03

Safe Schools Guide for Latin America and the Caribbean

UNDRR
Oficina de Naciones Unidas para la Reducción del Riesgo de Desastres

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

Safe Schools Guide for Latin America and the Caribbean

Edgar Armando Peña Figueroa and Jair Torres

SEPTEMBER 2021

Contents

Who is this guide for?

This guide seeks to support public sector actors, implementers and managers of educational infrastructure programs in strengthening school safety from the prevention and management of disaster risk.

Considering that the improvement of learning, skills and performance of children in schools in the region promotes human, social and equitable and solidary development, and that educational infrastructure has a very important role to play.

Acronyms

CCA: Climate Change Adaptation

CENEPRED: National Center for Disaster Risk Reduction and Prevention

CDEMA: Caribbean Disaster Emergency Management Agency

CISMID: Peruvian-Japanese Center for Seismic Research and Disaster Mitigation

WSSD: World Summit on Sustainable Development

COP: Conference of the Parties

CRED: Centre for Research on the Epidemiology of Disasters

CSSI: Caribbean Safe Schools Initiative

IDNDR: International Decade for Natural Disaster Reduction (sic) 1990-1999

DIGAR: Dominican Republic General Direction of Environmental Risk Management

DIPECHO: European Commission Disaster Preparedness Programme

EM-DAT: Emergency Events Database

FIC-UNI: School of Civil Engineering of the National University of Engineering

GADRRRES: Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector

GPS: Global Positioning System

DRM: Disaster Risk Management

INEE: Inter-Agency Network for Education in Emergencies

INDECI: National Institute for Civil Defense of Peru

IPRED: International Platform for Reducing Earthquake Disaster

ISCE: Safety Index for Educational Centers

CSSF: Comprehensive School Safety Framework

SDG: Sustainable Development Goals

OIEWG: Open-ended Intergovernmental Expert Working Group

UN: United Nations Organization

NGO: Non-Governmental Organization

PAO/WHO: Pan American Health Organization

SPRINT-Lab: Safety and Protection Intersectoral Laboratory, University of Udine, Italy

DRR: Disaster Risk Reduction

TPKE: Thematic Platform on Knowledge and Education

UNESCO: United Nations Educational, Scientific and Cultural Organization

UNDRR: United Nations Office for Disaster Risk Reduction

UNICEF: United Nations International Children's Emergency Fund

VISUS: Visual Inspection for defining Safety Upgrading Strategies

WISS: Worldwide Initiative for Safe Schools

Introduction

Most countries in the world recognize the need to ensure that schools are safe places and provide the conditions needed to face different climate, geological, and biological hazards, among others, that may affect the normal course of educational activities and the welfare of people whose activities take place at learning facilities.

Disasters associated with natural phenomena affecting school infrastructure can have a tremendous impact on children, youth, teachers, other school staff, and educational systems in general.

Studies on disaster trends and the consequences of climate change suggest that 175 million children are likely to be affected every year by climate-related hazards alone. If the impact of other latent hazards (such as biological, environmental, chemical, technological, and social) is added to this estimate, the task of ensuring the resilience of schools and education is essential to guarantee the right to education, while meeting the main goals of the United Nations 2030 Agenda for Sustainable Development.

Based on interest in establishing a culture of safety and resilience at all levels of society, and specifically in the education sector, CAF – Development Bank of Latin America in alliance with the United Nations Office for Disaster Risk Reduction (UNDRR) developed the ***Safe Schools Guide*** as a contribution to strengthening the technical support it provides to ensure that education infrastructure projects meet not only educational needs but also safety needs.

This guide is an effort to provide decision makers in ministries of education in Latin America and the Caribbean with the tools and information that will help them decide where and how to invest available resources more efficiently to increase safety at learning facilities, and to support education ministries and their strategic partners in their efforts to build and strengthen their capacity for evaluating educational infrastructure, managing disaster risk at schools and providing education for resilience.

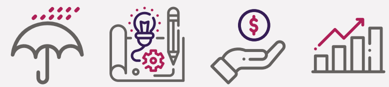
This guide draws on the **Comprehensive School Safety Framework** designed by the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES), which includes the United Nations Office for Disaster Risk Reduction (UNDRR) and other United Nations agencies and non-governmental organizations committed to reducing disaster risk.

GADRRRES defines a "safe school" as a school site that combines a disaster prevention plan established by its educational policies incorporating all three pillars of the "Comprehensive School Safety Framework:"

1. Safe learning facilities.
2. School disaster management.
3. Risk reduction and resilience education.

The goals of the Comprehensive School Safety Framework (CSSF) are:

1. **Protect** students and educators from death, injury, and harm in schools;
2. **Plan** for continuity of education through all expected hazards and threats;



3. **Strengthen** risk reduction and resilience through education;
4. **Safeguard** education sector investments.

The **Safe Schools Guide** presents part of the global agendas related to children's rights, educational continuity, and educational infrastructure safety, upon which the CSSF is based. Before describing the CSSF's three pillars, this report reviews the UNDRR disaster risk management terminology. Disaster risk management consists of applying policies and strategies to prevent new risks and reduce existing risks.

Recognizing the importance of the three CSSF pillars and how they should be articulated to achieve the goals established—and knowing how challenging it is for countries to distribute resources efficiently for creating and maintaining learning facilities—this guide focuses on actions related to Pillar 1—Safe Learning Facilities. It provides school infrastructure managers in different countries with the technical input to ensure infrastructure safety at all learning facility buildings—both new and existing.

Considering that methodologies are needed to evaluate existing school infrastructure, this report presents two of the main school infrastructure safety assessment methodologies provided by the United Nations: the UNICEF School Safety Index and the VISUS methodology developed by the University of Udine's SPRINT-Lab and adopted by UNESCO. Finally, the guide presents a case study of the implementation of the VISUS methodology in Peru, outlining the steps carried out that led to its effective implementation.

Objectives

The content of this guide aims to:

1. **Strengthen understanding of the CSSF** in the context of the different 2030 Development Agendas, specifically the actions that enable implementation of Pillar 1: Safe Learning Facilities.

2. Increase the capacity of learning facility infrastructure decision makers and planners to include **Disaster Risk Reduction** in their planning and execution activities.

3. Provide **technical guidance** to offices and personnel in charge of school infrastructure maintenance, assessment, and design, i.e., architects, engineers, builders, and school community members who influence the decisions made regarding the selection, design, construction, and maintenance of learning facilities.

4. Develop a series of considerations that should be taken into account when **implementing methodologies** for the assessment of learning facilities.

5. Present the **theory behind the VISUS methodology,** as well as its different phases and implementation results.

The guide's structure follows the **Comprehensive School Safety Framework (CSSF).** It is divided into four sections, each of which contributes to the guide's overall objective by providing an overview of the challenges and opportunities for ensuring safe learning facilities and offering decision-making criteria for establishing strategies to achieve resilience in the educational sector.

Definitions

A review of the main components of risk management and their definitions is needed to better understand the concepts outlined in this guide. These definitions are based on the terminology proposed in 2016 by the Open-ended Intergovernmental Expert Working Group (OIEWG)[1] adopted by the United Nations General Assembly in resolution 71/276 dated February 13, 2017.

Risk

The probability of persons or their material assets, properties, or economy suffering harm and loss as a result of impacts caused by hazards during a specific period and in a known area. In general terms, risk is estimated according to the threats or hazards and the conditions of exposure and vulnerability in a given region.

Systemic Risk

The risk or probability of a complete system being affected, as opposed to adverse effects impacting only some individual parts or components; evidenced by the intrinsic relationship among the parts that constitute the system.

Disaster

A serious disruption of a community or society on any scale due to dangerous phenomena or hazards (natural,

1 Report by the Open-ended Intergovernmental Expert Working Group on indicators and terminology relating to Disaster Risk Reduction. Seventy-first session. Agenda item 19 c). Sustainable development: Disaster Risk Reduction. A/71/644, available at: https://www.preventionweb.net/files/50683_oiewgreportenglish.pdf

anthropogenic or socionatural in origin) that interact with the conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic, and environmental losses and impacts.

Hazards

UNDRR defines hazard as a dangerous process, phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental degradation (page 22, UNDRR Hazard Report, 2019). In the past, hazards were classified according to events generated by natural phenomena, including the categories of biological and extraterrestrial hazards. The new classification includes 302 hazards grouped as follows:

Hydrometeorological hazards: Hazards resulting from the behavior of the atmosphere and its interaction with the land and oceans, through which environmental, climate and water resource distribution conditions develop.

Extraterrestrial hazards: Hazards originating outside the planet, which may involve falling objects such as asteroids or meteorites, or other artificial devices orbiting the earth, such as satellites. They also include solar activity such as solar or geomagnetic storms.

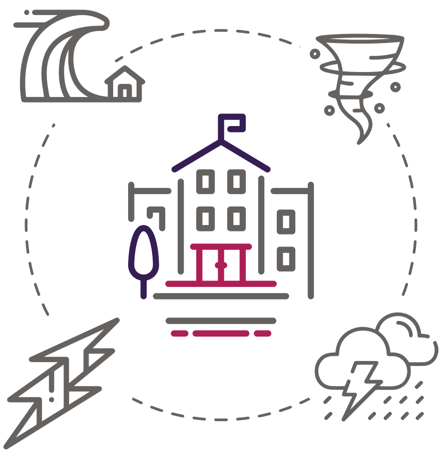
Geological or geophysical hazards: Hazards of geological origin. They are divided into three groups, two related to Earth's internal dynamics, such as seismic and volcanic hazards, and one related to surface dynamics which may cause phenomena such as erosion or mass movement.

Environmental hazards: Hazards related to ecosystem degradation, including air, water, and land pollution, and biodiversity, among others.

Chemical hazards: Hazards caused by the increased use of chemicals in various industrial-type activities such as agriculture and transport, among others

Biological hazards: A group of hazards of organic origin, which may affect humans directly, such as the COVID-19 pandemic, or may affect crops, livestock or other species, causing economic and environmental losses.

Technological hazards: Hazards related to the possibility of failure of some existing or emerging technology. Technologies are expanding rapidly, sometimes becoming essential to ongoing activities, including transportation and communication systems, among others.



Societal hazards: Societal hazards are generated by human activities and may affect the population and its environments. They arise from sociopolitical conditions, economic and cultural activities, as well as individual or group behavior in society, and may lead to loss of life, injuries, social instability and disruption of community activities.

Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the harmful effects of a hazard. As noted by the Intergovernmental Expert Working Group, there are several aspects of vulnerability that arise from physical, social, economic and environmental factors. Examples of these are inadequately designed or poorly constructed infrastructure, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise are prudent environmental management.

Exposure

The population, property, systems, or other components in zones where hazards are present, which are thus exposed to potential losses. As noted in the OIEWG report, measurements of the degree of exposure can also include the number of people or types of assets in a zone. These can be combined with the specific vulnerability of the exposed components to a particular hazard to estimate the quantitative risks associated with that hazard in the study zone.

Capacities

The combination of all strengths, attributes and resources available within a community, society or organization that can be used to achieve common goals. Capacity assessment is the process by which the capacity of a group is reviewed against desired goals, and capacity gaps are identified for further action. Capacity may include the infrastructure and physical assets, institutions, society's coping skills as well as human knowledge, skills and collective attributes such as social relationships, leadership and management.

Resilience

The ability of a system, community or society to resist, absorb, and recover from the negative effects caused by hazards in a timely and resource-efficient manner.

Risk management

The implementation of policies and strategies to reduce the risk of disasters so as to prevent new risks, reduce existing ones, and manage residual risk, thereby contributing to strengthening resilience and reducing losses due to disasters.

Disaster risk management actions can be divided into:

- **Prospective risk management** is concerned with avoiding the occurrence of new disaster risks or avoid worsening existing ones. It focuses on addressing risks that may develop in the future if reduction policies or strategies are not put in place to reduce them. It is worth noting examples such as better land-use planning or disaster-resistant water supply networks.

- **Corrective risk management** seeks to eliminate or reduce short- and medium-term disaster risks through actions or interventions. Examples of corrective management are actions such as reinforcing infrastructure, building dikes, or relocating exposed populations or assets.

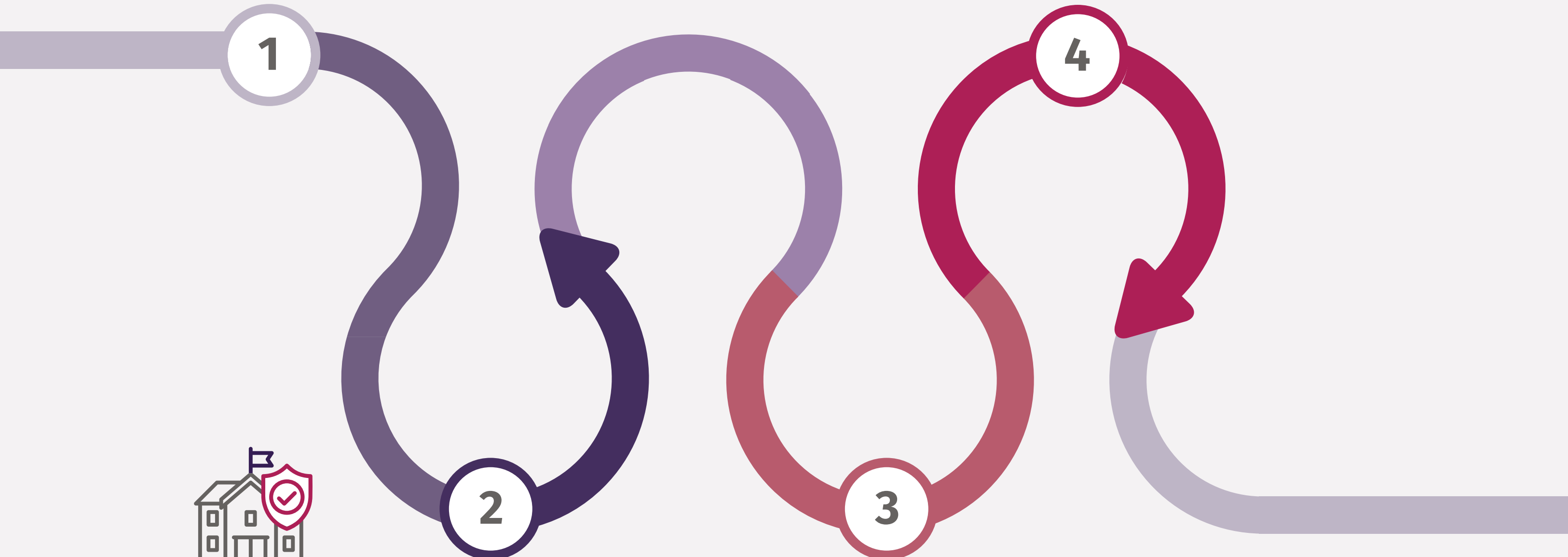
- **Compensatory risk management** includes all activities that strengthen the social and economic resilience of persons and societies in the face of residual risk that cannot be effectively reduced. Residual risk is defined as the risk that remains unmanaged, even when effective disaster risk reduction measures are in place and for which emergency response and recovery capacities must be maintained. It includes preparedness, response and recovery activities, but also a mix of different financing instruments, such as national contingency funds, contingent credit, insurance and reinsurance, and social safety nets.

