee	Management committee is responsible for disaster management provision in any school. In case of any emergency caused due to disaster, they are responsible for students' safety. They should have an idea of escape plan during disaster.
Communities	Communities are the most vulnerable stakeholders in disaster management. The vulnerable communities need to be aware of hazards and negative impacts to which they are exposed and be able to take specific actions to minimize the threat of loss or damage. For example, while the coastal communities need to be educated and prepared for the possibility of a tsunami, a community in Himalayas can be educated to respond to an early warning system for landslides and earthquakes.
Local Governments:	The local governments should have knowledge of the hazards that communities may face during or post disaster. Local governments must be actively involved in the design and maintenance of early warning systems. It should also have capacity to instruct or engage the local population in a manner that increases their safety and reduces the potential loss of resources on which the community depends.
National Governments:	The National Government is responsible for policies and frameworks that facilitate early warning, supports state government and ULBs financially, if required.
Regional institutions and organizations:	NGOs and media come under this category.

2.5 Case studies:

TYPE OF DISASTER	LOCATION	NAME OF SCHOOL	PREVENTIVE MEASURES TAKEN
Earthquake	Delhi	Ludlow Castle School (now known as Pratibha Rajakiya Vikas Vidyalaya)[1011]	• It is a government school which takes care of 1700 students. Due to its proximity to the Divisional Commissioner's office complex, the school will serve as an emergency shelter and relief distribution point in the event of an earthquake or other disaster. • School is divided into two buildings 1) the classroom block and 2) the multi-purpose room and a free-standing auditorium. • The process involves reinforcing the buildings' brick walls with "seismic belts" of steel mesh and concrete that will make them more resistant to damage and bracing or anchoring objects that could fall on the students. • The classroom block is a three-storied unreinforced brick masonry building with reinforced concrete floors which gives the structural stability during earthquake and resists the structural damage.
Tsunami	Yarada	Zila Parishad High School	• The hazard-specific response plan was prepared, which included only the core exercise for every disaster. Responsibility during disaster period was distributed among the School Disaster Management sub-teams. • Each sub-team consists of a staff member/teacher and 4-5 students for assistance. The different sub-teams were classified as per their respective duties such as: Awareness generation, warning and information dissemination, evacuation, search and rescue, fire safety, first aid, and conveyance team. • Structural and nonstructural vulnerability was assessed for the school. This highlighted the various structural cracks in the building, showing the weak structural strength and parts of the school that might get damaged during the disaster. Also, the open electrical wiring in the corridor posed threats like short circuit. However, the non-availability of fire extinguishers and sand buckets indicated the lack of preparedness for fire hazard. • After receiving the tsunami warning from the local disaster management authority, all the teams, as mentioned above, must be activated and a warning signal must be issued. • On hearing the alarm, the pupils must evacuate the classroom in an orderly manner. • Special arrangement must be made for people with disability. • On staircases, everybody should be disciplined and must come outside calm and quietly. • At the assembly point, a roll count must be taken and if anybody is found missing, it should be immediately reported to the School Disaster Management Committee (SDMC) or the search and rescue team. • The transport management team must take students to the safer place away from tsunami area. • Usage of electric appliances such as computer, mobiles, landlines, etc., must be avoided because lightening can cause power surges in appliances which might cause severe electric shock when used.
Cyclone	Yarada	Zila Parishad High School	• After receiving the cyclone early warning from the local disaster management authority, all the teams must be activated, and the warning signal must be issued. • On hearing the alarm, pupils must evacuate the classroom in an orderly manner. • Usage of electrical appliances such as computer, mobiles, landlines, etc., must be avoided because lightening can cause power surges in appliances causing severe electric shock when used. • Special arrangement must be made for people with disability. • On staircases, everybody should be disciplined and must come outside calm and quietly. • At the assembly point, a roll count must be taken and if anybody is found missing, it should be immediately reported to the SDMC or the search and rescue team. • The transport management team must take students to the safer place away from the cyclone area.
Earthquake	Yarada	Zila Parishad High School	• An evacuation map was prepared by the school in the event of an earthquake. • At the first indication of ground shaking, all the teams must be activated, and the warning signal must be issued in the school. • People in the classroom should perform DROP, COVER and HOLD • After the shaking stops, all the classrooms must be evacuated and students/staff must be moved to the area designated in the evacuation map. • Special arrangement must be made for people with disability. • On staircases, everybody should be disciplined and must come outside calm and quietly. • At the assembly point, a roll count must be taken and if anybody is found missing it should be immediately reported to the SDMC or the search and rescue team.
Fire Hazard	Yarada	Zila Parishad High School	• Immediately after the fire is discovered, the alarm must be triggered, and all the teams must be activated. • Local fire brigade authority must be informed immediately • On hearing the alarm, all the pupils must leave the classrooms in an orderly manner. • If anybody catches fire, he/she must perform STOP, DROP and ROLL-on floor until fire on clothes extinguishes. • Special arrangement must be made for people with disability. • On staircases, everybody should be disciplined and must come outside calm and quietly. • At the assembly point, a roll count must be taken and if anybody is found missing, it should be immediately reported to the SDMC or the search and rescue team.

TYPE OF DISASTER	LOCATION	NAME OF SCHOOL	PREVENTIVE MEASURES TAKEN
Floods	Yarada	Zila Parishad High School	• After receiving the flood early warning from the local disaster management authority, all the teams must be activated, and warning signal must be issued. • On hearing the alarm, pupils must evacuate the classroom in an orderly manner. • Special arrangement must be made for people with disability. • On staircases, everybody should be disciplined and must come outside calm and quietly. • In case of sudden flooding, evacuate the affected areas and shift the people on the upper floors of the building and wait for the emergency rescue services to come.
Epidemic	Yarada	Zila Parishad High School	• Students should be advised to remain at home and consult a doctor in case any symptom is found. • Teachers should be alert about any epidemic spread and they should make students aware about the symptoms and its remedial measures. • The students found to be suffering from any symptom must be separated from other children in the classroom. • There should be a provision for regular medical checkup of all school students, teachers and other staff. • Alternate arrangement for continuation of school education • After any hazard, it is vitally important to continue the routine classes of students. Schools must have a contingency plan for providing education irrespective of hazard impact.

TYPE OF DISASTER	STATE	GUIDELINES
Earthquake		• Construction of earthquake resistant school buildings. • Retrofitting in already constructed buildings.
Flood	Himachal Pradesh[12]	• Selection of site for the construction of school building shall be done with the level of flooding water in mind. • Open space for emergency construction of sheds, etc., shall be left to the extent possible.
Fire		Fire extinguishers to be placed in the schools and the teachers to be identified and trained for using the same in case of a fire in school or in the neighbourhood
Flood	Odisha[13]	• Construction, maintenance and protection of flood control structures like embankments, ring bunds, etc. • School buildings in flood-prone areas should be constructed on an elevated area and if necessary, on stilts and platform. • Construction of tube wells on raised platforms and seed bank on higher ground. • Structural mitigation measures include construction, maintenance and protection of flood control structures such as embankments, ring bunds, dams and levees. • Non-structural mitigation measures include well-maintained boats available at all time at the Gram Panchayat level and awareness on the flood-proof habitat planning with a long-term goal of floodplain zoning and rehabilitating all to the safer zones.
Earthquake		School buildings must have earthquake resilient features. Building bye laws applicable for the specific earthquake zone of therein should be followed.
Fire		• Establishment of fire stations as per Fire Safety Byelaws. • Promotion of usage of fuel blocks during summers to minimize cases of fire during summer. • Awareness campaign on fire hazard and strategies to prevent fire incidents.
Earthquake	Uttar Pradesh[14]	• In 2006-07 the Elementary Education Department proposed to integrate earthquake resilient design into all new school buildings to be constructed under Sarva Shiksha Abhiyan. • This involved building 6850 school buildings and 82000 additional classroom buildings with earthquake resistant measures. • To prepare for this, one design of primary school buildings, two upper primary and three additional classroom designs were prepared with detailed construction manuals which were made available to the District Magistrates and Basic Shiksha Adhikaris (Education department officials at the district level) of all 70 districts included in the project.

INTERNATIONAL CASE STUDIES:		
Earthquakes, floods and landslides	Nepal (Bhaktapur, Syangja & Chitwan)	Good example of making community aware about disaster is observed in Nepal. The Nepali Red Crescent Society has worked in more than 450 communities' prone area to earthquakes, floods and landslides. School students are involved in hazard mapping and vulnerability and capacity assessments in their communities. Using peer learning sessions, competitions and Junior RC Circles, students have raised funds for awareness and mitigation work.
Jaipur	Philippines, Banaba	A regional NGO, the Centre for Disaster Preparedness, and a local environmental coalition Buklod Tao, established in the development of Child Oriented Participatory Risk Assessment and Planning Tools. Children and parents are engaged in participatory hazards, vulnerability and capacity assessment. A resulting action plan led to mothers producing life vests for children, and flood evacuation drills with children using life vests in local swimming pool were initiated. Disaster preparedness education messages are conveyed through banners in each of the seven neighbourhoods.

Disaster Management Drill in DPS, Delhi - Source - DelhiPublicSchool

03 PREPAREDNESS ACTIONS FOR SCHOOLS

It is possible to anticipate certain natural disasters, give schools and educational institutions adequate time to evacuate or take other safety precautions. But then again, there are hazards such as fire or chemical leakage that can occur abruptly and quickly place a school at risk. To encourage and sustain school-wide protection and minimize the consequences of accidents and damages, administrators, instructors, workers, parents and students should work together. For this, the first step the schools should take is to determine the risks of natural hazards in their vicinity and prepare themselves for any unseen and worse conditions. The action plan below will help schools assess their risk of being impacted by natural disasters and some of the man-made disasters such earthquake, heavy rainfall leading to urban foods and or landslides, fire hazard, Chemical leakage, Heat stress/ Heat wave, Cold Wave, Cyclone/ Tsunami/ Storm surge, etc.