Development agendas and the Comprehensive School Safety Framework

School safety in the 2030 agenda
Conceptual framework
Technical basis

Experiences in implementing the VISUS methodology

The case of Peru



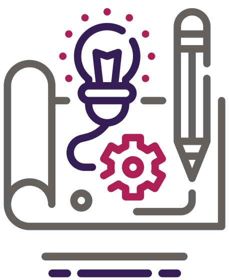
Safe learning facilities

Technical criteria and processes to ensure minimum safety conditions in new and existing infrastructure.

Tools for evaluating school infrastructure safety

Unicef School Safety index
Visus methodology

Sections map. Safe Schools Guide for Latin America and the Caribbean



Section 1

Development agendas and the Comprehensive School Safety Framework

School safety, a historical priority

Disasters have great impact on children and youth, teachers, school personnel and educational systems in general. Studies on disaster trends and the consequences of climate change suggest that every year, 175 million children are likely to be affected by climate-related hazards alone. If the impacts of other latent hazards (such as geological, biological, environmental, chemical, technological and social hazards) are added to this, it becomes essential to ensure resilient schools and education in order to guarantee the right to education, while attaining the main goals of the United Nations 2030 Agenda for Sustainable Development.

The negative effects of hazards plus infrastructure fragility and the population's lack of preparedness lead to disasters with great impact on children, youth, and educational systems. Every year, there are reports of school buildings collapsing or being severely damaged by natural phenomena and resulting in injury or loss of life among students, teachers, and administrative staff. The effects of hazards and disasters also disrupt education, preventing rapid recovery on a macro scale, and may lead to long-term socioeconomic consequences, like in the case of the COVID-19 disaster worldwide.

As a result, there has been international recognition of the need to conduct assessments and interventions such as repair, remodeling, or reconstruction to ensure that existing schools are safer, as well as certify that the large number of schools planned or under construction, particularly in developing countries, are intrinsically safe.

COVID-19 underscored the systemic nature of risk. Its unprecedented cascading effects have impacted every sector and level of our economies and societies, including our educational systems. The impact level of negative effects will make rapid recovery difficult and may lead to long-term socioeconomic consequences.

Due to financial limitations in Latin America, these hazards may compromise strategies for reducing poverty in a country, hinder development progress, and endanger educational systems. Decision makers should therefore consider disaster risk reduction management as a guide to enable them to define strategies to optimize resource use.

The complexity of the context in Latin America and the Caribbean, often characterized by poverty, inequality and internal conflict, is an obstacle to governance, making the population highly vulnerable. Combined with the existence of natural hazards, the impact of this reality on the educational sector, students, teachers and communities is even greater. Due to its geographic location, geology and climate, the Latin American and Caribbean region is exposed to a wide range of natural hazards such as hydrometeorological hazards (including floods, landslides, mudslides, avalanches, drought, windstorms, extreme temperatures and forest fires) and geological hazards (earthquakes, volcanic eruptions, tsunamis, etc.).

Over the 20-year period from 2000 to 2019, the Centre for Research on the Epidemiology of Disasters (CRED) recorded 7,348 events worldwide that led to disasters[2]. These events took approximately 1.2 million lives and affected over 4.03 billion people. On

2 EM-DAT Emergency Events Database: https://www.emdat.be/

average, there were 367 disaster events per year, most of which were floods and storms (44% and 28%, respectively).

Over the same period, there were 1,756 events classified as disasters in the Americas[3] and the Caribbean, including 680 floods, many of which affected educational services in several countries in the region. As mentioned above, the high frequency and impact of disasters in this region are largely due to the different geomorphological characteristics in the continent and the high exposure to the impacts of natural hazards, as well as the high population densities in many disaster-prone areas.

3 The Americas means the set of countries that comprise the three subregions in the American continent: North America, Central America and South America.

EM-DAT's records for the same period also show that storms are the second most frequent type of disaster, after floods. Although storms tend to cover wide swathes of densely populated regions, many island states are particularly vulnerable because they are located in storm paths. In 2017, Hurricane Maria struck the US territory of Puerto Rico, initially causing 64 deaths (according to official estimates) however the death toll was later revised to include approximately 3,000 more deaths due to other effects of the hurricane.

From 2000 to 2019, storms—including hurricanes, cyclones, and storm surges—killed almost 200,000 people worldwide, making storms the second most deadly kind of disaster in the world and the deadliest type of climate-related disaster in the last 20 years.

Hurricane Maria also devastated Dominica, affecting school infrastructure and the right to a safe education. One-third of primary and secondary schools suffered severe damage. It took a month to resume classes, and for several months, many schools taught lessons in temporary tents set up by volunteers with support from UNICEF. In addition to repairing school infrastructure, it was also necessary to renew classroom furniture and replace books and school supplies. The hurricane damaged 42 of the island's 44 water supply facilities, according to data from the national water and sanitation company Dowasco, leaving 95% of the population without supply.

In 2019, Hurricane Dorian struck the Bahamas, leaving at least 370 dead/disappeared—a high number for a country with a population of less than 400,000. Although its landmass and total population are relatively small, the Caribbean has experienced 163 storms over the past two decades, affecting a total of 25.8 million people and causing over 5000 lost lives. Moreover, storms in the Caribbean have caused direct economic losses worth USD 121 billion, a devastating amount for a small region (Human Cost of Disasters, 2020).

In addition to the disasters caused by hydrometeorological and geological hazards, biological hazards have affected educational systems in Latin America and the Caribbean, with 2020 being the year in which negative consequences were most evident. In the region, primary and secondary students lost 158 days of face-to-face schooling on average out of the usual 190 days on the school calendar (UNESCO) as a result of the mandatory closure of schools due to COVID-19.

Likewise, schools and the educational population have been affected by social disasters. From 2015 to 2019, there were reports of sexual violence and recruitment of boys and girls at schools or on their way to and from schools, or military use of schools or universities in Colombia, Nicaragua, and Venezuela. In Colombia alone, the Global Coalition to Protect Education from Attack identified dozens of threats against educators, some of whom quit teaching[4].

Although there is no evidence of any significant effects of chemical or technological hazards in the educational sector in Latin America and the Caribbean, it is important to consider the possibility of this type of hazard, since exposure is latent in many schools in several zones in the region. The 2020 Beirut explosion calls for reflection on this issue. That explosion affected at least 163 public and private schools, which suffered serious to slight damage, requiring urgent rehabilitation, repair, or replacement, and impacted the learning continuity of at least 85,000 students.

When disaster strikes, its negative impacts on education go beyond physical damage. A higher risk of school dropout, greater vulnerability among underprivileged and special needs children, and post-traumatic effects in students are all factors that jeopardize the continuity of education. Table 1 shows some of the impacts of natural events in Latin America.

4 https://eua2020.protectingeducation.org/

Table 1

Impacts of intensive risks of natural origin on the educational system over the past 20 years[5].

Year	Country	Event Type	Impact on the Educational System
2001	Peru	Earthquake	The earthquake affected 98 school buildings in Arequipa.
2001	El Salvador	Earthquake	The earthquake affected 85 schools beyond repair estimated at USD 114 million. One month after the earthquake, during an aftershock, 22 schoolchildren and their teacher lost their lives when a building collapsed.
2003	Dominican Republic	Earthquake	18,000 students lost their classrooms.
2003	Mexico	Earthquake	The earthquake damaged several school buildings in Colima.
2007	Peru	Earthquake	The earthquake affected several schools in Pisco. Those built in accordance with the most up-to-date building codes were not damaged.
2008	Colombia	Earthquake	The earthquake in El Calvario required the structural reinforcement of 17 school buildings between 2008 and 2011, and the restitution of two in 2008 in the city of Bogotá.

5 Adapted and completed based on UNESCO Assessment Guidelines for Reducing Disaster Risk at Learning Facilities in the Context of Disaster Risk Reduction and Climate Change Adaptation. Volume 1.

2009	Costa Rica	Earthquake	The earthquake caused partial damage to 19 learning facilities in Cinchona, in addition to damages that resulted in the total collapse of 8 buildings.
2010	Haiti	Earthquake	About 4,800 learning facilities were damaged or destroyed, including 1,300 schools and all three universities in Port-au-Prince. About half of the country's 15,000 primary schools and 1,500 secondary schools were affected. The school system was unable to cope with the impacts, and two years later, a significant number of children remained out of school.
2010	Chile	Earthquake	The Maule earthquake caused the closure of 1,019 learning facilities and restrictions at 631 schools.
2012	Costa Rica	Earthquake	After the second strongest earthquake recorded in Costa Rica's history, 39 schools were damaged in the Nicoya Peninsula, affecting more than 7,000 students. As of May 2019, the refurbishment of all 39 schools is still pending (Vizcaíno, 2019).
2014	Chile	Earthquake	The Tarapacá earthquake damaged infrastructure at several learning facilities, mainly in Iquique, Alto Hospicio, Pozo Almonte and Huara.

2016	Ecuador	Earthquake	More than 280 schools were damaged, disrupting the education of up to 120,000 children.
2016	Haiti	Hurricane	More than 700 schools were damaged and about 86 schools were used as temporary shelters, disrupting the education of at least 150,000 students.
2017	Mexico	Earthquake	The earthquake caused the collapse in a school building, where 29 children died. More than 16,000 schools were damaged.
2017	Antigua and Barbuda, Cuba, and other Caribbean islands	Hurricane	Schools in Antigua and Barbuda and Cuba, as well as Anguilla, British Virgin Islands, and Turks and Caicos Islands (British Overseas Territories) were damaged, disrupting the education of thousands of children.
2017	Barbuda	Hurricane	Several schools in Antigua and Barbuda were damaged, disrupting education.
2017	Costa Rica	Hurricane	Tropical storm Nate affected 72 learning facilities. 24 school buildings were at risk of landslides, 34 were difficult to access, and 24 lacked basic utilities like drinking water or electricity.

2017	Cuba	Hurricane	Several schools were damaged, disrupting education.
2019	El Salvador	Heavy rains	213 learning facilities were affected by heavy rains and education was disrupted for a total of 10,618 students. 105 schools had some kind of roof damage and 21 schools had perimeter wall damage.
2020	Colombia	Hurricane	Hurricane Iota damaged the physical infrastructure of 6 learning facilities on Providencia Island. Two of them were completely destroyed. Over 1,020 students have not yet been able to return to face-to-face schooling.
2020	Honduras	Hurricane	Hurricanes Eta and Iota damaged 729 learning facilities.
2020	Nicaragua	Hurricane	Hurricane Iota caused damage mainly to the roof and structure of 47 learning facilities.

School safety as a key item on the 2030 agenda

Governments have long assigned a central role to education, which has been widely recognized in international conventions and declarations. In this regard, major efforts have been made to improve the opportunities, quality and relevance of education. Since the Universal Declaration of Human Rights, which states that everyone has the right to education, it has been considered essential for the exercise of most other human rights. The school safety agenda derives from human rights, specifically the right to education. Education provides skills that people need to achieve their full potential and exercise their other rights, such as the rights to life and health.

During the third World Conference on Disaster Risk Reduction, held in 2015 in Sendai, Miyagi (Japan), participating countries reiterated their commitment to disaster risk reduction and the promotion of disaster resilience. As a result, the importance of investing in disaster risk reduction for resilience was recognized as a priority action in the Sendai Framework for Disaster Risk Reduction 2015-2030 (United Nations, 2015)—the Conference's final document—which includes all the priorities, targets and global indicators for school safety. The overall objective is to strengthen resilience in order to achieve the intended reduction in disaster risk and losses.

In parallel, and recognizing that quality education is the basis for improving people's lives and achieving sustainable development, the 2030 Agenda for Sustainable Development adopted in 2015 by the 193 countries represented at the United Nations General Assembly describes in Sustainable Development Goal 4 the commitment to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."

Since 2015, the School Safety concept and the Comprehensive School Safety Framework (CSSF) have been at the center of different development agendas. The roles of school safety and the CSSF were reconfirmed at the UNESCO 2019 World Conference on Education for Sustainable Development and in the release of the 2020-2030 roadmap for Education for Sustainable Development. Annex 1 provides further details on the evolution of School Safety world initiatives and frameworks.

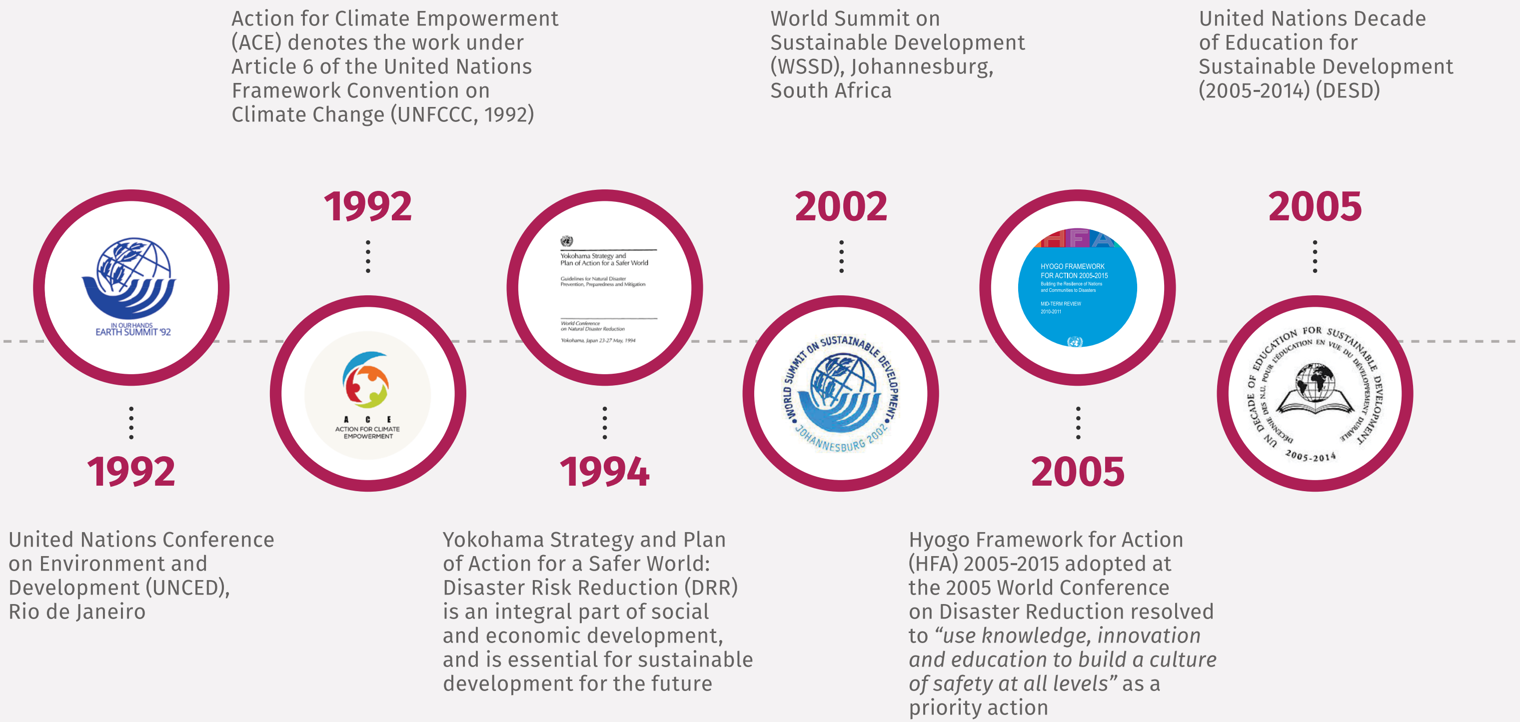


Figure 1. Timeline of world frameworks and initiatives (UNDRR)