3.1 Preparedness Actions by the Schools

A disaster risk management (DRM) protocol is the total of all activities and measures which are taken up before, during and after an extreme event with the purpose to avoid damages, reduce its impact or recover from the losses. Thus, DRM has three stages and their respective activities:

a. **Pre-disaster** – this stage includes activities related to prevention, mitigation and preparedness for any envisaged risk;

b. **During Disaster** – during this stage it is important to focus on coordination, communication to minimize suffering and damages;

c. **Post Disaster** – includes response, recovery and reconstruction activities;

Further, disasters are broadly categorized into two; **natural disasters – those that are induced by occurrence of natural phenomenon** such as earthquakes, cyclones, floods etc. and **man-made disasters – those that results from human intent, error, or as a result of failed system,** such as fire, chemical leakage, etc. A terrorist attack is also considered as a man-made disaster. However, since it is a specialized subject and requires sensitive dealing, this has been kept aside from the purview of this handbook.

The **objective of this chapter** is to detail out each stage of the DRM and provide the step-by-step guidelines that an urban school may follow to avoid, reduce and mitigate the adverse impacts arising from any extreme event and or disaster.

3.2 Pre-Disaster Stage – Prevention, Mitigation and Preparedness

Disaster prevention and mitigation refers to those short- and long- term activities that are undertaken to avoid, reduce and mitigate the adverse effects of a disaster. In general, there are three key elements that are common across all the disaster management plans and they are:
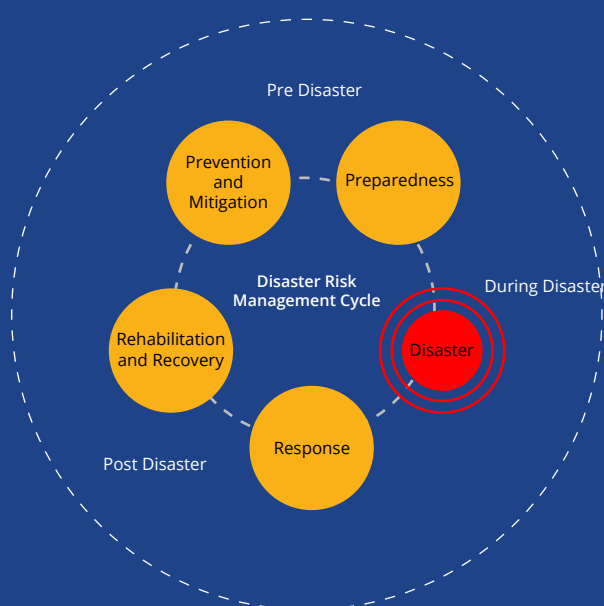

Figure 1: Preparedness Actions by The Schools
(Source – Taru Leading Edge)

a. Ensuring a **Safe Surrounding** by building and maintaining **Safe Infrastructure**;

b. Preparing an **All-Inclusive Disaster Management Plan** and implementing the same;

c. Enhancing **Collective Community Resilience** through awareness building;

Figure 2 refers to the three pillars approach to the Comprehensive School Safety being introduced by Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector.

To ensure the safe surroundings, safe infrastructure and raising a collective community resilience while ensuring safety of children, teachers, staffs and others, it is important to formulate an action plan, or in other words Disaster Management Plan that is well informed of the surrounding risks.
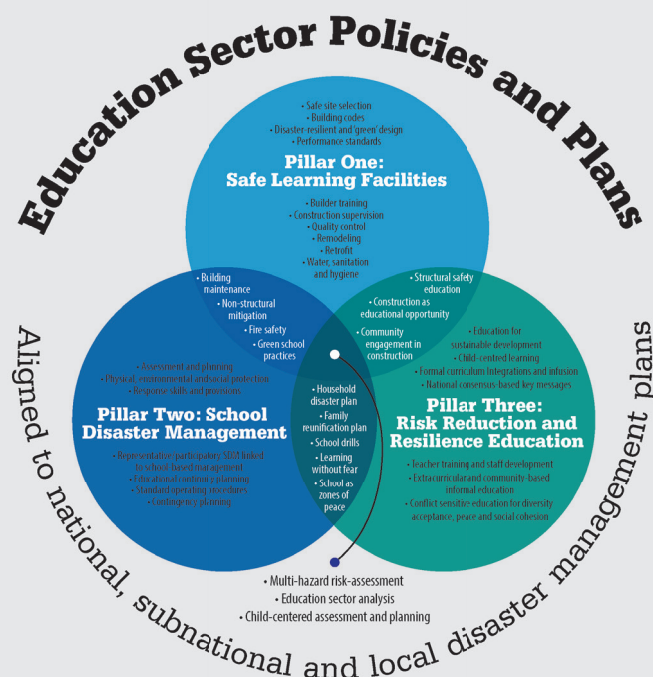
Figure 2 - Three Pillars Approach to Comprehensive School Safety by GADRRRES

There are five key steps that a school needs to follow for preparation and the implementation of School Disaster Management Plan. Nonetheless, for any plan to succeed and be sustainable, it requires human commitment and financial support. Thus, as Step Zero (0), a school should form a School Disaster Management Committee, which will be responsible for preparing the action plan and where necessary arrange for financial support to implement safety measures. Figure 3 below illustrates the "Five Steps to a Safe School and Neighborhood"[15]

Figure 3: Five-Steps to a Safe School and Neighborhood
(Source – Taru Leading Edge)

3.1.2 Step 0 – Formation of School Disaster Management Committee and Sensitization

A School Disaster Management Committee (SDMC) essentially coordinates and carries out all activities pertinent to DRM and remains active throughout the cycle. It is the responsibility of the committee along with the school's management to ensure that their school is a safe place for education and prepare school for any kind of eventualities that in general can lead to disaster.

The committee needs to be all-inclusive to capture discrete requirements of different stakeholder groups such as the students including both boys and girls, children with special needs, teachers, staffs and visitors. The committee should also include parents (at least one female), city-ward representative, a local physician, a local NGO dealing with children, and representatives from local fire-station, police station and health department, such that during the disaster necessary support and protection can be received immediately.

Roles and Responsibilities of the Committee:

The main role of the committee is to identify the risks, implement preventive measures and coordinate with other support systems such as early-warning system, fire-fighting groups, health departments, etc. The key responsibilities of the committee are state below:

1. Create sub-groups and define their roles and responsibilities for coordination and a collective effort:
   - Early Warning and Information Dissemination Team
   - Fire Safety Team
   - Emergency Evacuation Team
   - Search and Rescue Team
   - First Aid Team
   - Site Security Team
   - School Bus/ Van/ others Safety Team
   - Team for Students with Special Need
   - Awareness Generation and Resilience Building Team

2. Prepare and implement School Emergency Management Plan;

3. Mobilize funds for carrying out preparedness and mitigation measures;

4. Convene mock drills and evaluate plan's effectiveness;

5. Maintain liaison with the local administration regarding local Disaster Management Planning;

6. Train the teachers and students;

7. Raise awareness among the communities in the neighborhood;

An indicative list of roles and responsibilities for various stakeholders has been outlined in Annex 1.

Table 2: Sample of a Hazard Calendar *(Source – Taru Leading Edge)*

Hazard Calendar	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cold Wave	←→											●
Heat Wave					←→							
Flooding							←→					
Cyclone/ Tsunami								←→				
Storm surges								←→				
Landslides	Not prevalent											
Fire	←											→
Earthquake	←											→

3.1.3 Step 1 – Assess Exposure to Risks

The first step to prepare for any risk is to know your risk. Thus, the SDMC along with the help of sub-groups should first identify various hazards that their school may face and gauge the level of exposure. Example:

- We are highly likely to face earthquakes as our school is in earthquake prone zone (Zone V) and there have been frequent events in the past; *Exposure Level - High*

- We may face earthquake in future as in the past 20 years there has been an occurrence of high magnitude; *Exposure Level – Medium*

- We are in Zone II of country's earthquake zonation, and there has been no history of event in last 100 years; *Exposure Level - Low*

The best way to assess exposure to various hazards is to refer to the local level/ district level disaster management plan(s). Frequently occurring hazards can also be identified based on archives of historical events and or referring to elderly people in the neighborhood. A period of 20-25 years can be considered.

The school may prepare a Hazard Calendar as given below - indicating when and what kind of risk the school may be exposed to:

Once the hazards such as earthquake, cyclone, flood, fire, etc., are identified, the mapping of vulnerable areas within the school campus and the exposure level should be assessed.

Vulnerability mapping exercise essentially involves demarcating the areas within the school campus and its immediate surroundings as per its safe or unsafe feature. For instance, a classroom for toddlers and the sick-room are highly vulnerable as children in these areas are expected to require maximum evacuation and rescue support than the others. Similarly, from the structural point of view, the main electrical panels, DG sets, canteen with fire provision, laboratories are highly susceptible to fire hazard. Thus, demarcating these areas as per its feature and occupancy can help identify the exposure levels.