2006-2007

UNDRR [illegible]. UNISDR launched the global campaign. Disaster Risk Reduction begins at schools from 2006 to 2007

2007

First Session of the Global Platform for Disaster Risk Reduction (2007). Member states request a methodology for evaluating school safety

2009

During the Second Session of the Global Platform for Disaster Risk Reduction (2009), commitments were undertaken to integrate disaster risk reduction (DRR) into school curricula by 2015

2009

Launch of the Comprehensive School Safety Framework (CSSF) (technical approach defining school safety)

2014

UNESCO World Conference on ESD in Aichi-Nagoya, Japan

2015

Sustainable Development Goals (2015, Goal 4 | 4.7)

2015

Sustainable Development Goals (13.3|2015)

2015

Sendai Framework for Disaster Risk Reduction 2015-2030

2015

Paris Agreement (articles 11 and 12) (2015)

2017

First revision of the CSSF to align it with the new 2015-2030 agendas (2017)

2019

UNESCO World Conference on ESD in Aichi-Nagoya, Japan

2020

UNESCO World Conference on ESD (2021), launch of the 2020-2030 ESD roadmap

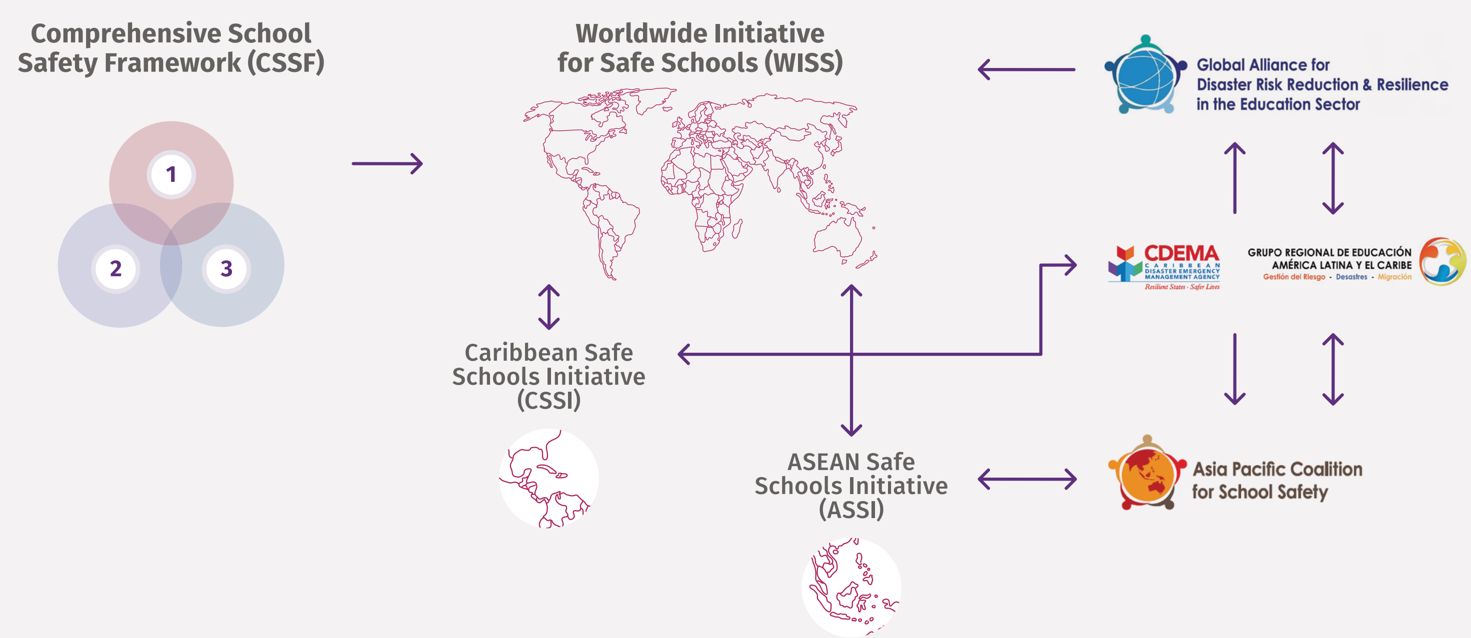
2021

Second revision of the CSSF to integrate a consistent, all-hazards approach for resilience

Regional initiatives for Safe Schools

Internationally, the need to strengthen networking and promote cooperation among countries, regions and regional and international agencies that facilitate strategic work on school safety has become a priority. Two regional initiatives have arisen in recent years to facilitate the attainment of the goals defined by the Worldwide Initiative for Safe Schools (WISS): one in Southeast Asia and another in the Caribbean, as shown in Figure 2.

Figure 2. Regional initiatives for Safe Schools (GADRRRES)



Along with the global initiatives implemented to strengthen educational infrastructure and invest in creating a culture of resilience within schools, many concerns were raised regarding children's rights to receive education in emergency and disaster situations. In Latin America and the Caribbean, these concerns were reflected in the Panama Declaration on Disaster Risk Reduction in the Education Sector, which was signed by 18 countries at the International Conference for Disaster Risk Reduction in the Education Sector in Latin America and the Caribbean in 2011, in Panama City, Panama. The declaration urged Latin American and Caribbean countries to make every effort to implement a policy to assess and improve existing school infrastructure.

Since, in Latin America and the Caribbean, the most significant progress has been made in the Caribbean subregion. To ensure political commitment at regional and national levels, the First Safe School Ministerial Forum for in the Caribbean was organized in April 2017 in Antigua and Barbuda. The main outcomes were the Regional Roadmap for School Safety and the Antigua and Barbuda Declaration on School Safety, which was signed by 12 Caribbean Ministries of Education, and later extended to 18 countries in the framework of the Second Ministerial Forum organized in April 2019 in Saint Vincent and the Grenadines. These documents guide the Caribbean Safe Schools Initiative (CSSI) launched in April 2017 during the Ministerial Forum as the recommended framework for improving school safety in the Caribbean. The initiative is the Caribbean's contribution to the WISS and promotes partnership as a vehicle for the implementation of safe schools. The Ministries of Education lead implementation and receive technical assistance from international, regional, and national partners.

The Caribbean region is experiencing the effects of systemic risk while witnessing the interaction and intensification of the various effects of different events. As national and regional bodies design recovery plans and other documents, they create an opportunity to reiterate:

1. the value of education in the formation of resilient societies, and
2. the need for regional coordination of multiple sectors and stakeholders.

In this vein, the Caribbean Safe Schools Initiative (CSSI), designed to promote safety at schools in the Caribbean, acts as the regional mechanism for ensuring coordination and putting into practice this association between education and resilience. The Caribbean Disaster Emergency Management Agency (CDEMA), with support from the UNDRR

Regional Office for the Americas and the Caribbean, on behalf of the Safe Schools Working Group, organized the webinar "COVID-19, Systemic Risk and Education Sector Resilience in the Caribbean Region" on May 28, 2020. Its main objective was to enable the exchange of experiences so each country could share how their education sector was addressing the pandemic, lessons learned, and recommendations for the sector's response and recovery with regards to the global pandemic, among others.

Some of the main recommendations include the following:

1. The **importance of the Comprehensive School Safety Framework** upon which the CSSI has been structured.
2. **Public health measures** related to schools to ensure that students

On March 15 to 26, 2021, a virtual Pre-Ministerial Forum was held to review the **education sector's COVID-19 response and recovery experiences.**

The forum emphasized the need to coordinate policies and actions for prevention and mitigation in order to develop resilience in the education sector, with the following aims:

- Sustain the **momentum for regional dialogue on safe schools,** despite the challenges of organizing a face to face meeting in 2021.
- Record **good practices and lessons learned from the COVID-19 experience,** including the impact of the pandemic on the design of activities for the hurricane season, as well as other related factors arising within a multi-hazard context.
- Define the **topics to be analyzed at the upcoming third CSSI Ministerial Forum,** which will focus on developing resilience in the educational sector in the Caribbean region.

and educators are safe from death, injury and harm in schools.
3. **Continuity of education** by managing all expected hazards and threats.
4. The nature of **support from regional partners** to promote the CSSI.
5. School preparedness, mitigation, recovery and response for **educational resilience.**

Comprehensive School Safety Framework

All the aforementioned efforts focus on recognizing children's rights to survival and protection, as well as their rights to continuous education and participation. The Comprehensive School Safety Framework (CSSF) unifies these efforts, aimed at enabling educational sector partners to work more effectively and align with similar efforts at global, regional, national, and local levels in all sectors.

The CSSF promotes the WISS and GADRRRES goals. Its objective is to foster school safety as a priority area in the post-2015 frameworks for sustainable development, risk reduction, and resilience.

CSSF's goals are to:

- Protect students and educators from death, injury, and harm in schools;
- Plan for continuity of education through all expected hazards and threats;
- Strengthen risk reduction and resilience through education;
- Safeguard education sector investments.

The aim of the CSSF is to reduce risks from any kind of hazard for the education sector by supporting the following:

- Improve all children's equitable and safe access to a quality, inclusive and integrated basic education.
- Monitor and evaluate the progress of initiatives for disaster and conflict risk reduction.
- Increase availability of and access to hazard-related evidence, such as multi-hazard early warning systems data and disaster risk information.
- Promote risk reduction and resilience in the education sector, including a clear focus in the main international agreements (e.g.,

Sustainable Development Goals, the Paris Agreement on Climate Change, and the Sendai Framework for Disaster Risk Reduction 2015-2030).

- Strengthen coordination and networks for resilience from local to national, regional and international levels.
- Strengthen education governance and local participation in order to prevent and reduce exposure and vulnerability to all hazards and risks, increase preparedness for response and recovery, and strengthen resilience.

The CSSF Pillars

The concept of comprehensive school safety is guided by education policies and practices, in alignment with disaster management at national, regional, district, and local school levels. The CSSF integrates actions that should be performed by the learning facility to reduce risks and promote knowledge of risk management and resilience in the population. To do so, it suggests a series of actions, initiatives and programs, grouped into the three pillars mentioned above (Figure 3):

1. **Safer learning facilities.**
2. **Learning continuity and school safety management.**
3. **Sustainability, adaptation, risk reduction and resilience education.**

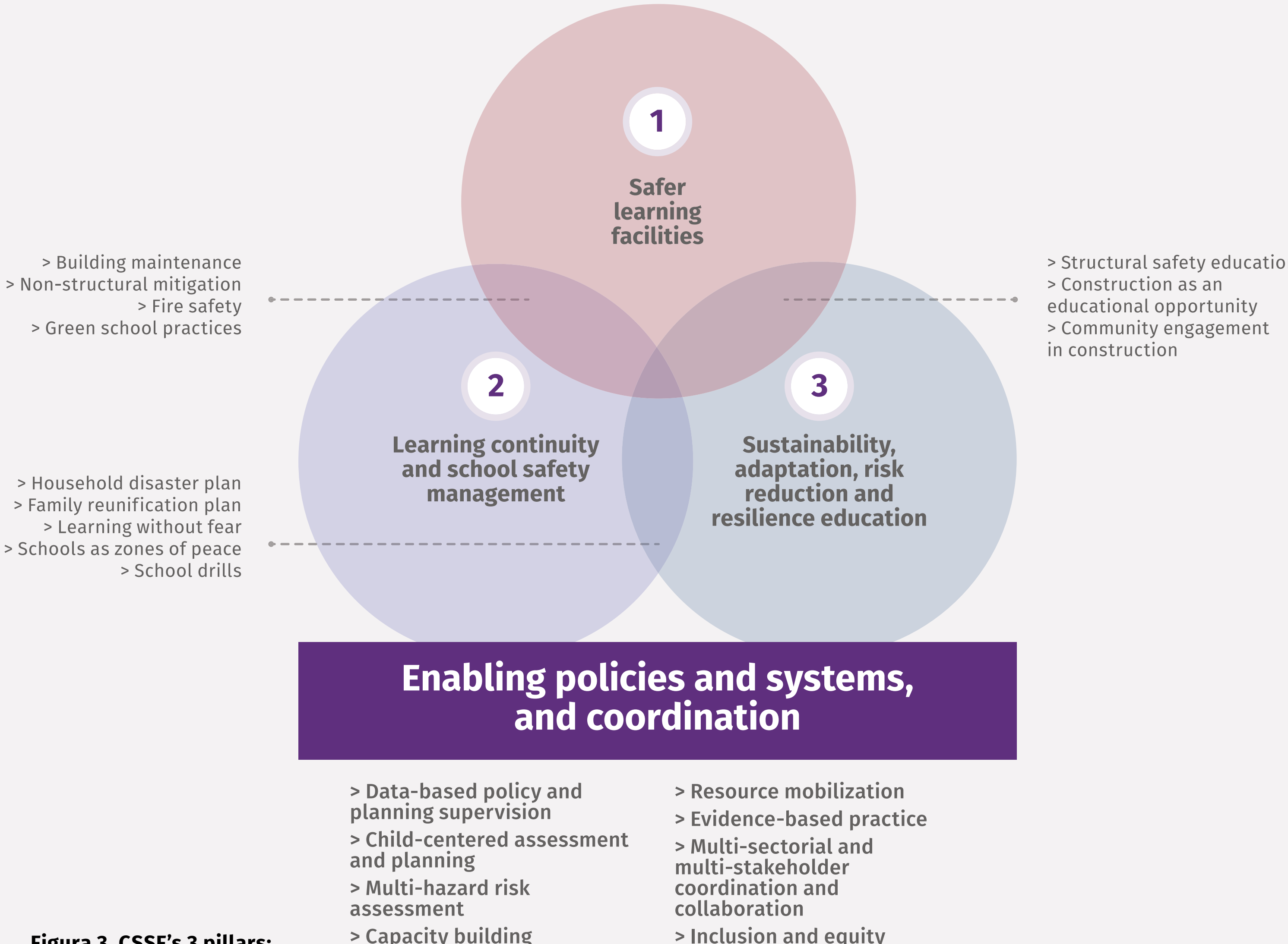


Figura 3. CSSF's 3 pillars: complementarity and intersection (GADRRRES, 2021)

The foundation of the CSSF focuses on increasing resilience in the educational system by establishing and implementing policies and data- and evidence-based planning approaches to reduce risks and increase capacities of the different stakeholders involved, thereby protecting the safety, health and wellbeing of students and the educational community, promoting efficient, equity-centered measures for the continuity of learning, and protecting investments in the education sector. Each pillar includes key stakeholders and actions for meeting the established objectives:

1

Safer learning facilities

Objectives:

- Develop and promote streamlined procedures for the construction of inclusive schools and preschool development centers by governments, donors, NGOs and communities, with the aim of ensuring that "every new school is a safe school."
- Conduct international audits on the construction of new schools to respond to universal education.
- Prepare and promote cost-efficient guidelines to prioritize onsite technical evaluations of learning facilities and establish a timeline for rehabilitation and replacement.
- Encourage national governments to assess the safety of learning facilities and implement an action plan so that all schools will be safe within a given term.
- Prepare and promote guidelines for school non-structural and infrastructural safety measures.

Key actors: Education and planning authorities, architects, engineers, builders, and school community members who make decisions about safe site selection, design, construction and maintenance (including safe and continuous access to the facility).

2

Learning continuity and school safety management

Objectives:

- Prepare and promote guidelines for educational authorities on multiple-hazard risk analysis policies and practices in order to reduce disaster risk at the school. These preparedness measures include standard operative procedures, drills and contingency and educational continuity plans.
- Prepare and promote guidance on disaster risk reduction, preparedness and safety for the family, home, care service providers and parents.
- Develop and promote debate and guidance about the planned, limited use of schools as temporary shelters after a disaster, at the same time protecting continuity of education and investments in educational development.
- Develop and promote responsible management monitoring and assessment tools.
- Promote data collection at school level regarding the impact of disasters, risks and the efficacy of risk reduction activities.

Key actors: Education sector administrators at national and sub-national education authorities, and local school communities who collaborate with their disaster management counterparts in each jurisdiction. At the school level, the staff, students and parents who are all involved in maintaining safe learning environments. They may do this by assessing and reducing structural, non-structural, infrastructural, environmental and social risks, and by developing response capacity and planning to ensure educational continuity.

3

Education for sustainability, adaptation, risk reduction and resilience

Objectives:

- Develop and promote national and local adaptation of consensus-based and actionable key messages for household and community risk reduction.
- Develop and promote a model for comprehensive “scope and progress” for knowledge, skills and competencies in Disaster Risk Reduction.
- Develop and promote knowledge management tools to enable exchange, user classification, reuse, adaptation and impact-testing of educational materials.
- Develop and promote educational materials relevant to the different needs of children of different ages, genders, and disabilities.
- Promote opportunities for global, regional, national, and peer-to-peer experience exchange and evidence-generation.

Key actors: Curriculum and educational materials developers, faculty of pedagogic institutes, teacher trainers, teachers, youth movements, activity leaders, and students, working to develop and strengthen a culture of safety, resilience, and social cohesion.

Although the actions set forth in the CSSF focus mainly on one of the pillars, some of them are also essential to another pillar. For example, although maintaining Safe Learning Facilities is an activity related to infrastructure itself (Pillar 1), execution of these actions depends on school disaster risk management (Pillar 2) both by the government and by the institution. Lack of maintenance or wrong practices could cause failures in infrastructure. Similarly, activities such as the application of a community-based focus for construction or reinforcement of learning facilities provide an opportunity to reinforce disaster risk reduction (DRR) education and transfer techniques and methods for repairing or reinforcing structures, which communities can subsequently apply to their own homes.

School safety and systemic risk

COVID-19 has had direct impact on educational systems in every Latin American and Caribbean country. The region's educational systems have responded to the effects of the pandemic, but are also implementing actions to mitigate potential consequences of the hurricane season, which is more active than usual, and other latent hazards such as geological (earthquakes and tsunamis) and social risks (migration).

Even in absence of a major disaster, the accumulated and coexistent risks may trigger cascading impacts on all sectors (including the education sector) and communities, causing a crisis with devastating impact. Indeed, risks are often created by the very choices made for development (e.g., urbanization and settlement in an area exposed to flooding, expansion of industries in fragile habitats, cutting costs in infrastructure design, or using unsustainable agricultural practices).

Risks generate increasingly complex interactions between natural systems and human, social, political, and economic systems. Systemic approaches are therefore needed to advance toward achieving the 2030 Agenda's objectives and goals. The 2019 edition of the Global Risk Assessment Report states that, by definition, systemic risks are emergent, and not necessarily obvious using contemporary hazard-plus-hazard approaches that address each risk independently (UNDRR, 2019).

Currently, effective management of risks generated or exacerbated by interactions among climate variations, environmental degradation, natural hazards, biological hazards and technological hazards, as well as their potential impacts on persons, communities and ecosystems, requires interdisciplinary and intersectoral cooperation with a systemic approach to risk management in the educational sector, including different actors in society.

Though it may seem challenging to work with multiple disciplines and sectors to report risks in the education sector, COVID-19 has shown that it is critically important to address this challenge in order to manage systemic risks and address the possibility of multiple concurrent risks.

Under this premise, strategies for the education sector cannot be planned and developed individually but must be addressed jointly with other sectoral strategies, taking into account the systemic risks (Figure 4). Looking at planning for education through a lens of systemic risk will help identify risks in the education sector as well as interrelated sectors like infrastructure, water and sanitation, telecommunications, and health, among others. It will also help unlock existing management capacities in all sectors, which, in turn, will enable sustainable development that considers the set of all possible risks.

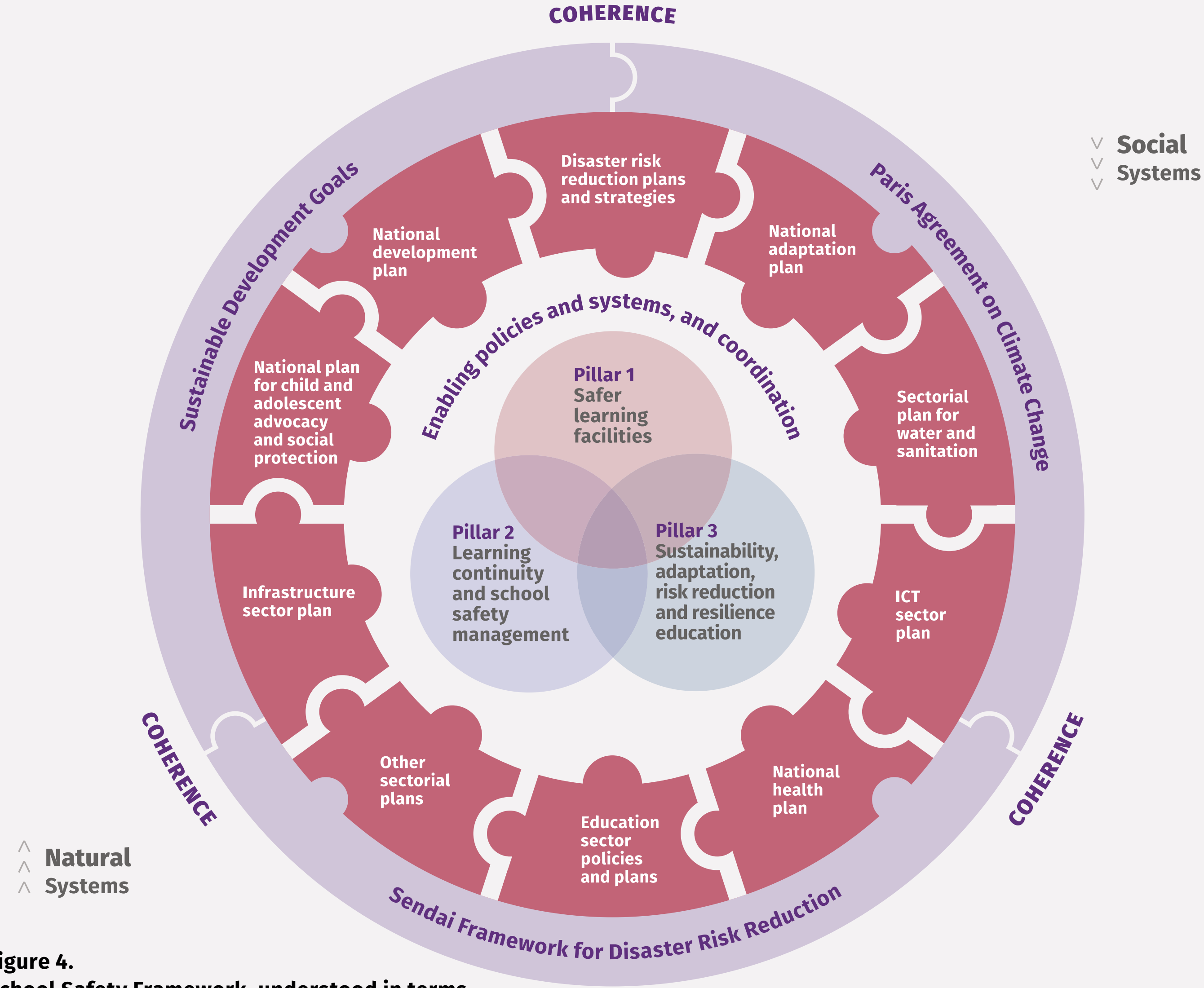


Figure 4.
School Safety Framework, understood in terms of coherence and systemic risk (UNDRR)

Within this context of systemic risk, the education planning performed by national education ministries and implemented by the different regional and local education secretariats is essential and unique. These planning processes should be strengthened to address and manage the new risk dynamics and their respective complex, interconnected factors, as well as the cascading consequences of the impact of hazards in the same sector or in others. Planning should consider multiple-stakeholder dialogue, led by ministries of education and supported by national and local disaster risk management (DRM) institutions, with support from different partners, both national—such as other ministries—and regional or international—such as those belonging to the United Nations, or multilateral development banks. This dialogue should lead to consideration of new institutional arrangements required to expand and improve the capacity to understand and manage systemic risks. The work of ministries in educational planning should incorporate and integrate disaster risk management and system-based approaches both in the design of public education policy and in projects, programs, and investments in other sectors.

In order to address the systemic nature of risk, a systems governance approach should be adopted (Figure 5). This involves reinforcing intersectoral action and relying on national disaster risk management systems, led by DRM institutions, applying multisectoral, interdisciplinary, and transdisciplinary management. Moreover, planning should ensure the creation and strengthening of capacities for this new governance paradigm, which is intended to be inclusive and responsible, with a strong gender transformative approach, meeting the needs of vulnerable groups, and ultimately ensuring that no one is left behind. Similarly, national risk management systems should work with regional and global systems, which can provide different elements conducive to Disaster Risk Reduction. In some cases, standards, methodologies, data, and other elements to design, plan, implement and monitor actions to ensure school safety that are not accessible at the national level can be found at the regional or global level.

Risk is managed by different systems (sectors) that are interconnected

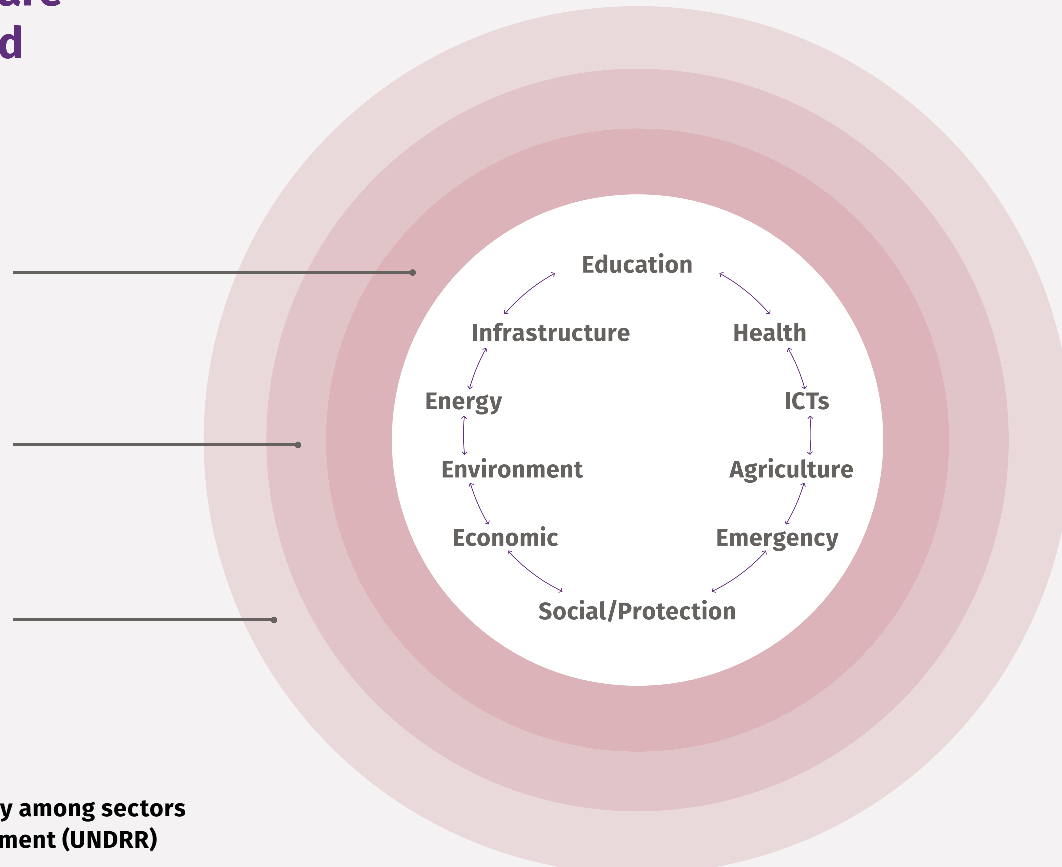


Figure 5. Interconnectivity among sectors for systemic risk management (UNDRR)

Section 2

Safe learning facilities

All infrastructure deteriorates over its useful life. Exposure to natural events accelerates this process, and may even cause injury or death to its occupants, requiring large investments for its rehabilitation. School infrastructure is not exempt from these impacts, and appropriate measures need to be taken to reduce potential risks that may affect both existing and planned facilities. Investments in school infrastructure have evolved with educational system needs, which has required increasing the number of schools to expand coverage to rural areas or the construction and adaptation of spaces in existing facilities to carry out new teaching-learning activities. However, these investments will be at risk if they do not include the technical considerations required to prevent adverse effects in case of an extreme natural event.