The entire exercise can be carried out by the students under the guidance of teachers within the school premises and of the neighboring areas. However, it is advised that seeking an expert opinion is always beneficial. Further answering the Questionnaire provided in Annex 1, can help in detailing each hazard, assess the level of exposure and identify the minimum mitigation measures that should be taken to avoid and minimize risks, such as, ensuring structural safety of the school buildings, having the fire-fighting equipment, having an early warning system and evacuation plan in place, etc. As an outcome of this step, a school will be able to identify the hazards it is exposed to due to its geographical location, identify the vulnerable areas within the school campus due to its structural features and occupancy, as well as establish an understanding of possible mitigation measures that should be applied to either avoid or reduce the risks.

Thus, the next step would be to close the gaps by implementing necessary mitigation measures and draw an Emergency Response Plan.

3.1.4 Step 2 - Plan for Risk Reduction and Enhance Safety

Based on the assessment from Step 1, the next step is to plan for risk reduction and enhance safety of the school premise. For the new schools, select the safe school sites and implement the disaster-resilient design and incorporate the access and safety for people with disabilities. Ensure that children's access to schools is free from physical risks, such as pedestrian paths, road crossings, etc. Implement climate-smart interventions such as rainwater harvesting, solar panels, school gardens and other such features.

For existing structures, minimize non-structural and infrastructural risks in the building and facilities, including design, interior layout and furnishings for safe survival and evacuation.

After ensuring structural and non-structural safety, plan for the time of emergency and prepare an Emergency Management Plan (EMP). An EMP consists of:

- A detailed-out school profile from the disaster risk point of view and the contact details of emergency services,

- A Building Evacuation Plan with detailed roles and responsibilities of each sub-groups/ stakeholders,

- An Inventory of Resources including Emergency Kits for children, detailed out Emergency Warning System; and

- A detailed-out Dissemination Plan. A format for preparing a School Emergency Management Plan has been provided in the Annexure – Annex 2.

Building Evacuation Plan:

The building evacuation plan should consist of the following:

- An Evacuation Route Map showing the safe places (with accommodation strength) within the school where the children and staff members can take shelter during emergency situations;
- With arrows on the map show all stairs, doors, windows and exits clearly demarcating the pathways to safe places;
- Post the map at various points in the school (classroom/ boards) marking the current location on the map as "YOU ARE HERE" in bold red letters and arrows indicating the nearest exits and pathway to nearest safe place.
- Each map of the given location (say floor/ specialized area) should contain at least one

contact detail from the Fire Safety Team, Emergency Evacuation Team, Search and Rescue Team, First Aid Team and Team for Students with Special Need, etc.

- The maps should also delineate the first step that an occupier of the place should take at time of emergency.
- Inventory of Resources
- The following resources available in the school need to be listed:
  - o Stretcher
  - o Fire extinguishers
  - o Ladders
  - o Thick ropes
  - o Torches and batteries
  - o Communication system
  - o First aid box
  - o Temporary shelters (tents and tarpaulins)
  - o Drinking-water bottles
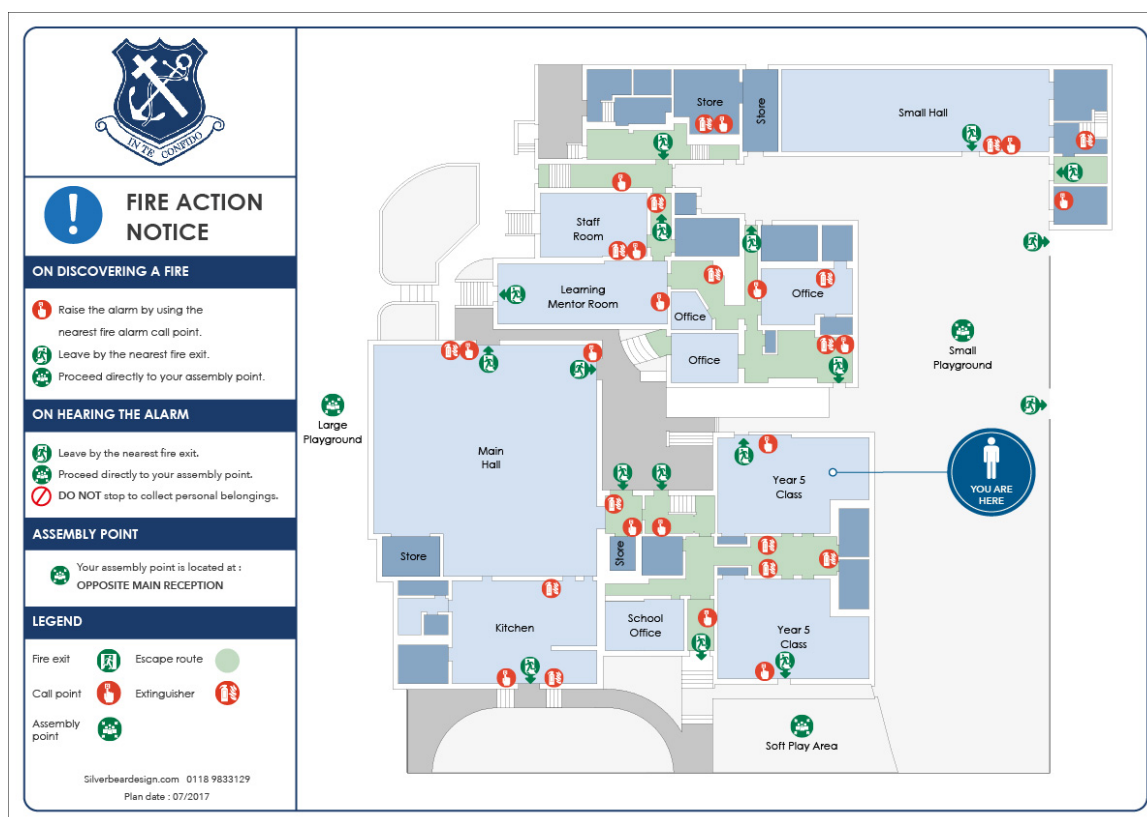
Figure 4: Building Evacuation Plan *(Source – Silver Bear Design)*

Emergency/ Early Warning System

Schools should be equipped with Emergency/ Early Warning System through local communication systems such as Television, Radio, Mobile and Land-phones. Television and radio are a good medium to follow weather alerts, while mobile and land-phones are the medium to communicate to local authorities and vice versa at the time of emergency. While it is not

necessary for schools to have internal wired/ wireless communication system, comprising of micro-phone and speakers, however, nowadays it is common in metropolitan schools to have such wireless communication system across all parts of the school. These kinds of systems are good for communicating during a sudden occurrence of emergency such as during a fire breakout, chemical leakage, earthquake, terror attack, etc., and demanding a quick action.

Figure 5: An illustration of installation of GPS system in School Buses
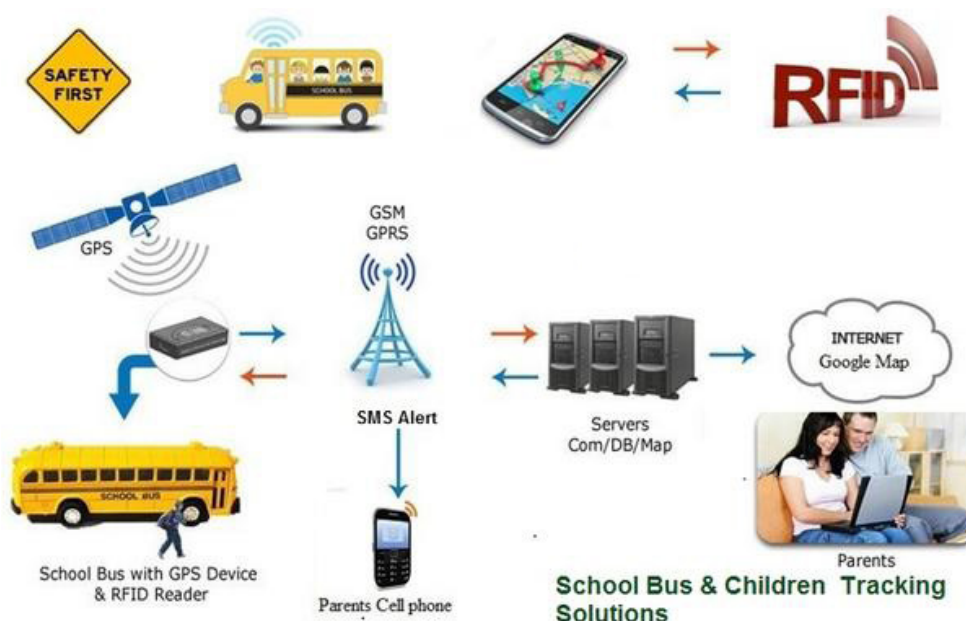*(Source – Ingenios Smart Technologies)*

CCTV cameras and security guards are also helpful resources to manage the movement of children at time of emergency. Following are the list of equipment that a school must have as a part of its Emergency Warning System and should be managed and coordinated by the School Disaster Management Committee (SDMC):

- Smoke/ fire detectors in classrooms, canteen, staff-rooms, offices, and every possible corner signifying fire hazard;
- CCTV cameras installed at places to detect commotion/ intruders;
- A radio/ television running local news and announcement;
- A mobile phone that can receive alerts from the local authorities;
- GPS system in school buses;
- SMS alert system connecting teachers, parents and local authorities;
- Microphone-Speaker Announcement System;
- Signage's directing emergency evacuation routes.

Similarly, the school buses should also have GPS system to be able to locate and communicate on time.

3.1.5 Step 3 - Implement the Plan

In this step, it is important to prioritize the actions and perform the mock drills for all type of emergencies. Safe Structure, Safe School

◊ First and foremost, all issues related to structural safety, such as damaged/ weak doors and windows, cracked ceiling/ wall/ floors, loose electrical wires, etc., should be rectified and secure a safe infrastructure.

◊ All non-structural risk, such as obstacle in any pathway, including design as well as interior layout and furnishings should be secured to be safe for survival and evacuation.

◊ Check for design changes required for access and safety of students/ people with disabilities.

◊ Ensure that children's access to schools is free from any physical risks (pedestrian paths, roads, etc.)

◊ Water and sanitation facilities also need to be checked against any potential risks. For instance, water supply line should be secured from getting contaminated during flooding.

◊ Where possible implement climate-smart interventions such as rainwater harvesting, solar panels, etc.

◊ Simultaneously, establish early/ emergency warning system and communication system, such that, during an emergency condition, local authorities can be contacted in no time.

Mock-drills

The effectiveness of disaster response plans and the state of readiness can be tested through mock drills. Frequent drills are a key to achieving proper response by occupants, especially toddlers during an emergency. Mock drills help to enhance coordination among Emergency Support Functions, generate awareness among stakeholders and provide enabling conditions to identify the gaps in resources, manpower, communications and others. A well-trained staff and students will guarantee that the crucial steps necessary for everyone's safety are taken as quickly as possible.

Conducting drills should be organized by School Disaster Management Committee (SDMC) and coordinated among the Early Warning and Information Dissemination Team, Emergency Evacuation Team, Search and Rescue Team, First Aid Team, Site Security Team, and Team for Students with Special Needs. SDMC shall be responsible for preparing and executing the mock exercise to ensure that all aspects of this SOP are adhered to in the letter & spirit. Drills should include, assigning the staff and high school students/ students with responsibilities of communicating alerts and coordinating evacuation. Class teachers should be assigned to observe student reactions of their respective class and later provide feedback on performance for improvement.

Drills need to be school specific, depending on the location of the school. For example, schools located in coastal areas should master drills for storm surges and tsunamis while those inland and along rivers should master drills on floods. It is advisable to provide prior notice when a drill is conducted for the first time. This will emphasize the importance of emergency, natural disaster and the need to practice emergency drills. Once the staff and students are trained, drills can be performed on a regular basis without giving any warning.

Drills

- *Earthquake*
    - o Practice drop, cover, and hold
    - o Evacuate classroom in less than 1 minute without pushing or falling.
    - o Evacuate school in less than 4 minutes using different exits.
    - o Look out for friends.
    - o Stay away from weak areas.
    - o Help those who need assistance.
    - o Escort young children or elders.

- *Fire/ Chemical Accident Drills*
    - o Write what to do clearly in the Laboratories and Kitchen area in the school
    - o Practice mock drills every month
    - o Quiz the children every week on what they would do if:
        1. The chemical in the test tube caught fire
        2. The gas was leaking and someone lit a match.
        3. The acid splashed on the floor.
        4. Glass broke
        5. Someone drank nitric acid by mistake

- *Cyclone Drill*
    - o Listen to cyclone warning and recognize changes in weather
    - o Make announcements in each class about the care they need to take and where to go
    - o Provide food, water, sheets, and beds in the place where different people will assemble.
    - o Explain how to remain safe outdoors.
    - o Shift money and other valuables.
    - o Put off electricity.
    - o Remove or close down gas connections
    - o Keep safe kerosene, petrol, diesel chemicals etc.

3.1.6 Step 4 - Monitor and Evaluate Effectiveness

The school emergency management plan needs to be periodically evaluated and updated. The best way to test the effectiveness of the plan is to conduct various mock drills. Remember different hazards require different mock drills. For instance, in the event of an earthquake, the first step is to practice drop, cover, and hold, whereas for an event of fire, the first step is to evacuate to a safe place.

The suggested period for updating the plan is quarterly and it is the responsibility of the School Disaster Management Committee (SDMC). Steps for conducting different mock drills have been delineated in Annex 3. However, these steps are indicative only and an expert's help should be sought for conducting the one or two mock drills. To illustrate, the local fire-fighting station can be called in for assistance during the mock drills for fire, chemical hazards, and earthquake.

After the drill, each student, teachers, staff, any other occupier should be consulted for feedback and ideas for improvement. Emergency warning systems and emergency resources should be checked for their effectiveness and ease of managing the same. Each of the sub-groups should discuss the experience and check for any system/ coordination failure.

3.1.7 Step 5 - Share, Reach-out and Advocate

Awareness and education actions

The Disaster Awareness Group should formulate an annual plan for awareness generation, conducting mock drills and train the trainers. An ideal composition of a Disaster Awareness Group has been detailed out in Annex 1, under Roles and Responsibilities.

The members of this group should be creative and should understand sensitivities around cultural and gender difference. The team can make use of available Information, Education and Communication (IEC) materials available at the public domain, such as posters, pamphlets, films, etc. on disaster management. A school can also prepare their own materials involving children, such as –

- Art Work: Posters, bulletin boards, exhibitions, wallpaper, cards, bookmarks etc.
- Creative writing competitions – Essays, Poetry, Slogans
- Drama – Street plays, "nukkad nataks', Role playing.
- Song writing
- Debates

As a first step towards awareness building, the teachers should undergo a thorough orientation on different aspects of Disaster Risk Management, such that they can teach their respective classes. Develop strategies to scale-up teacher involvement for an effective integration of these topics into the formal curriculum as well as non-formal and extra-curricular approaches with the local communities.

3.1 During disaster

This phase is also called the Response Phase. During disaster, the primary aim of the school authority should be to ensure that children, teachers and staffs are out of danger. Schools must focus their attention on addressing immediate threats to children and get them to safe places and minimize their suffering.

In case of fire and or any other disaster that is limited within the school premises, the local authorities must be informed immediately. The school authorities, SDMC and the respective sub-groups should maintain a calm and composed demeanor, such that the children don't get traumatized and no chaos is created. Evacuation should be carried out in smooth and swift manner. Parents should be informed in a responsible manner and seek their help to clear the campus as quickly as possible.

Guidelines on the roles and responsibilities of different teams during the response period have been detailed out separately under Annex – 1.

3.2 Post disaster

The social disruption that results from natural disasters often interrupts children's schooling. A UNICEF study indicated that around 37 million children have their education disrupted each year because of environmental threats. Children and young people may be unable to learn due to fear or trauma. Assessments have shown that children show signs similar to post-traumatic stress disorder, affecting academic performance. Thus, the main priority for both schools, local authorities should be to get children back to school as soon as possible and return some sort of normalcy to their lives. Getting the children back to school and ensuring a return to normalcy has been found to be vital for their psychological settlement after disasters. It also gives their parents the space and time needed to grieve, build new shelters, recover their possessions and find employment.

Authorities and parents should support the school in provisioning temporary learning spaces in a protective and safe environment if the school structure has been damaged. School and parents should ensure they receive vital services like vaccinations, medicines, child protection referrals, hygiene messaging, and, access to clean water and food during school hours.

Counselling should also be extended to parents on normal and abnormal patterns of psychological response expected from children and to the most vulnerable and marginalized groups - girls, children with disabilities, and religious minorities.

Once the situation comes under control, damages should be assessed from the point of view of what could have been avoided and thus what can be improved to prevent disaster. The principle of Build Back Better should also be viewed as "a window of opportunity to adopt to the changes for better" - including, for example, rebuilding climate compatible buildings, provisioning designs and facilities for specially abled children, child friendly remodelling of infrastructure such as the building, stairs, furniture for marginalized communities and adopting best practices in terms of school curriculum.

Fire safety training in school - Source - Development discourse

04 DO'S AND DON'TS FOR SPECIAL GROUPS AND INTEGRATING THEM WITH SCHOOL LEVEL RESILIENCE

5.1 Inclusion and need

Mainstream approaches to disaster resilience often view all children as a homogeneous group and the scope is often limited to school-going children. An equity-focused approach is needed to guide the disaster resilience solutions precisely to those children who are the hardest to reach. School-level disaster resilience is the capacity of schools to recover or maintain their function and thrive in the aftermath of a shock or a stress, regardless of its impact, frequency or magnitude. It is not a new concept and has been debated and discussed over the past decades across the scientific disciplines including the urban planning.

When it comes to building resilience against disasters, the concept also internalizes the concerns of vulnerabilities and includes the children from the neighborhood where the school belongs. Such groups are prone to be more vulnerable where resilience can be imagined in a more holistic approach, "beyond the walls of school buildings". This chapter provides a context of an increase in disaster risk factors which have an impact on special group children. Its purpose is to provide guidance for governments and schools regarding the inclusion of vulnerable children.

5.2 Special vulnerable groups: who are they?

As per the scope, the group of such vulnerable children includes out-of-school children, children with special needs, children associated with streets, Anganwadis and children involved in the labor work or associated with NGOs/CBOs.

Out-of-school children

Dropout is a universal phenomenon of the education system in India. Girls in India tend to have higher dropout rates than boys. In urban areas, children belonging to urban slums are more likely to drop out of school. India, as a nation, has struggled with high rates of school dropouts and low learning levels. The Annual Status of Education Report (ASER) has also been raising red flags regarding the literacy levels of our school-going children for the past decade or more. According to the Ministry of Human Resource Development (MHRD), as of 2015, 62.1 million children are out of school in India. The 2011 Census estimated the figure at 84 million—nearly 20% of the age group covered under the Right to Education

(RTE) Act. At this stage, traditional gender norms push girls into helping with household chores and sibling care, leading to irregular attendance that eventually results in dropouts. Early marriage, lack of safety in schools and low aspirations related to girls' education also lead to their dropping out, (Taneja, 2018). The recent Annual Survey of Education Report (ASER) 2017 findings suggest that while on an average the difference between enrolment levels of boys and girls at the age 14 are declining by 18, the state doesn't enforce compulsory education through the RTE Act, 32% girls are not enrolled—compared to 28% boys. Bridging mechanisms for out-of-school children exist at the elementary stage but are absent for secondary education.