It is recommendable to include Sustainable Development Goal 4a in school infrastructure strategic planning: education facilities and learning environments must be built or retrofitted to ensure an inclusive, violence-free, safe environment. If a learning facility does not meet these requirements, there is a risk of impact on educational community members or the education process. Although the concept of a safe environment is quite broad, this guide takes as a reference that the following general criteria should be guaranteed:

- **Hygiene and sanitation:** Learning

facilities should provide conditions to ensure personal hygiene of educational community members, in addition to promoting conditions for appropriate solid waste management.

- **Functionality:** Learning facilities should have sufficient available spaces, as well as complementary infrastructure required for teaching-learning, recreational, and administrative activities for all of the educational community's members.
- **Aesthetics:** Learning facilities should have pleasant spaces, appropriate for encouraging interest and influencing the self-esteem of the educational community.
- **Accessibility:** Learning centers and all their facilities should have routes and accesses to ensure that disabled persons can move autonomously throughout all areas.
- **Social environment:** Schools should have facilities that safeguard school property, protect the educational community in cases of violence, and restrict access to outsiders to prevent theft or damage to functional elements of the institution.

✔ Hygiene and sanitation
✔ Functionality
✔ Aesthetics
✔ Accessibility
✔ Social environment

These concepts are addressed in two books published by CAF: ***Planning Guide for Educational Infrastructure Projects and the Design Guide for Educational Infrastructure Projects***[6], which contain recommendations for developing school infrastructure projects and strategies for designing spaces and equipment (Figure 6).

This guide complements the information for educational infrastructure project development with a description of the criteria and technical processes to ensure minimum safety conditions at learning facilities in case of risks, for new and existing school infrastructure alike.

6 https://scioteca.caf.com/handle/123456789/1649

Figure 6. CAF guides for educational infrastructure projects (CAF)

There is a difference between the technical procedures and criteria applied to new and existing learning centers (Figure 7). The designers, architects and engineers of different specialties are subject to fewer restrictions when designing and building new schools than when assessing or renovating existing schools.

Designing new learning facilities requires consideration of a series of criteria such as projected number of students, construction project location, available space for designing recreational areas, accesses, equipment and furniture to be used, among others. Once the final design has been completed, the investment required for construction can be established quite precisely.

When an intervention involves an existing learning facility, the planning options may be restricted and more complex due to many factors, including

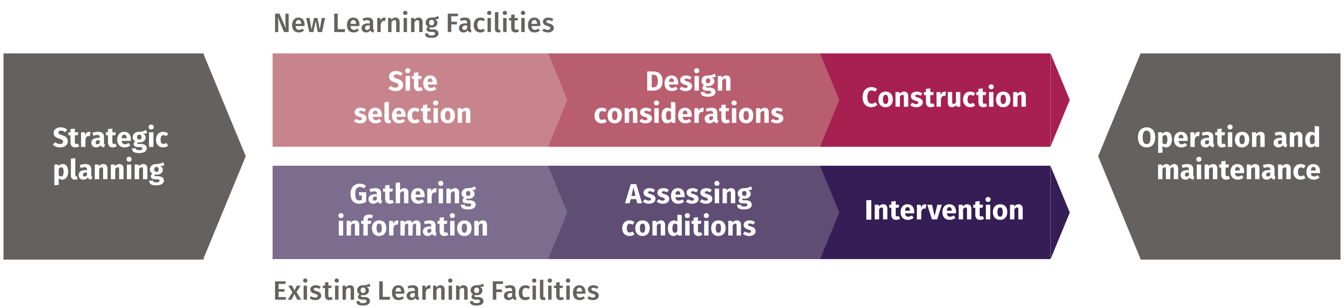


Figure 7. Comparison of processes for building new learning facilities and renovating existing learning facilities (UNDRR/CAF)

lack of space for more buildings, unfavorable conditions for retrofitting existing buildings, restricted access to the learning center, among others. This may require large investments, similar to the amount that would be required to demolish an existing building and erect a new one. Moreover, it is important that once the renovations have been defined, designers should review how those upgrades will affect the rest of the learning facility's components. If structural components will be affected, it must be verified that they will remain stable and able to bear and transmit the new load conditions.

New Learning Facilities

Any new school must be a safe school. If strategic planning has determined that a new learning facility is to be built and its functional requirements have been defined, a series of steps must be followed to ensure its safety.

Designers must consider a series of engineering and architectural criteria to ensure safe design.

Site selection

Site selection is the most important decision in ensuring the safety of a planned learning facility. There may be several options for construction sites for a new building. From the standpoint of risk management, the site with the fewest location-related hazards should be selected, in association with functional criteria such as easy access to the site, neighboring land use types, utility availability, existing vegetation and permits in case trees need to be cut back or removed, among others.

It is recommended that the team in charge of selecting the construction site should include at least one architect and one civil engineer. The architect should have experience in evaluating conditions of functionality and relevance of the land for the use required, while the civil engineer should have experience in protection projects if the site requires them (Figure 8). It is recommendable to use weighted

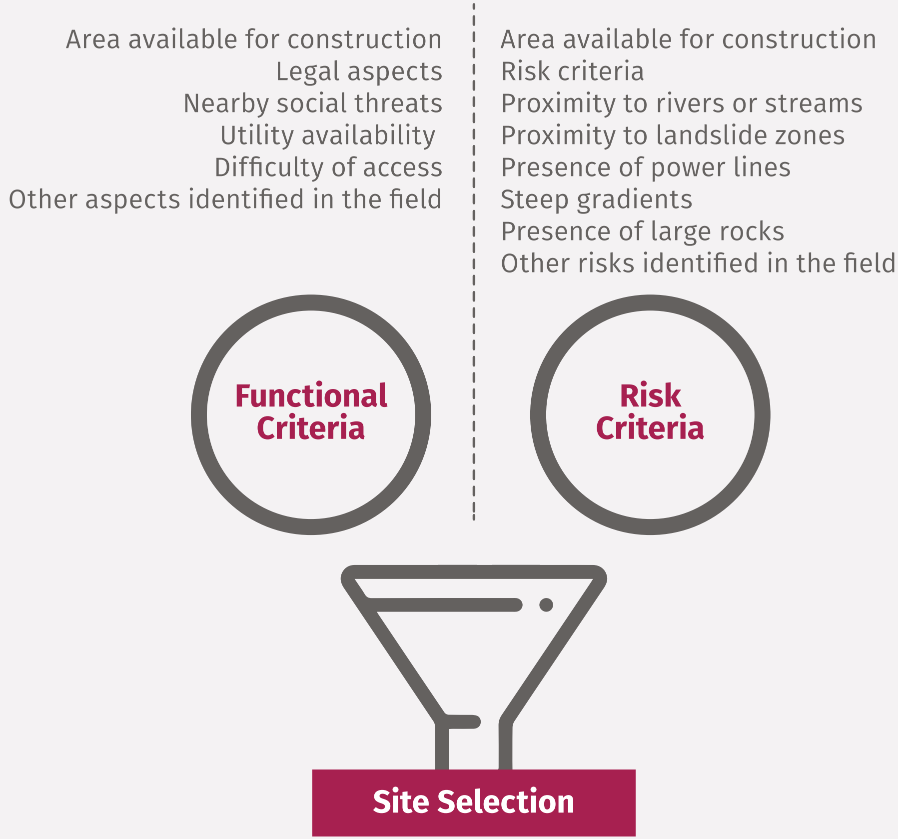


Figure 8. Example of criteria to be considered for site selection (UNDRR/CAF)

decision matrices[7] to compare the different site options, considering the different criteria of the professional assessors.

Hazard maps

Before inspecting possible sites, construction professionals are advised to review the relevant hazard maps, which can be requested from institutions in charge of environmental surveillance in each country. Hazard maps are based on different methodologies, according to the type of phenomenon under study. Depending on the level of technical knowledge of the hazard, the information may be color-coded to indicate areas with no, low, medium or high levels of susceptibility. Graphic information may be accompanied by numerical data indicating expected hazard level ranges, which designers can use as a reference for site selection. Information is available on different scales, providing global information at the country level or local or regional levels. The different kinds of hazard maps may include areas susceptible to flooding, landslides, seismic activity, or volcanic risk, among others (Figure 9).

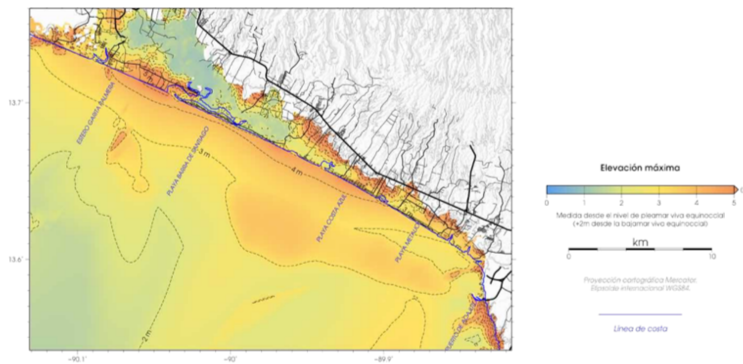


Figure 9. Tsunami inundation hazard map for the western coastal plains and Acajutla, El Salvador. (Ministry of Environment and Natural Resources, El Salvador)

7 A weighted decision matrix is a tool for choosing among different options objectively by means of simple mathematical operations. The decision-making criteria are defined previously along with their respective weights. Everyone involved in the final decision takes part in the creation and completion process.

a) During the dry season

b) During the rainy season

Figure 10. Site conditions at different times of year (UNDRR/CAF)

If detailed information regarding the hazards in the study zone is unavailable, property owners or communities living near the potential sites may be asked about recent events that may have affected the area but are not reflected on hazard maps or susceptibility maps (Figure 10). Their answers may also be useful to corroborate the information provided by hazard maps or to gain a better understanding of other types of problems in the area which are not reflected in the technical documentation.

Design considerations

Once the construction site has been selected, a series of technical studies are needed so professionals can design the project.

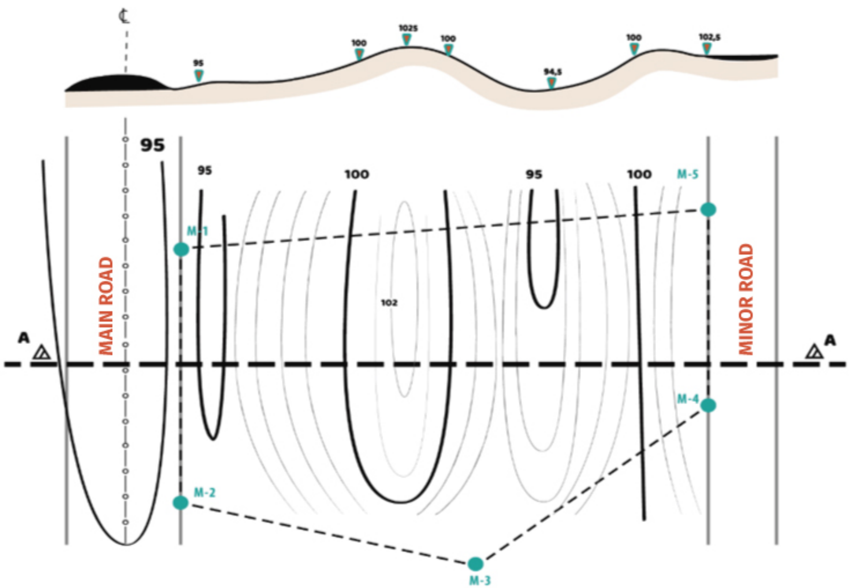


Figure 11. Topographic information (UNDRR/CAF)

Site topography

To gather detailed information about the site conditions, a complete topographic study is required, including georeferenced coordinates of property markers or survey pins, distances and directions of boundaries, adjoining properties and access roads. A contour survey is also required to establish contour lines and elevations of interest on an appropriate scale (Figure 11).

Architectural design

Once site topography has been defined, the architect can plan construction layout. No construction should be projected on site areas that may be susceptible to flooding or landslides. It is recommendable to create site terrain profiles to visualize gradients and ascertain whether stormwater channels or protection structures are required. If they are—and to avoid the need to build excessively large protection

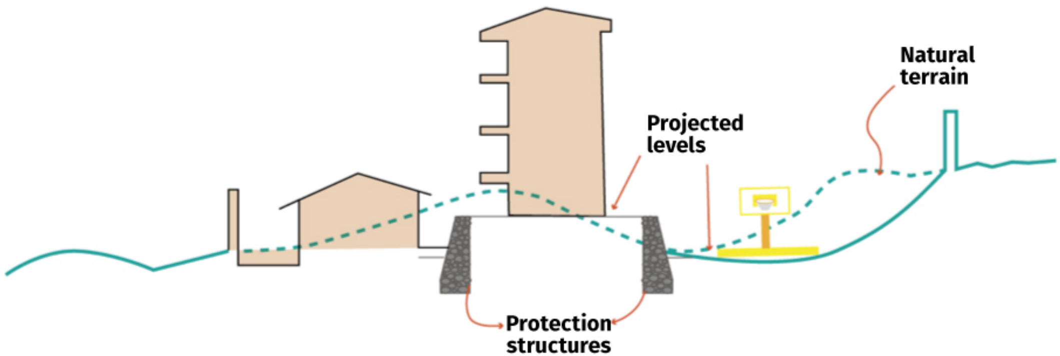


Figure 12. Terrain profile and creation of terraces on the site (UNDRR/CAF)

structures—the architect may suggest forming terraces for the projected infrastructure (Figure 12).

Projected building dimensions are based on the minimum areas suggested for the learning facility spaces (classrooms, administrative area, sanitary services, etc.).

It is recommended that the shape of both floor plans and elevations should be regular, especially in seismic zones (Figure 13). In addition, structural components should be distributed evenly to prevent inadequate behavior during earthquakes. Rectangular-shaped floor plans are the most frequently used. Care should be taken to avoid excessively long buildings, because seismic waves may differ over the extension. As shown in Figure 13, one of the main recommendations is to use seismic joints so that structures behave as short lengths. (The designer should calculate the gap.)

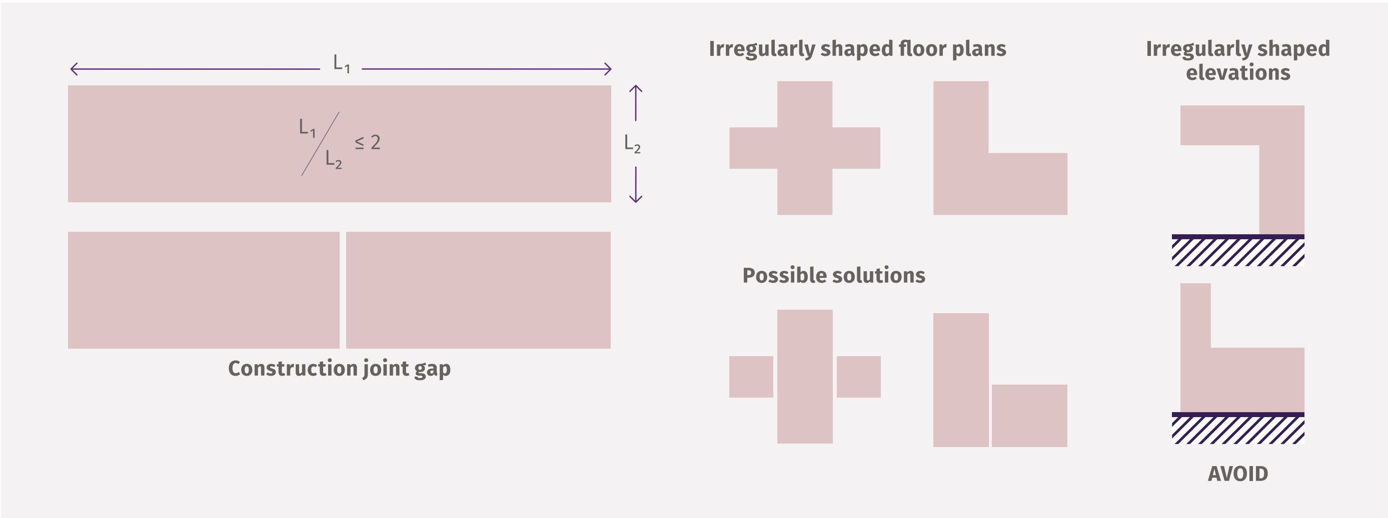


Figure 13. Different building shapes and solutions (UNDRR/CAF)

Ground investigation

Once the main building locations have been defined, a ground investigation must be performed to provide information on site subsoil conditions. The structural designer needs this information because the foundation type and dimensions will be based on site geotechnical information (Figure 14).

Ground investigations provide information on ground mechanical properties, estimated thicknesses of the organic layer, moisture, friction coefficient, and other parameters needed to design any retaining structures needed, make suggestions for stabilizing inadequate ground, and estimate terracing costs (Figure 15).

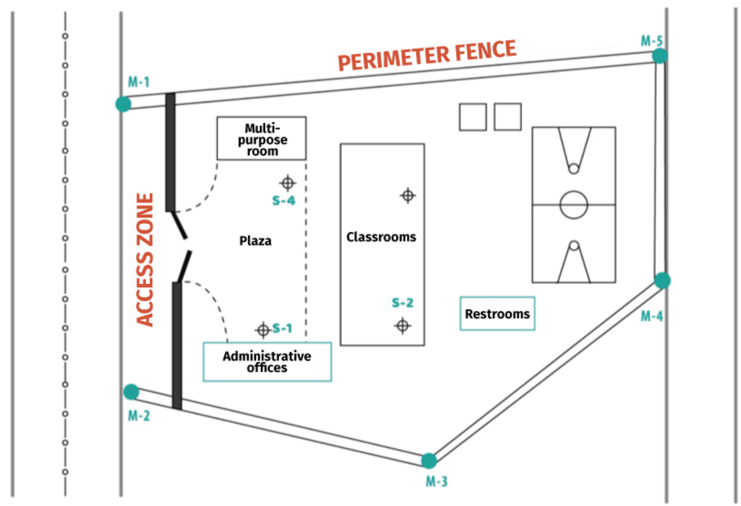


Figure 14. Project construction layout showing the ground investigation required (UNDRR/CAF)

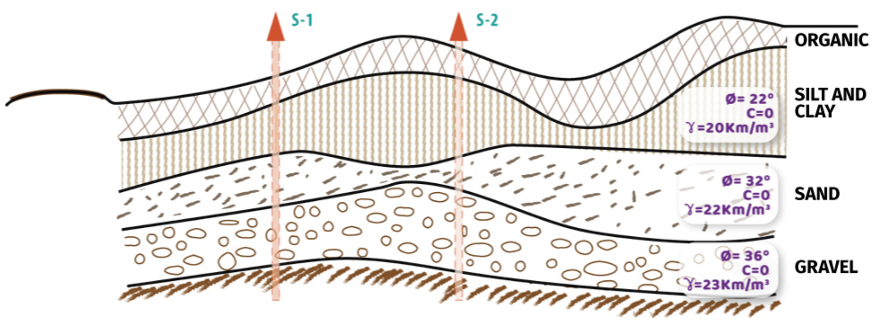


Figure 15. Information provided by ground investigations (UNDRR/CAF)

Structural design

The purpose of structural design is to guarantee structural stability, resistance, and rigidity. Based on the size of the spaces, the structural designer will decide in the architectural proposal which components are to be used for the established purposes, and calculate and define the size of the resistant sections and their respective reinforcement.

Calculations are based the gravity loads to which the structure will be subjected, combined with possible effects that may occur due to lateral loads throughout its useful life due to events such as earthquakes or winds.

Gravity loads are divided into two main groups: dead loads due to the weight of building components and live loads, which are variable estimated loads that the structure will have to withstand constantly due to use of the building.

The values of possible lateral loads caused by earthquakes or wind are available in construction code design standards, and usually represent the maximum acceleration values expected at the construction site in case of earthquakes, or the maximum pressure or suction expected on the surfaces of the structure as a result of wind (Figure 16).

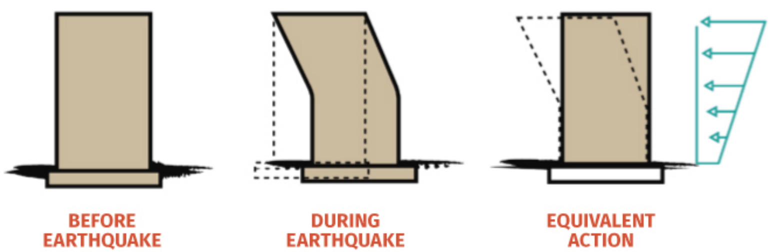


Figura 16. Basic criteria used in simplified structure design for (a) earthquakes and (b) wind (UNDRR/CAF)

In addition to designing the buildings, the structural designer must size and calculate the reinforcement required for all protection structures needed at the learning facility (Figure 17).

The ground investigation will define the necessary depth of building foundations. Depending on the mechanical characteristics of the different strata, the ground investigation may suggest the use of deep foundations, reaching strata that are sufficiently resistant to transmit and support the building's load conditions (Figure 18).

Non-structural components

Non-structural components are any components that the structural designer does not deem necessary for supporting loads during the building's useful life. Although they do not determine the structure's stability, resistance or rigidity, their interaction

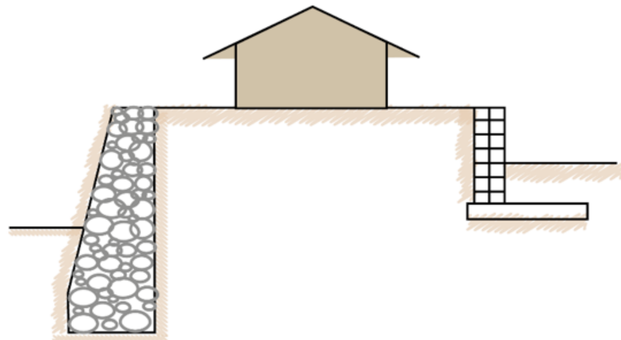


Figure 17. Retaining structures (UNDRR/CAF)

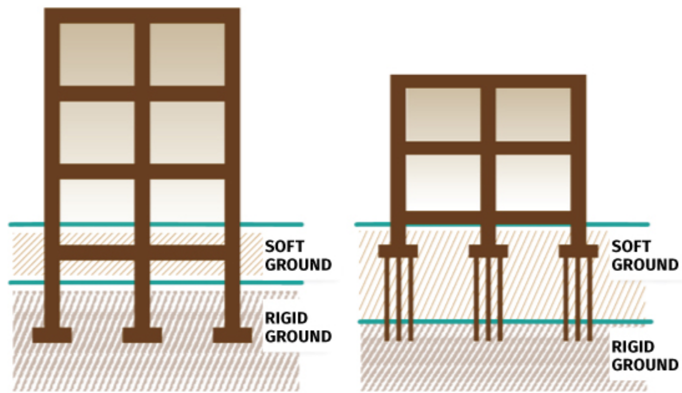


Figure 18. (a) Shallow foundations and (b) deep foundations (UNDRR/CAF)

with the structural components, or the lack of appropriate attachment to or separation from them, may signify some risk to building occupants (Figure 19).

The structural designer should pay special attention to calculating structure rigidity, estimating maximum lateral deformations that could occur during earthquakes or winds. This is useful for defining the separation between structural and non-structural components such as infill walls, preventing them from making contact during possible seismic events (Figure 20).

Figure 19. (a) General view of non-structural components,[8] (b) ceiling damage[9].

Figure 20. Damage to structural and non-structural components as a result of their interaction during an earthquake (Sanchez, J. 2019)

8 © tecnolite.lat

9 © Gilberto Sierra, https://www.laprensa.hn

Functional components

Functional components are all those that enable learning activities to take place in the facility.

Learning facilities must have the necessary installations with adequate hygienic conditions to ensure health of all members.

The learning facility site must have access to potable water and washbasins in good condition. There must be separate sanitary installations for girls and boys, both of which must be accessible to people with disabilities.

The infrastructure must be accessible, such that any disabled person can move about autonomously and carry out their activities in any building. If buildings have different levels, there must be ramps to ensure mobility for disabled persons and rails to provide protection. Sanitary installations must have appropriate space and supporting structures to ensure accessibility.

Equipment consists of any items used for teaching-learning activities at the learning facility, including recreational installations, laboratories or sports installations for integral student development.

Site boundaries must prevent outsiders from entering the learning facility and potentially harming occupants or infrastructure, or stealing equipment. Likewise, areas containing equipment, such as laboratories or computer labs, must be protected by secure doors and windows. In extreme cases, the need should be considered for ceilings to be adapted to prevent entry through the roof. Sufficient space must be ensured for school entry and exit areas, including a rigorous system to regulate the entry and exit of outsiders.

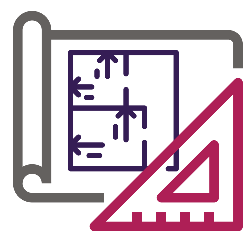
Adequate signage should be in place to enable users to take due precautions in case of an adverse event. Signage must include a complete map of the learning facility layout, showing people their location within the facility, assembly points, safe shelter zones, and possible evacuation routes.

The potable water supply network and storage system at the learning facility must be appropriately designed. Special care must be taken regarding terrain levels when defining piping layouts in order to avoid any exposed piping or piping too near the surface that could lead to fissures and leaks. Electricity and telecommunications lines must be considered during the design phase, based on the learning facility's planned technological resources (lighting, ventilation, computer centers, kitchen equipment, etc.).

Floor plans and technical specifications
Project designers should prepare calculation reports recording the parameters used in designing the infrastructure. All information shall be shown graphically on the floor plans and include all details of the infrastructure to be built (architectural, structural, electrical, hydraulic, and telecommunications plans, protection structures, etc.). The reports should also include all technical specifications of the materials to be used and the terms of reference that ensure construction quality.

The Ministry of Education or school infrastructure management institution in each country should be responsible for safeguarding this information. In case of any damage, the information may be used to perform a more detailed review of the facility.

Construction
Once the technical information has been defined for a new learning facility, the building cost can be estimated. It is advisable that the estimate include the cost for supervising execution of the work. Supervision will ensure that the processes are carried out in accordance with the plans and technical specifications. However, depending on the size of the project, supervision may be performed by the school's infrastructure management technical team.



Existing Learning Facilities

Every building has a useful life, which may be extended if each component receives the appropriate periodical maintenance. Maintenance periodicity depends on the type and quality of construction materials used since each one deteriorates at a different rate, which may be accelerated by conditions of use, environmental conditions, or adverse events such as natural phenomena affecting the infrastructure.

Allocation of financial resources to improve or maintain optimal conditions at existing learning centers is the main source of concern for fund administrators at the school infrastructure management entities. They need to find a way to distribute resources efficiently to cover as many learning facilities as possible.

Maintenance is defined as the set of actions performed on the **different components** of a learning facility to maintain functionality over time and aesthetically pleasing environments, including any interventions and modifications required to correct any deterioration. Learning facility maintenance includes preventive and corrective actions.

Preventive maintenance needs to be scheduled periodically and can usually be performed by learning facility personnel, sometimes with participation of students and the educational community. Investments in preventive maintenance can be estimated based on a detailed inventory of the learning facility and the cost of labor and necessary personnel responsible for performing maintenance tasks at the facility.

Corrective maintenance is performed when any damage or deficiency is identified at the facility, taking into account that if an adverse event were to occur, the extent or occurrence of damage could affect educational community members. Although some types of damage can be detected visually, other deficiencies in infrastructure can only be identified by engineers or qualified personnel. In most cases, corrective maintenance tasks require experienced personnel or specialized labor.

The possible effects caused by different hazards on a learning facility can deteriorate its condition it in relatively short time periods (e.g., an earthquake can cause deterioration in seconds, a hurricane or storm, in hours or days).

This guide essentially focuses on corrective risk management, which is directly related to making investments to reduce existing risk conditions (Figure 21).

For adequate corrective risk management at existing learning facilities, it is recommendable that the following input should be available to school infrastructure management institutions:

Gathering information

Learning facility georeferencing and inventory

It is recommendable for school infrastructure management institutions to have a geographic information system showing all learning facilities in the country or region (Figure 22).

Prospective Management

> Evaluation of future risks

> Policies and Planning

Corrective Management

> Evaluation of present risk

> Interventions on infrastructure

Compensatory Management

> Disaster preparedness

> Response plans

Figure 21. Risk management modes (UNDRR/CAF)

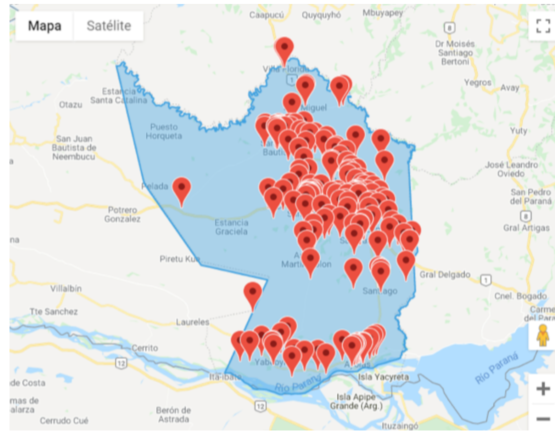


Figure 22. Map of learning facilities, Misiones Department, Paraguay[10]

10 http://mapaescolar.mec.gov.py/mapa_escolar/maps/index

Ideally, in addition to educational statistics, each georeferenced point representing a learning facility should include quantitative details of its infrastructure. To provide input to the system, inspections need to be conducted at each site using forms or checklists to gather information. During the pandemic and with the widespread use of information technologies, some countries such as Ecuador sent forms by email or electronic devices to the learning facility directors or managers. The completed forms could be used to define the inventory of infrastructure.