Children with special needs

Children with special needs are those having physical challenges, developmental disabilities like mental retardation, and sensory challenges like blindness or deafness. They are rightly known as "differently abled". India has 7.86 million differently-abled children in the age group of 0–19 years. Despite the presence of laws and regulations for providing and endorsing safe mobility of the differently abled, Indian cities have dearth of universal accessibility leading to exclusion of differently-abled children and their families from basic human rights and amenities. Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act 1995, Sections 44, 45 and 46 categorically provide for non-discrimination in participation, non-discrimination of the roads and built–up environment. As per Section 46 of the Persons with Disabilities Act, states are required to provide for ramps in public buildings, toilets for wheelchair users, Braille symbols and auditory signals in elevators or lifts, and ramps in hospitals, primary health centres and other rehabilitation centres.

Children and adolescents associated with Anganwadis

In India, the Integrated Child Development Services Scheme (ICDS) is the flagship state run programme with a mandate to deliver services for children below six years of age, pregnant and lactating women and adolescent girls. The services offered are health, nutrition, immunization, and non-formal early education. These services are offered through an Anganwadi (courtyard shelter) Centre, by a field

worker called the Anganwadi worker. This is perhaps one of the largest state-run networks offering services for early childhood care and development. Typically, a centre is available per 1000 population, thus making it not only the largest free service provider, but also the most accessible one. Each AWC consists of six basic components for services: Supplementary nutrition, non-formal pre-school education, immunization, health check-up, referral services and nutrition and parent's health education.

After the introduction of the National Early Childhood Care and Education Policy, it has been made mandatory to offer structured pre-school education to children aged 3-6 years in the Anganwadi Centre itself. This has also brought into focus the importance of preparing the child for formal schooling and paying attention to the school readiness skills required for future achievement in formal schooling.

For girls who are out of school, Anganwadis are the places for nutrition, growth monitoring and health education through various schemes like Kishori Shakti Yojana. However, the lack of accurate information, inadequate guidance, parent's limited capacities, lack of life skills and insufficient services from health care delivery system are some of the major barriers in holistic development of out-of-school adolescent girls associated with Anganwadis.

Children involved in labour, victims of exploitation or associated with NGOs or CBOs

At an age where children should be in school and learning, many children are married off; engaged in work– in farms, households, restaurants, and in industries; trafficked for labour and sexual exploitation; and exposed to abuse and violence. According to the Ministry of Women and Child Development (MWCD), around 170 million or 40 percent of all children in India are either vulnerable to or are experiencing difficult circumstances, such as violence at home, separation from family and living a street life. Protecting children from all forms of violence, abuse, and exploitation in different settings, including family, community and wider society is essential to ensure that they are given all the rights due to them. Many state/local NGOs or CBOs are involved in protecting the rights of such children. The formal exclusive schemes and programmes like Integrated Child Protection Scheme – ICPS, Integrated Programme for Street Children are also in place.

5.3 General guidelines for schools to integrate especially vulnerable children in collaboration with other stakeholders

General Dos and Don'ts have been categorized as per following 4E's Conceptual framework in order to integrate vulnerable children to school level resilience.

Engineering

This category talks about measures related to infrastructure, equipment, operations, technology, etc

Education

This category explains the capacity building measures for school authorities, teachers, Anganwadi Workers, NGOs. Capacity is in terms of knowledge, skills or attitudes

Enforcement

This category talks about employing rules and regulations, implementation of legislations

Engagement

This speaks about engaging adolescents themselves as representative of citizens in resilience measures
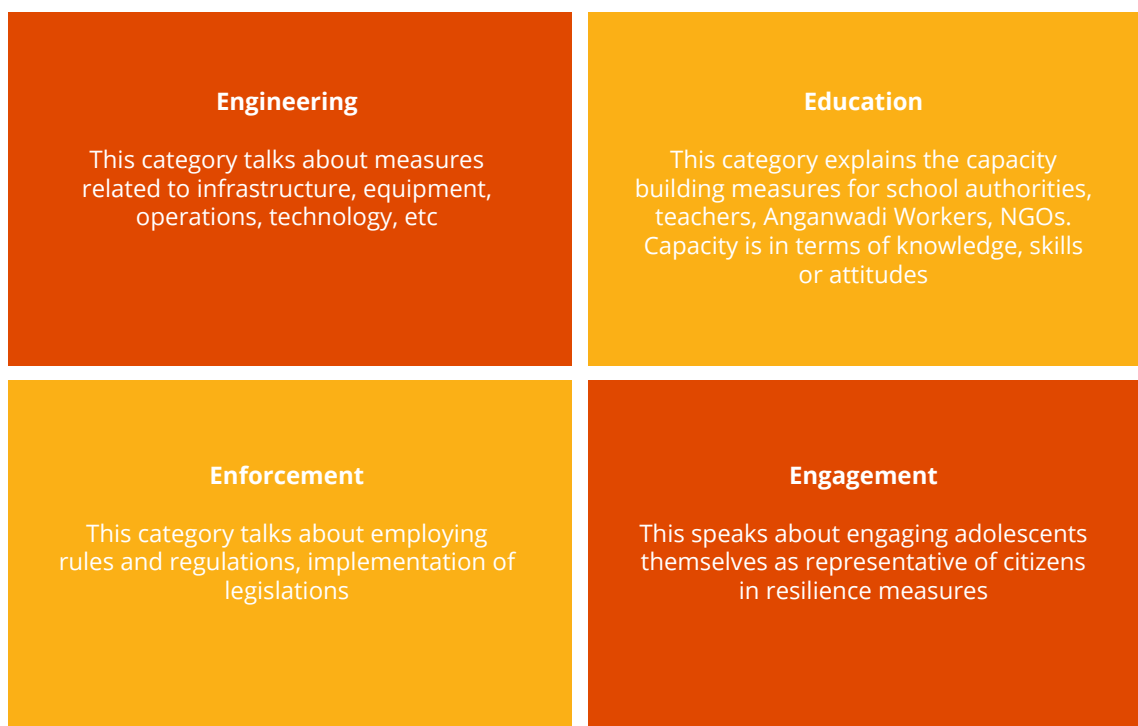
Figure 6: 4Es conceptual framework Do's and Don'ts
(Source - UHCRCE climate thematic workshops with city partners 2017-19)

- **Engineering**

  1. Ensure accessibility measures in school design for children with physical and mental disabilities. School Safety efforts need to take cognizance of all kinds of hazards that may affect the wellbeing of "all" children. The measures including disability-specific building structures, facilities and equipment should be ensured. The maintenance and mock trials ensure functioning and response system in time at the time of disaster/ extreme weather

  2. Ensure resilience measures to decrease the physical vulnerability. Children, especially children with disabilities are at a higher risk of experiencing negative impacts during disasters because of vulnerable structural and non-structural disaster resilient factors. The structural factors include dilapidated buildings, poorly designed structures, faulty construction, poorly maintained infrastructure, loose building elements, etc. In contrast, the non-structural factors include loosely placed heavy objects, infestation of the campus by snakes and any other pests, broken or no boundary walls, uneven flooring, blocked evacuation routes, poorly designed and placed furniture that may cause accidents and injury, inadequate sanitation facilities etc.

  3. Ensure that all development actions taken even in non-emergency times are designed with a view to ensuring their performance during emergencies.

  4. Demonstrate how AWCs, childcare institutions and NGOs can minimize the physical vulnerability by setting the example of school infrastructure, retrofitting for them.

- **Education**

  1. Raise awareness among the stakeholders like school authorities, teachers, etc., on how disaster risk and climate change affect the rights of children and youth.

  2. Develop information and communication strategies that highlight the importance of the protection of vulnerable groups of children in situations of emergency or disaster.

  3. Training of persons responsible for the implementation of emergency care plans, the impact that these have on children, risk factors and possible violations of rights that can be generated.

  4. Prepare guidelines for children to orient them about risks and action points.

  5. Carry out the mock drills as per the local area vulnerability plus general action guidelines for any hazard.

- **Enforcement**

  1. Regularly conduct monitoring of risks and revision of the plans. There is a need for policy and protocol guidelines for schools of special children. Benchmark assessment (may be self-assessment) of preparedness and monitoring can be initiated.

  2. Ensure "a school safety advisory committee" and "the school management committee" inclusive of stakeholders concerned with especially vulnerable children in the neighborhood.

  3. Generate institutional coordination between schools and other stakeholders like AWCs, NGOs, local leaders and Integrated Child Protection Units (ICPU) through mechanisms for the comprehensive care of children and youth that allow specific actions for this group in an effective and timely manner in the event of emergency or disaster.

  4. Develop manuals, plans and protocols to ensure the protection of children and youth at risk of disasters or affected by situations of emergency or disaster

  5. Develop monitoring and complaint mechanisms to the violation of rights of children and youth exposed to disaster risks or emergencies or disasters. Representation of parents and community around must be ensured.

- **Engagement**

  1. Promote the participation of children themselves and their caregivers in the processes of risk assessment for the identification of needs to the authorities and awareness of the context by the population.

  2. Promote the incorporation of vulnerable children and youth in all local activities for school and community disaster preparedness.

  3. Promote the use of participatory techniques for the general population, children and youth in particular for the identification of self-protection strategies and the establishment of procedures for protection. Such citizen engagement techniques are more appropriate and effective before exposure to disaster risks or emergencies or disasters.

4. Facilitate dialogue among the community leaders, local authorities, children, and youth on the protection against the disaster risk and the climate change.