Other countries developed complementary IT tools to speed up the collection of required information to verify needs regarding maintenance, repair or replacement of components, or in extreme cases, to report that a school has been affected by a natural or social event. The platform SABER (System for Basic Administration of Education and its Resources, according to its acronym in Spanish) was launched in 2021 with the aim of creating a complete, automated register of students through their ID documents and information from educational facilities.

It is worth noting that georeferencing schools facilitates information monitoring tasks at all levels, and may become a tool for defining resource prioritization strategies.

Evaluation of existing conditions

Technical inspections

After an adverse event, technical inspections are conducted at learning facilities to determine which components have been damaged. Although it is always recommendable to apply a reactive approach and assess the condition of a learning facility after an adverse event, special attention should be given to creating conditions for performing corrective risk management.

Inspections during the COVID-19 pandemic focused on checking the conditions of deterioration and compliance with biosafety measures to enable the educational community to return to the schools. Biosafety conditions included access to potable water, storage systems, washbasins, and toilets, among others.

Corrective risk management technical inspections ensure the learning facility's safety level for users. Technical inspections can be planned by learning facility infrastructure managers, not only conducted after an adverse event. Thus, the georeferenced inventory, in addition to providing a quantitative description of the learning facility's existing infrastructure, should include qualitative technical information that will make it possible to define the safety level for occupants.

During a technical inspection, it is recommendable that learning facility construction plans should be available to determine whether there have been any additional construction or modifications. Such modifications are often performed by local governments, school center authorities, community members, or NGOs, among others, to resolve needs such as creating new rooms, recreational areas, or kitchen spaces, removing walls or partitions to enlarge a space, changing deteriorated non-structural components, waterproofing green spaces, or building access ramps for disabled persons, among others. If such information is not available, learning facility personnel who know how the infrastructure has evolved over time should be present during the inspection to provide information.

It is essential for learning facility inspections to assess each learning facility component and record its vulnerability to different hazards on the checklist (Figure 23).

It is suggested that surrounding conditions should be assessed, initially reviewing all components outside the learning facility that could pose a risk to occupants or cause a restriction in the case of an evacuation. For example, identify branches that could fall or contact power lines, lack of signage at the access road or presence of a high-traffic access road, etc. Also, check for the presence and condition of perimeter walls or fences that protect the facility and prevent outsiders from entering. The inspection should also include the condition of playgrounds, sports facilities, recreational facilities or living areas to ensure they do not pose any hazard to occupants (cracked floors, unmarked floor holes, fragile branches, or damaged benches, among others).

It is recommendable that engineers or qualified personnel should inspect structural components to determine whether there is any damage, by checking for cracks or different settling rates. All retaining structures should also be inspected.

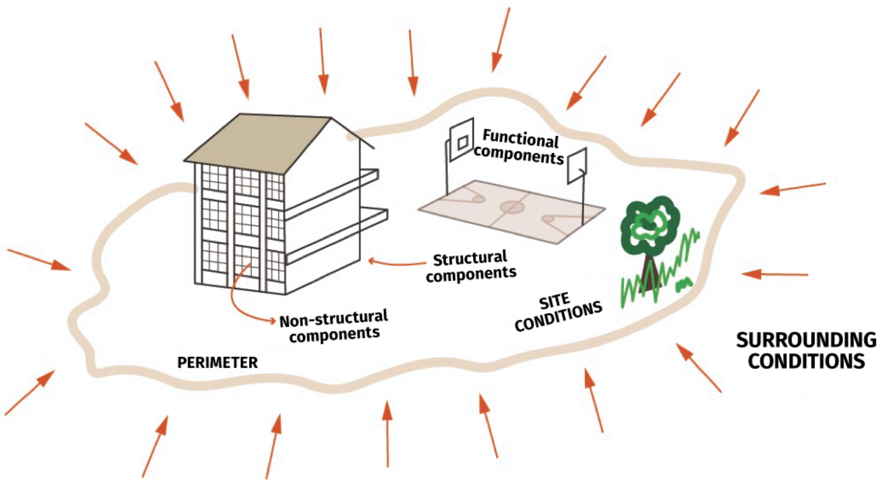


Figura 23. Components to be evaluated during inspections (UNDRR/CAF)

The inspection of non-structural components of the building should consider any items which, even though they do not bear loads, could signify a risk to occupants in case of any damage, or which could be replaced due to aesthetic criteria, including floors, ceilings, doors, windows, and roofs, among others.

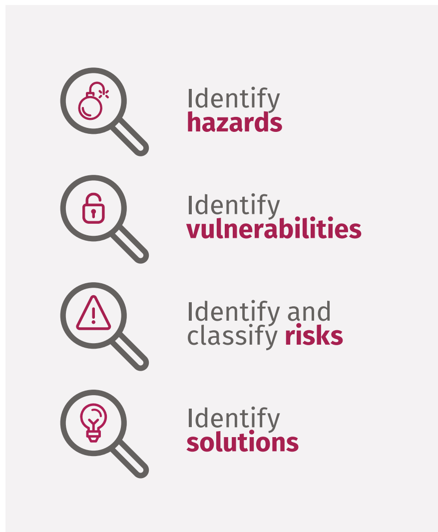
Functional component inspection focuses on checking that their operational condition enables activities to proceed normally at the learning facility. It is suggested that assessment should be conducted on the condition of teaching equipment, sports facilities, supply and sanitation systems, electrical and telecommunications systems, access ramps, railings, and access zones, among others.

To complete the information on a learning facility, a history of events that have affected installations with the impacts of each event on the different components is needed. This historical record will provide better understanding of the events that caused damage or disruption of school services. If a log or record of damage is not available, it is recommended to consult local authorities, directors, teachers or maintenance staff.

Interventions

Different intervention strategies can be defined to reduce adverse effects on the many components of a learning facility by using the information from the technical inspection and evaluating the possible hazards that could affect the sites. To do so, it is recommendable that the risks at learning centers should be evaluated by engineering specialists, who can establish intervention strategies in collaboration with school infrastructure managers.

The **risk assessment process** is summarized in five basic stages:



- **Identify hazards.** Identify potential hazards that may affect learning facilities. This information can be obtained from georeferenced digital maps in combination with the georeferenced system of learning facilities in a country or specific region. If this information is unavailable, the records of effects on learning facilities during previous events or other reliable information can be used.
- **Identify vulnerabilities.** Use the information gathered at technical inspections to identify the different infrastructure components that may be damaged, or that may pose a risk to the educational community in case of an adverse event, potentially affecting the continuity of school activity.
- **Identify and classify risks.** Generate the potential scenarios for each hazard or combination of

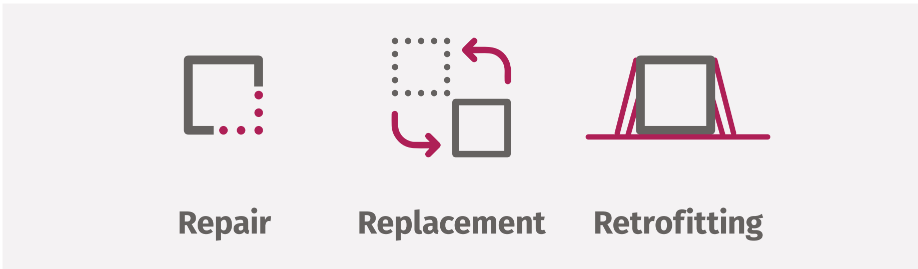
hazards and their interaction with the vulnerable components that could be impacted. A scenario is a representation of both those factors (hazards and vulnerability) in a given region and time. Symbols or color codes may be used to visualize potential negative effects that would occur in each scenario and to identify the learning facilities or zones at greatest risk. Such information may be submitted to learning facility directors or managers.

- **Identify solutions.** Possible solutions to reduce each possible expected impact can be discussed with specialists in different engineering disciplines, defining the actions and responsibilities that could be performed by trained personnel or educational community members. Some actions may focus on developing a culture of prevention among educational community members, e.g., drills, reforestation programs, clean-up efforts, among others. Some actions will have to be carried out by qualified or at least experienced personnel, e.g., welding, changing roofs, and repairing doors, among others. In extreme cases, the interpretation of the results may suggest the need for specialists to conduct more specific studies to determine the interventions required.

The necessary intervention tasks should be broken down and classified by engineering professionals in order to prevent empirical solutions from creating other kinds of vulnerabilities.

There are three **basic intervention processes:**

- **Repair** consists of recovering the strength and safety levels of affected components. Slightly damaged items may be repaired, e.g., cracked roofing that can be



sealed with putty, adhesive or sealer (depending on the type of roof and relevant procedure).

- **Replacement** consists of replacing an item or part of a component because the damage is too extensive to repair. Damage level does not compromise building stability, e.g., broken o fractured roofing that needs to be partially or totally replaced.

- **Retrofitting** consists of increasing the capacity of a structure or one of its components because the level of damage or its location places building stability at risk, e.g., installing new structural components to limit movement of a flexible structure.

Once the interventions to be performed have been identified and classified, a quote must be obtained for each one in order to estimate the investment required, including materials, labor (possibly not required if educational community members can do the job), and other costs like specialist contractors. Some interventions do not require high levels of investment and some may be done with local labor or participation of community members. However, others may require greater investments, possibly involving new structures to mitigate the negative effects of expected in risk scenarios (gutters or retaining walls, among others).

It is worth noting that if the impacts on infrastructure or the interventions to be performed prevent the continuity of learning activities, the possibility should be considered of finding alternative temporary spaces which have previously been identified as safe and which, even if they are not large enough to accommodate all students, can be used in combination with alternative teaching methodologies (video lessons, worksheets to complete at home, or educational TV programs, among others, as was done in many countries worldwide during the COVID-19 lockdown).

Community-based risk management

Preparing a risk management plan for all learning facilities in a country or region requires time and resources, so educational authorities have created or adapted guides to help educational community members to conduct their own evaluation (e.g., **Guide for risk management at learning institutions, Guide for regular basic education teachers** https://www.eird.org/cd/herramientas-recursos-educacion-gestion-riesgo/pdf/spa/doc17358/doc17358.pdf).

Community-based risk management promotes community participation, including community assessment of hazards, vulnerabilities and capacities, as well as community participation in planning, application, monitoring, and assessment of local actions aimed at reducing disaster risks. For example, the school risk map prepared by the community may show areas where branches could fall from trees due to strong winds, areas that usually flood during the rainy season, or heavy items that could fall from shelves during an earthquake, among others. Similarly, the floor plan should be used to locate safe sites that could be used as assembly points in case of emergencies, define escape routes, and mark the location of fire extinguishers, first aid kits and other tools that may be useful in case of emergency. To ensure that the information on the floor plans is useful in case of emergency, the information must be appropriately signposted on the infrastructure, and visible to all community members. To ensure the information is appropriate, drills need to be held, for which the role of each educational community member is defined in operational manuals. Participation of teachers, students, administrative staff, parents and the community in general is essential in order to achieve greater visualization of the risk perception at the learning facility. These activities must be accompanied by the authorities and school infrastructure management specialists. Such activity should be reviewed annually, updating the information according to lessons learned for each component.

Section 3

Tools for evaluating school infrastructure safety

Some countries with limited financial resources cannot invest in building new learning facilities without first considering the maintenance and improvement needed on existing facilities. School infrastructure management institutions are responsible for gathering essential information in the field in order to establish the vulnerability level of existing facilities in case of adverse events. This information is vital for defining risk levels at learning facilities in a region or country, which can be used to define strategies for prioritizing investments to reduce that risk, before making other kinds of investment in other lines of work. It is important for infrastructure management institutions to have tools to facilitate the task of collecting information.

Assessment instruments

Technical instruments for gathering information in the field—usually forms or checklists—must be designed to gather information that will enable infrastructure conditions to be defined clearly, both for maintenance purposes and to establish the vulnerability level of each component. The checklists or forms should consist of a series of items or questions, free from any subjectivity that could confuse field inspectors or may be difficult to process. They should also be adaptable to all possible field conditions.

These assessment instruments should also be designed with a multi-hazard approach to avoid erroneous conclusions from being drawn regarding interventions to be performed at learning facilities and optimize the resources involved in conducting field inspections for each type of hazard. If inspections only focus on a single situation, they might underestimate infrastructure capacity needs in the face of other less frequent scenarios that could affect the learning community if they were to occur (Figure 24), including cascading or accumulative events. The checklists should also include items for defining social hazards (conflict, violence, etc.) that could affect learning facility assets or place educational community members at risk. This information enables the definition of interventions in infrastructure that could reduce the impact of such situations (construction or improvement of perimeter fences, installing window protection, replacing access doors, and installing cameras, among others).

Some of these instruments can be designed so that educational

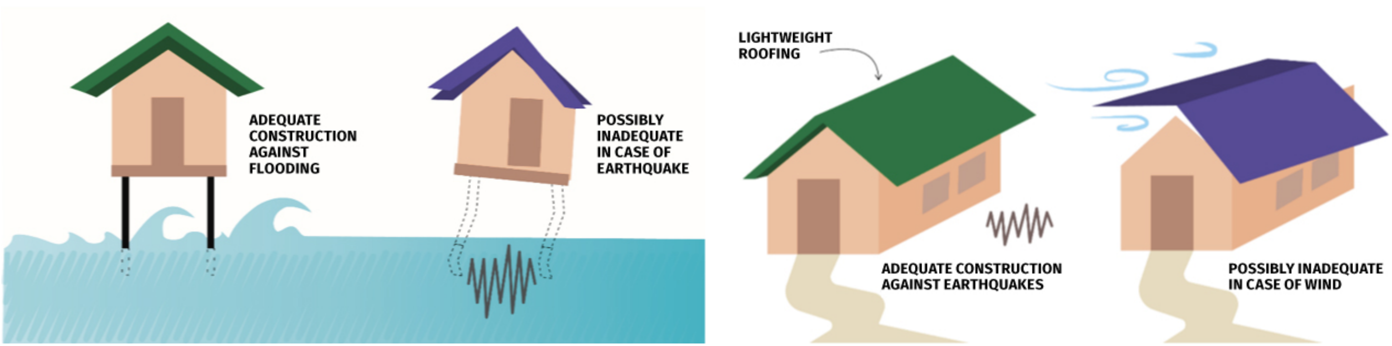


Figure 24. Problems in infrastructure as a result of lack of multi-hazard criteria (UNDRR/CAF)

community members can self-evaluate the infrastructure. In this case, they should take into account that the personnel performing the inspection is not qualified to analyze and determine structural reinforcement strategies. However, they can use them to collect information about the basic condition of facilities, such as past impacts that damaged infrastructure or disrupted learning center activities, faults in components such as roofing due to strong winds, maximum water levels on walls or other reference objects in case of rain or flooding, or to define needs for improving teaching-learning conditions. These self-assessment methodologies are very useful for collecting information that can be used to define more in-depth school inspection strategies, but should not be used as the only source for determining whether or not the school structure is safe.