5. Empower students through life-skill education process for preparedness.

Partnerships	Identification of stakeholders working with especially vulnerable children, formal partnerships, and periodic joint meetings.
Assessment	Mapping of especially vulnerable children from school neighborhood, regular update of the database.
Joint Trainings	Cross learning training of school functionaries along with caregiver stakeholders of especially vulnerable children. These stakeholders include AWWs, NGO-CBO groups, school monitoring committees and informal community leaders.
School disaster management plan	A dedicated section for especially vulnerable children in school disaster management plan with defined roles and responsibilities of each stakeholder.
Actions in Routine	Networking, SBCC and participatory actions in routine by schools will strengthen the actions during disasters.
Research and documentation	Capturing the institutional and individual memories once disaster happens is necessary for schools to reflect on lessons learnt and improve.

Table 3: Action Plan for schools

(Source - UHCRCE climate thematic workshops with city partners 2017-19)

How can the participation of vulnerable children act as a solution for integrating them in school resilience? (Demonstration of Surat City)

Partnerships

School level disaster resilience models for integration of especially vulnerable children's well-being will be unsuccessful if stakeholders are working in silos. Schools must join hands with other parallel programs (like ICDS and ICPS), NGOs, academia, civil society and neighborhoods to develop the maximum potential of city to seek children's true participation.

For instance, Urban Health and Climate Resilience Centre of Excellence (UHCRCE) is a Public Private Partnership (PPP) based trust hosted by Health Department of Surat Municipal Corporation (SMC).

The center through various projects and programs strives to bring into consciousness, learn, act and advocate child inclusion and rights within the city. UHCRCE identified 45 key institutions working directly or indirectly either with school or with especially vulnerable children. This "multi-stakeholder" think tank participated in planning (2) and thematic (6) workshops to exchange ideas, build conceptual framework of disaster resilience, identify local indicators and prioritize key actions.

The thrust principles of these integrating resilience activities were – "Meaningful participation of schools, children and other stakeholders to strengthen the abilities of schools during disasters or emergencies." Some important actions that can be referred by Urban Schools are:

Action-1 Climate data monitoring by children from special schools

Children With Special Needs (CWSN) is one of the marginalized group of children in cities. They are often sympathized for their situation but hardly are involved in civic participation actively. UHCRCE under

"Child Friendly city" activities have captured the voices of children with hearing and speech disabilities. They spontaneously raised the concern of air pollution, noise pollution, road safety, etc. Some of their feedbacks were noted to bring them to notice to city authorities.

Figure 7: Students getting training on Environment Monitoring Kit

(UHCRCE Project Document for Earth Leaders Program with TARU Leading Edge and CDKN- 2019)

Action-2 Peer education by school children to out-of-school children

Communication beyond posters and pamphlets is the objective of Social Behavior Change Communication (SBCC) strategies. Peer education (buddies) was used as innovative and participatory forms of communication between in-school and out-of-school

children. They were more efficient in integrating out-of-school children with school level resilience activities. "Children to Children" model creates more interest and dialogue among the recipient peers. Heat stress, flood resilience, Malaria-dengue fight, action against swine-flu, insist for motorbike pooling, food safety, and healthy diet practices, green Surat and saving electricity were the topics of discussion.

Figure 8: Interaction between school children to out-of-school children

(Source- UHCRCE Project document under "Child Friendly Smart City Knowledge Centre" initiative by SMC and UNICEF- 2019)

Action-3 Life Skills Education (LSE) clubbed with disaster resilience

Life skills are a large group of psycho-social and interpersonal skills which can help adolescents to make informed decisions, communicate effectively and provide self-management skills that may help an individual to lead a healthy and productive life. Eight internationally recognized life skills involve - Problem Solving and Decision making, Critical Thinking, Creative Thinking, Empathy, Understanding Self and Understanding Emotions. Decision making for pre-monsoon flood preparedness, critical thinking for waste segregation, and creative thinking for climate change communication were some examples where modules emerged linking life skills with environment and disaster resilience themes.

Figure 9: Interaction between LSE volunteers and school children
(Source – UHCRCE Project documents for Community Mental Health Program with SMC -2019)

Action-4 Incorporating the demands of especially vulnerable children for building school level disaster resilience

On occasion of World Children's Day 2018, Child Friendly Smart City Knowledge Center released the "Children's Charter of Demands". It documented the children's vision, expectations, concerns and need for the *"Salamat, Swachchh, Shikshit, Saksham, Sabka Surat"*. The Children's Charter of Demands is acting as a guide for the city to achieve child friendly and sustainable development. This was the first charter 'by the children, for the children'. The key feature of Charter was that participants included children in-school, out of school, with special needs, of all socio-economic classes, gender and geographical zones within city.

Some key demands that emerged for the school level disaster resilience were as stated below:–

1. More number of trees and green spaces

2. Development of places like river-front walkway- to provide comfort during heat stress

3. Measures for river Tapi cleanliness & water pollution monitoring

4. No industries in residential area

5. Provision of housing-livelihood substitute to people who encroach the roads

6. Slums to be located at safe sites to prevent flood risks

7. Disaster warning systems with reach to everyone

8. Fire stations to prevent accidents due to fire, should reach to everyone

9. Control measures for no open littering, indiscriminate garbage disposal practices

10. Cleanliness in the informal settlement areas

11. Adequate dustbins and regularity in door-to-door garbage collection

12. Fogging, mosquito repellents, mosquito nets use, clearing water logging

13. Water logging issues

14. Dedicated evacuation centers for emergency situations like floods

15. Presence of ramps, functional lift at health and other institutional care services for children with physical disabilities

Action-5 Research with, by and for special vulnerable children

Children are enriched with experience-based knowledge and their voices must be captured. The participatory mixed method (Qualitative and quantitative) research including special vulnerable children was conducted by UHCRCE. Pilot assessments of schools and Anganwadis (Early childhood centers for urban poor and migrant children and out of schoolgirls), climate audit of schools, vector borne disease surveillance in schools, dropout children assessment in neighborhoods– were carried out in smaller scale to cultivate the culture of evidence-based actions to link with school level disaster resilience.

Figure 10: Picturing the flood resilience by out of school children

(Source: Ghanekar, A. Desai V.K. Desai H. Rathi S. Acharya A. & Khatri K. (2014). Building Resilience to Urban Health and Climate Change: Can Adolescents in Urban Slums Be the Answer? Asian Journal of Research in Social Sciences and Humanities, Vol. 4, No. 11, November 2014).

Disaster Management course in Nahur,Mumbai - Source - Aniruddhas academy of disastermanagement

05 SELF-ASSESSMENT OR RESILIENCE CHECKLIST FOR SCHOOLS

In case of a tragedy, students and teachers alike should be informed on what they should do and not do. In the labs and kitchen areas, directions can be explicitly written. For students, educators and their families, the Do's and Don'ts on different types of disasters are provided in this handbook and checklist is also provided below:

SR. NO.	ACTIVITIES	YES/ NO
1	Have the emergency Telephone/Contact numbers been confirmed with the concerned departments?	
2	Are the potential risks within and up to a kilometer from the workplace identified?	
3	Does the plan clearly mention the evacuation plan?	
4	Are the roles and responsibilities of key personnel's taskforce team leaders, class teachers, office staff and students clearly defined?	
5	Are the staff responsibilities to account for, and supervise students during and following the emergency clearly described?	
6	Does the plan give emphasis on the children below class V?	
7	Does the plan address the students with special physical, mental and medical needs?	
8	Does the plan describe about how the staff will be trained and when exercise will be conducted?	
9	Has the plan been endorsed by local police and fire brigade?	
10	Are arrangements for reviewing the plan described?	
11	Do all students/teachers know the team numbers?	
12	Does the plan having provision for replacing/co-opting new members?	

Answering the following type of questions can help further in assessment and defining action plan:

QUESTIONS	IF YES, THEN WHAT NEXT	IF NO, THEN WHAT NEEDS TO BE DONE
Has the school building been assessed for earthquake/ cyclone/ flood safety?	Check if emergency evacuation plan is in place;	Connect with the local administration on building plan approvals and seek assistance for risk assessment.
Do we have an evacuation plan in place?	Conduct mock drills as per evacuation plan	Draw an evacuation plan consistent with local disaster management plan and in consultation with local authorities responsible for disaster management plan and implementation.
Have we checked all doors and windows, fences, all structures – are they intact, is there any risk?	Run awareness program with children such that they can identify such incidents and report.	Repair the structure(s) as needed and ensure preventive maintenance work is being done on periodic basis
Have we demarcated a dedicated place for assembly during disaster?	Conduct mock drills as per evacuation plan, to make sure all children and staff are aware of assembly location.	Demarcate an open space away from the buildings for assembly/ congregation
Are the pathways to the assembly point(s) free for all movements?	Conduct mock drills to ensure everyone is familiar with evacuation plan and paths.	Free pathways of stationary equipment to allow free movement, ensure no obstructions are present.
Are these pathways convenient for speciallyabled children/ person?	Train children and familiarize them with the evacuation plan, to ensure that they are sufficiently equipped.	Ensure barrier free accessibility. This may include building of ramps, handrails, tactile warning strips etc. Refer: CPWD Handbook.
Is the early warning system in place? Is the communication system working? Are we connected with the local authorities to receive early warnings?	Run mock drills to ensure warning system will be activated, even in case of loss of power. Mock drills will also help local authorities to identify any service gaps.	Set up system by assigning team responsible for early warning and dissemination. Put into place a communication system that includes television, radio, mobile and land-phones for the same. Contact local authorities responsible for disaster management to ensure warnings will be communicated.

ANNEXURE 1
ROLES AND RESPONSIBILITIES

The following section outlines the key roles and responsibilities for various stakeholders. These responsibilities are divided into pre, during and post emergency periods. It is suggested that stakeholder become thoroughly familiar with their respective roles and responsibilities and ensure that they are followed by each letter and spirit. The content of this section has been taken from various sources being suggested and practiced by various schools.

Principal/Head of the School
- *Pre-Disaster/ Emergency*
  - o Chairs the School Disaster Management Committee.
  - o Ensures that School Disaster Management Plan is developed, evaluated and updated regularly (once a year and after a disaster).
  - o Ensures that all staff and students are fully familiar with the School Disaster Management Plan.
  - o Ensures that emergency drills are conducted regularly.
  - o Ensures off-site back-up of important school records.
  - o Ensures that all staff and students receive basic first aid training.
  - o During Emergency
- *During Disaster/ Emergency*
  - o Share information with local authorities and advices on evacuation based on the best judgement in the event of an emergency.
  - o Responsible for setting in place procedures for informing parents.
- *Post Disaster/ Emergency*
  - o Gives the "all clear" instruction after a disaster.
  - o Ensures that School Disaster Management Plan is updated.
  - o Ensures a needs assessment is carried out.
  - o Ensures that schooling is resumed as soon as possible.

School Disaster Management Committee
- *Pre-Disaster/ Emergency*
  - o Prepare School Disaster Management Plan and evaluate and update at regular intervals (once a year and after a disaster).
  - o Supports Principal/Head of the School in ensuring that all staff and students are fully familiar with the School Disaster Management Plan.
  - o Identify Evacuation Centres and Temporary Learning Centres and make arrangements with land/property owners.
  - o Prepare and support the organization and delivery of awareness programs on disaster management for school community.
  - o Facilitates the organization of training on disaster management issues.
  - o Identify and advise on purchase of equipment for emergency situations.
  - o Carry out regular review of the structural safety requirements of the school for various hazards (earthquake, fire, cyclone, floods, etc.)
  - o Recommend funding arrangements for carrying out preparedness and mitigation measures in the school through school funds and other sources.
  - o Prepare guidelines and procedures for emergency drills.
  - o Liaise with curriculum development division of Education Department /National Disaster Management Authority (NDMA) to develop and disseminate materials, posters, pamphlets, simple tips on dos and don'ts on different disasters.
  - o Keep an updated list of important telephone numbers and radio contacts in case of emergency.
- *During Disaster/ Emergency*
  - o Assist the Principal/ Head of the School in facilitating and coordinating the emergency plans.
- *Post Disaster/ Emergency*
  - o Evaluate and update School Disaster Management Plan.
  - o Assist in assessment of the extent of damage.
  - o Conduct a needs assessment.
  - o Develop, facilitate, coordinate and implement recovery plan, including for continuity of schooling.

Disaster Awareness Team
- *Pre-Disaster/ Emergency*
  - o Assist in organizing of the evacuation drills for various hazards
  - o Work with the Warning & Information Dissemination Team in making students, faculty, and staff aware about the different warning levels and the colors and locations of flags / signs that will be used.
- *During Disaster/ Emergency*
  - o Duck, cover and hold at first sign of earthquake. Hold on to furniture legs if furniture moves. If outside, move away from buildings.
  - o In case of other hazards, assist the Evacuation Team in evacuation of the school building.
  - o For a chemical hazard, assist the Warning Team in disseminating the required safety tip to the entire school.
- *Post Disaster/ Emergency*
  - o Disseminate information on do's and don'ts so that the situation doesn't worsen, in coordination with the Warning and Information Dissemination Team.

Early Warning and Information Dissemination Team
- *Pre-Disaster/ Emergency*
  - o Monitoring and taking regular updates from TV/ Radio/Internet on the potential hazard that school can face, e.g. weather updates in case of floods, landslide, cyclones etc.
  - o Inform the school authorities of any impending hazardous situation
  - o Maintain contact with local authorities and communicate any directions to the school authorities
  - o Post warning signs / flags of appropriate colour for different warning level at prominent and designated places in the school.
  - o Disseminate the information to all the classrooms and teachers
  - o Coordinate with the other teams and inform them about the latest weather / warning situation
- *During Disaster/ Emergency*
  - o *Duck, cover and hold at first sign of earthquake. Hold on to furniture legs if furniture moves. If outside, move away from buildings.*
  - o *Cross check the warning received from various sources*
  - o *Warning the school in case of an emergency by either ringing a bell/siren or on the public address system or through a messenger, whatever is available in the school*
  - o *Reporting to the school disaster management committee about the disaster in the school building*
  - o *Reporting to the government emergency response departments (Fire, SDM, Police etc.)*
  - o *In case of the school being used as a shelter, inform the shelter staff about the latest updates and weather reports.*
- *Post Disaster/ Emergency*
  - o Continue monitoring the various information sources
  - o Keep reporting on the situation of the disaster to all concerned teams and coordinate with them
  - o Disseminate safety tips in coordination with the Awareness Generation Team
  - o Work with the Incident Management Team from the local administration in preparing updates and disseminating information

Disaster Response Team
- *Pre-Disaster/ Emergency*
  - o Check the exits
  - o Identify the open areas where the school can assemble after evacuation in an emergency
  - o Make sure there are no hazards present for evacuating to the designated area
  - o Make sure that necessary supplies are accessible
  - o Assist the Planning Committee in developing options in the event evacuation is required during inclement weather
  - o Be prepared for special equipment needs for mobility-impaired students
  - o Any special response procedure for special needs students must be tested during drills
  - o Conduct regular drills in coordination with the other teams and practice the different evacuation procedures used in different hazards
- *During Disaster/ Emergency*
  - o Duck, cover and hold at first sign of earthquake. Hold on to furniture leas if furniture moves. If outside, move away from buildings
  - o Evacuate in an orderly fashion as practiced in the drills

- *Post Disaster/ Emergency*
    - o Ensure that emergency assembly area is accessible and safe
    - o Determine if any additional assistance is required for evacuation.
    - o Take roll call and report group status to Administrator (Emergency Operations Centre).

Site Security Team

- *Pre-Disaster/ Emergency*
    - o Work with the Planning Committee, the School Administrator and the local authorities to establish a release policy and communicate this policy to parents and staff.
    - o Develop procedures for how release will be handled.
- *During Disaster/ Emergency*
    - o Duck, cover and hold at first sign of earthquake. Hold on to furniture legs if furniture moves. If outside, move away from buildings.
- *Post Disaster/ Emergency*
    - o Lock all external gates and doors, and secure buildings. (Note: Be sure locked doors can be opened from inside to prevent entrapment.)
    - o Station one team member at main gate/front door to deal with community/parents. Have that member route fire, police, rescue and medical to area of need.
    - o Keep the Administrator (EOC) informed of activities.
    - o Release students according to pre-arranged policy.

Fire Safety Team

- *Pre-Disaster/ Emergency*
    - o Make sure fire-fighting equipment (extinguishers, etc.) is in working order and that staff has received training in its use
    - o Ensure that all non-structural earthquake hazards that can be cause of fire (i.e. Chemical Laboratories, Cafeteria Kitchens, hot water tank) are properly secured
    - o Coordinate with the SDMC in ensuring that a fire safety assessment of the school premises is conducted by the local fire department and that the recommendations are implemented
- *During Disaster/ Emergency*
    - o Call the local fire-fighting team and support other teams in evacuation
    - o Control fire, if possible (ensure personal safety)
    - o In case of electrical fire, turn off the electric main switches
- *Post Disaster/ Emergency*
    - o Check for and confirm existence of fire. Report location to local administrator (EOC) and Site Security team
    - o Look for conditions that may cause a fire to develop and seek maintenance staff assistance in removal of condition.

Bus Safety Team

- *Pre-Disaster/ Emergency*
    - o Know school policy for procedures in the event a damaging earthquake occurs while buses with students are enroute to or from school.
    - o Assist SDMC in providing 2-way radio communications capability between buses and school administrators.
    - o Carry emergency cards with information on contact numbers for the school EOC, and important district contact numbers (district administration, police, fire, medical, etc.)
    - o Take First Aid Training.
    - o Develop plans to assist special needs students.
- *During-Disaster/ Emergency*
    - o Pull over to the side of road if possible, in the open. (Not under an overpass or bridge or alongside buildings or trees.)
    - o Instruct the passengers to crouch down between seats and in isle until shaking has stopped.
    - o Ensure special needs students are assisted.
- *Post-Disaster/ Emergency*
    - o Assist any injured students providing First Aid as needed.
    - o Establish communications with School EOC
    - o Implement school policy for earthquake occurrence while students are enroute to or from school.

ANNEXURE 2
EARTH LEADER'S PROGRAM (SURAT AND AHMEDABAD)

The program was basically to create awareness among children regarding changing climate and to provide them an understanding of the data that is reflected in the Environmental Sensors. There were training sessions organized by the team of Taru Leading Edge in 7 schools from Surat and Ahmedabad as a pilot project. These schools include - Pranam Higher secondary school, Thaltej Municipal School 1 and 2, Ashadeep School No. 4, Mukbadhir Vikas Trust School, Municipality School no 326.

Following photographs provides an overview of the program:

Details of Training	The training was based on understanding and installing Air Quality monitoring sensors in the school. It included training awareness in environmental challenges, developing sensor-based kits for environment monitoring. Basic understanding on urban heat island effect, heat waves, smog and climate change was also provided in the classroom session. It also include understanding on ambient temperature, relative humidity, PM2.5, PM10 and CO2 sensors. After the classroom session, students were divided in 7 groups with 7 children in each group for live demonstration and practical work. A hands-on training was provided using sensors, micro-processors, LCD displays and basic programming. Children are also trained on how to use the data and share with the local authorities. This training was done with school principal and science teachers as they are going to monitor sensor data from the web portal. After continuous monitoring of environment data by school children, "Earth Leader" certificate will be provided to recognize the efforts of students for their contribution and participation.

Earth Leader for Environment Monitoring
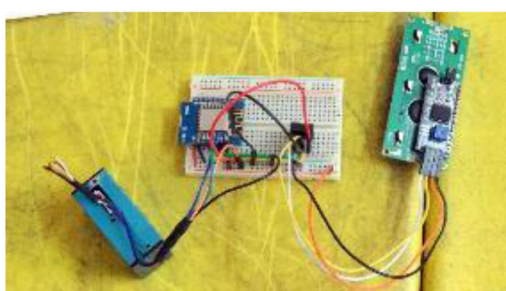
Earth Leader Workshop Photographs
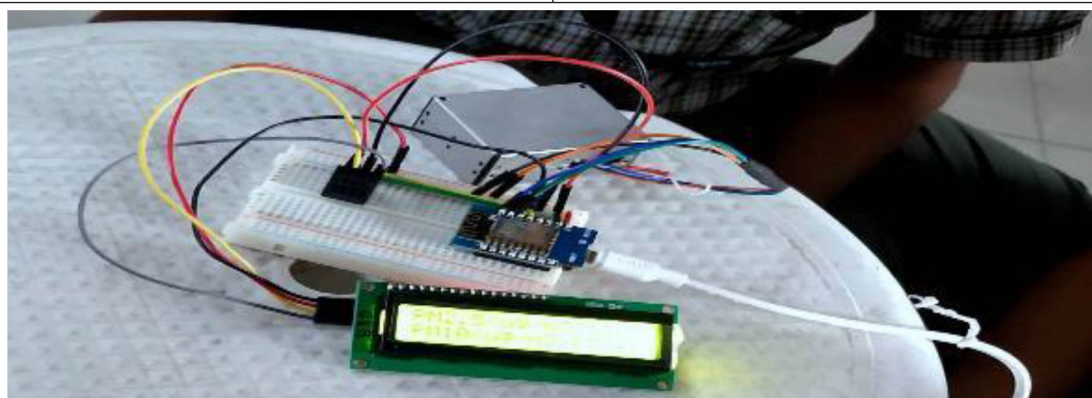
Earth Leader for Environment Monitoring

Workshop Participants
From Left: Tejas Patel, Nirav Trivedi, Ishan Trivedi,
Mr. Kaushikbhai Patel (Science teacher)

Earth Leader for Environment Monitoring

"We have undertaken the project to understand the pollution levels. By giving examples we came to know how they will affect us. It will not be visible through but they are affecting our health. We need to plant more trees around our school."

"We made the circuit from pollution measuring sensors. We have not only measured the pollution levels but we have to stop it. We have to make people aware not to smoke. They will injorious to their health and our health also."
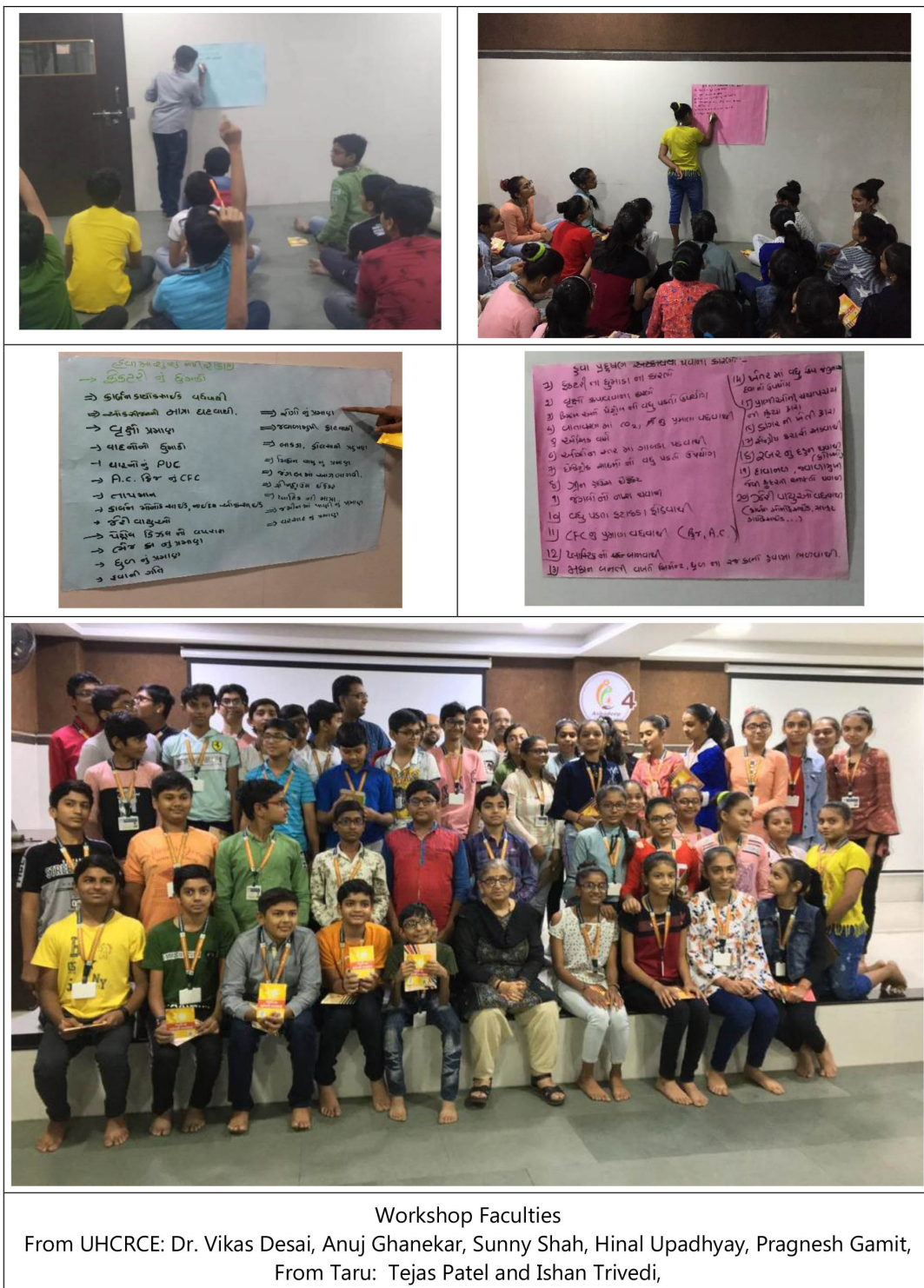

"We are making circuits in Vikram Sarabhai Center. But this is quite different form them. We cane to know about Green house effect is causing the problems related to enviornment and how it can affect to it. We are burning the solid waste and papers in open. We should stop this type of polluiton causing by us."

"We are happy to learn about the various types of enviornment sensors. We are thankful to CDKN and Taru for giving us an opportunity to establish our Enviornment Lab and by providing the Enviornment Measurement Kit. We will mesure our school enviornment and give us our contribution for monotoring the Temperature, Humidigy, PM 2.5, P.M 10 and CO."

Earth Leader for Environment Monitoring

Workshop Faculties
From UHCRCE: Dr. Vikas Desai, Anuj Ghanekar, Sunny Shah, Hinal Upadhyay, Pragnesh Gamit,
From Taru: Tejas Patel and Ishan Trivedi,

Children's experience during the workshop

Well-versed with experience based and scientific knowledge of climate change, children enthusiastically made the list of factors contributing the degraded air quality. The factors included global as well as local factors – gases from factory emissions, increasing gases like CO2, SO2, NO2, methane in air, construction industries and use of cement-dust, combustion of coal, use of pesticides in agriculture, animal husbandry, increasing use of electricity in daily life, cutting down the trees, deforestation, vehicles, increasing use of petrol and diesel, fire crackers, using CFCs for ACs, use of plastics, improper waste disposal, depleting ozone layer, green-house effect, acid rains, volcano eruption. Children were also vocal about how different factors can be measured related to climate change. These include CO2, oxygen, temperature, humidity, particulate matter, wind speed, poisonous gases, pollution levels, rainfall, groundwater levels, vehicles density, number of trees, season-wise diseases, noise pollution, use of petrol diesel etc.

Children were divided into two groups for an interactive session where they listed some of the elements that can be measured in air and how air is being polluted from our daily activities. They enlisted some of the core reasons and then combined all the issues of both the groups. Team Taru explained them the particulate matter in air and their content (PM2.5 and PM10) and demonstrated the assembling of the temperature and humidity mapping toolkit. They were divided into groups of six-seven each and given one kit box which they had to assemble themselves. They followed the instructions step by step and successfully assembled the tool kit. They noted the readings of temperature, humidity and PM2.5 and PM10 levels displayed in LCD of the assembled gadget in a tabulated format in their notepad. They were excited to see the variation in temperature and PM levels whenever a lighted matchstick or an incense stick was brought near to the sensor. One student asked if this can be connected with the wifi, another student asked of this is more accurate than the weather app of the phone. Their queries were answered individually. In the end they exclaimed that they enjoyed the workshop and committed as an Earth leader fellow to take readings every day at different times of the day.

Children were explained their role as peer educators at the end for monitoring climate parameters and educating other students/ family members.

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EMERGENCY & DISASTER PREPAREDNESS FOR URBAN SCHOOLS

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