Assessment methodologies

An assessment methodology is defined as a series of rational procedures used to achieve a given objective. For evaluation instruments to be effective, they must be based on clear objectives or goals. While each country may generate its own checklist for collecting information during inspections, in many cases these instruments are designed as a resource for gathering statistical information but are insufficient for defining levels of vulnerability. This is because these checklists or forms are not developed based on a risk-management strategy or methodology, and serve to cover a specific need like the identification of needs.

Two of the main initiatives related to educational infrastructure assessment methodologies developed by United Nations agencies are presented below.

School Safety Index

UNICEF developed a method to assess physical and social vulnerabilities and exposure at learning facilities, known as the School Safety Index, within the framework of the implementation of the Regional Project “Strengthening the role of the education communities in preparedness and response capacities to ensure children’s rights in emergency situations in South America” with support from the European Commission’s Department of Humanitarian Aid and Civil Protection through action plan DIPECHO 2011-2012 for South America.

The School Safety Index concept was based on the “Hospital Safety Index” implemented by PAHO/WHO and on previous regional initiatives such as (a) the “Safety Index for Educational Centers” (ISCE, by its acronym in Spanish) prepared by the Government of

Guatemala through the Risk Reduction Commission of the National Roundtable for Dialogue on Disaster Risk Reduction Management, and (b) the Unified Checklist for Comprehensive Risk Management at Educational Institutions (Ficha Unificada para la Gestión Integral del Riesgo en Instituciones Educativas) developed by UNESCO through its representation in Peru.

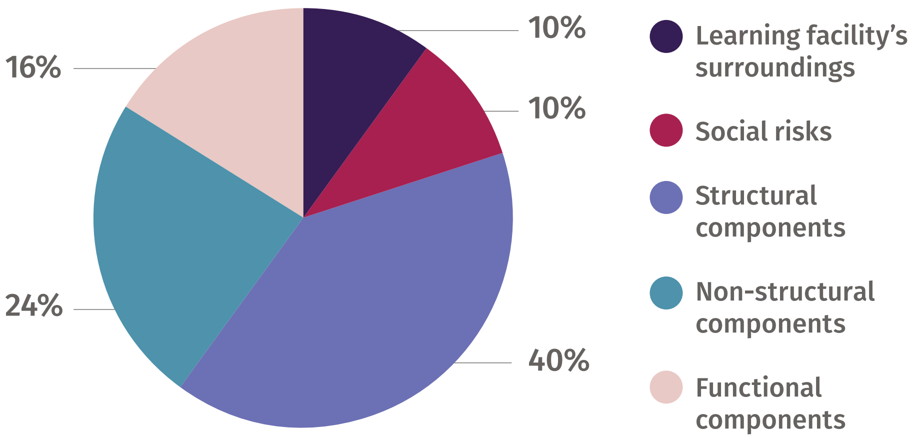
The School Safety Index intends to:

1. Establish the **minimum components required** for determining safety conditions at a learning facility.
2. **Weigh** the minimum components required for establishing safety conditions at a learning facility.
3. Define the **processes and recommendations** for implementing the School Safety Index.
4. Develop the instruments needed to **assess safety conditions** at learning facilities (checklists).
5. Establish the **conceptual references needed** for implementation.
6. Propose processes for **systematization, analysis and conclusions,** and for presenting results.

For implementation, the School Safety Index divides the learning facility into five components, as shown in Figure 25:

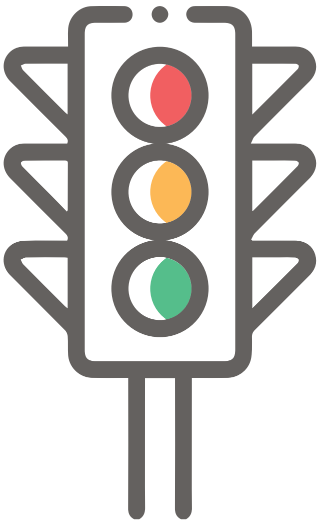
Figure 25. Learning facility components according to the School Safety Index (UNICEF)

The School Safety Index is calculated using a weighted variables analysis, in which each component described is weighted according to its relevance in the risk management scheme. Each component is composed of a series of variables or items and assigned relative weight defining its importance with relation to the others. With relative weights assigned to each variable, the global score is found by adding the results obtained for each variable multiplied by the weight assigned to each component (Figure 26).



The School Safety Index is normalized in a range of 0 to 100, and based on the results of the inspection, it provides a very general indication of the measures to be taken at the learning facility, as shown in Table 2. Note that although the score provides a general indication of the measures to be taken, it does not specifically describe the interventions required for each learning facility.

Figure 26. Weighting of School Safety Index components (UNICEF)



Range	Range name	Measures to be taken
0 - 33	Low safety	Urgent measures required immediately because facility safety levels are insufficient to protect the lives of users during and after the impact of a damaging event.
34 - 66	Medium safety	Measures required in the short term because facility safety levels may potentially place at risk both users and facility operations during and after the impact of a damaging event.
64 - 100	High safety	Although the facility will probably safeguard users and probably continue operating even during and after the impact of a damaging event, it is recommended to continue with actions intended to safeguard the physical integrity of the facility, improve capacities and preserve or improve available resources.

Table 2. Safety ranges established for values determined during inspections (UNICEF)

Some recommendations from the School Safety Index Implementation Guide are provided below:

1. **Project coordination.** It is suggested that the country or region's school infrastructure management institution should coordinate assessments with the different actors related to learning facilities, e.g., municipal authorities, local first-respondent institutions such as firefighters, local representatives of the civil protection system, educational community members, etc. Project coordinators should arrange training sessions for personnel in the use of tools to achieve greater effectivity, objectivity, and relevance in experience-based assessment processes. The results of each assessment should be discussed with members of the learning facility's office of the director or principal and with local competent authorities of both the educational sector and those sectors involved in the learning facility's activities and community.

- ✔ Project coordination
- ✔ Selection and profile of the assessment team
- ✔ Tools required for implementation
- ✔ Role of learning center managers
- ✔ Preliminary information
- ✔ Recommendations during inspection
- ✔ Assessment systematization, analysis, and conclusions.

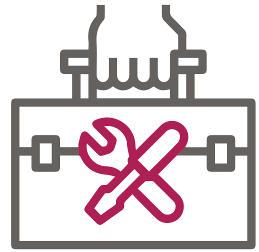
2. **Selection and profile of the assessment team.** The team should be multidisciplinary, preferably including persons with experience in risk reduction. The size and number of teams may vary according to the complexity of the learning facilities. It is recommendable to involve professional associations, academic associations and universities in the assessment process. The team should preferably consist of the following:
   - Civil engineers specializing in structural analysis
   - Architects with experience in learning facility design/construction/supervision
   - Specialists in educational equipment
   - Specialists in the educational sector (teaching area)
   - Specialists in risk management, planning, administration and

logistics

- Specialists in issues related to social risk (sociologists, psychologists, etc.)
- Others (safety consultants, municipal inspectors, etc.).

3. **Assessment team organization.** The assessment team should have a coordinator in charge of liaising with learning facility authorities and other specialists. The coordinator will also be responsible for delivering to school authorities the report containing the proposals for intervention. The coordinator must have experience in disaster risk management and have been trained in using the School Safety Index. The coordinator is supported by the team of assessors, organized into three groups: structural, non-structural and functional. The number of assessors will depend on the size and complexity of the learning facility. Assessors will inspect the five components and support the coordinator in the final recommendations. Because the assessment involves visual inspection, it is important that the coordinator and assessors should be highly qualified, experienced professionals.

4. **Tools required for implementation.** It is recommended that the assessment team should have the following tools:
   - School Safety Index Implementation Guide
   - Map of the area where the learning center is located
   - Previous technical reports and hazard maps
   - Learning facility's floor plans (if available)
   - Data collection instrument



   - Notebook; pen or pencil
   - Radio or cell phone
   - Directory of key actors involved in the assessment process
   - Flashlight with charged batteries
   - Camera and audio recorder
   - Hand tools (tape measures, chisels, etc.)
   - Calculator
   - Geo-referencing equipment (GPS—Global Positioning System)
   - Clipboard, legal size
   - Plastic bag to protect stationery

5. **Role of learning center managers.** The Director's office staff or learning center managers should designate technical, administrative, and maintenance personnel to

offer help during the assessment process by providing any relevant documents (floor plans, protocols, plans, directories, etc.). Any information that might be relevant to the assessment should not be withheld. It is also recommended that the authorities inform parents, guardians, and students regarding the assessment to be performed to avoid creating expectation or alarm.

6. **Preliminary information.** Before the assessment, compile all the data on the learning facility, such as technical information on hazards and infrastructure, as well as information on the educational community, to document the analysis of the learning facility's geographic area, construction characteristics, or exposure to social situations. After inspecting the setting, check the outside to locate any plaque or label specifying facility construction date and contractor, to complete checklist information.

7. **Recommendations during inspection.** Complete all items—not just a sample—on the checklist. If in doubt, it is preferable to record a lower safety level, since any category described as "low safety level" will require priority action, rather than a higher safety level, which will be assigned less priority for improvements. When completing the checklist, do not make any kind of operational suggestions other than those specified. Individual or group value judgments from assessors should not be considered as part of the process. There is an extra space on the checklist to record any observations that may be useful for preparing the report. These comments will not affect the safety index calculated, which is based on the answers in the checklist, but will be included in the final report on the inspected learning center. In these comments, assessors can justify a decision (e.g., explain why an affirmative or negative answer was given), and record doubts or questions discussed to explain an answer received from the institution, urgently needed measures, or any comment on the facility in general that was not considered in the questions or that requires consultation with other experts.

8. **Assessment systematization, analysis, and conclusions.** When the checklist has been completed, each subgroup should meet to share, consolidate, and discuss findings. A plenary meeting should then be held with all subgroups

for a general presentation of all data collected. According to the discussion and suggestions that arise, the assessment documents will be adjusted as needed or comments added, as relevant. Any contradictions or disagreements arising within the assessment team shall be recorded in the comments.

This document will be adjusted, signed and dated by the assessment team and delivered to the general coordinator, who will file the documentation, update databases and calculate the safety index. The coordinator will also prepare the final report and attach the areas of intervention and general recommendations from the assessment team. At the final meeting, the report will be delivered to the learning facility and the school infrastructure management office, and the learning facility will provide feedback on the assessment process in general and any relevant recommendations for improving future assessments.

The final meeting should define obligations and responsibilities for: (a) the general assessment coordinators to monitor future implementation of any measures required to improve the safety index, and (b) the institution and the school infrastructure management office to implement any measures required within the recommended terms and report on their completion, so that verification inspections may be conducted as agreed. A copy of the final report is filed along with the documentation and evidence gathered in a folder identified with the name of the institution and subdivided according to inspection dates.

As a reference, the data collection instrument used during inspections to determine the School Safety Index at learning facilities consists of about 22 pages and can be used to assess a learning facility with up to eight buildings (Figure 27). If there are more buildings, extra pages can be added. The School Safety Index has been used in countries such as the Dominican Republic through the General Direction of Environmental Risk Management (Dirección General de Gestión Ambiental de Riesgos, DIGAR) of the Ministry of Education of the Dominican Republic (MINERD). It is worth noting that the data collection process does not yet have a digital tool for large-scale systematization that could be linked to Education Management Information Systems[11].

11 https://www.ministeriodeeducacion.gob.do/docs/direccion-general-de-gestion-de-riesgos/cBU0-guia-del-evaluador-indice-de-seguridad-centro-educativo-rdpdf.pdf

1.5. Learning facility construction characteristics Check the relevant box for each building or block at the learning facility. If there are more than eight buildings or blocks, add a copy of this page, which you can find in the annex at the end of this form. (If a characteristic is applicable, check with an "X," if not applicable, leave blank.)									
Building	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Observations**
Elevation above the ground									
The structure rests directly on the ground									
The structure is elevated on pilings									
Columns									
No columns									
Reinforced concrete									
Precast concrete									
Metal (solid)									
Tubular metal (hollow)									
Wood									
Other material (specify): ______________________									
Beams									
No beams									
Reinforced concrete									
Precast concrete									
Metal (solid)									
Tubular metal (hollow)									
Wood									
Metal truss									
Wood truss									
Other (specify): ______________________									
Load-bearing walls									
Reinforced concrete wall									
Precast concrete wall									
Reinforced earth (rammed earth)									
Other (specify): ______________________									
Floor structure slab between levels (if applicable)									
Reinforced concrete									
Metal									
Wood									
Other (specify): ______________________									

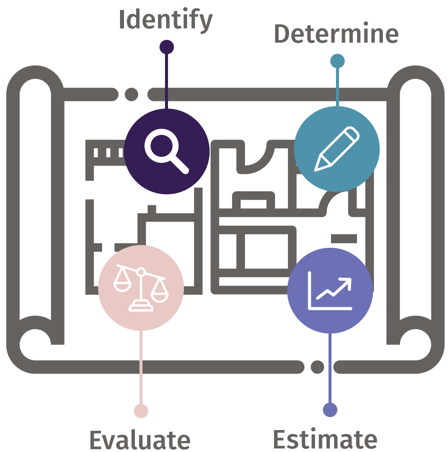
UNICEF | DIPECHO Project VII South America

Figure 27. Partial view of the School Safety Index form (UNICEF)

VISUS Methodology

The VISUS (Visual Inspection for defining Safety Upgrading Strategies) methodology was developed and applied by researchers of the UNESCO Chair, SPRINT-Lab (Safety and Protection Intersectoral Laboratory) of the University of Udine (Italy). It was developed within the framework of school safety assessment in the context of earthquakes in northern Italy in 2009, as part of a project financed with European funds. Since 2010, VISUS has been adopted by UNESCO worldwide as a technical triage methodology to enable school infrastructure managers to make decisions based on scientific data. The methodology currently has a multi-hazard approach aligned with the CSSF objectives, specifically in the activities described in Pillar 1, Safe Learning Facilities, with the following goals:

1. **Identify** the quantity and quality of existing school infrastructure;
2. **Determine** the exposure of school infrastructure to different natural and socio-natural hazards;
3. **Evaluate** possible deficits in school infrastructure;
4. **Estimate** the scale of possible interventions to be performed on school infrastructure, including repair, reinforcement, reconstruction or relocation.



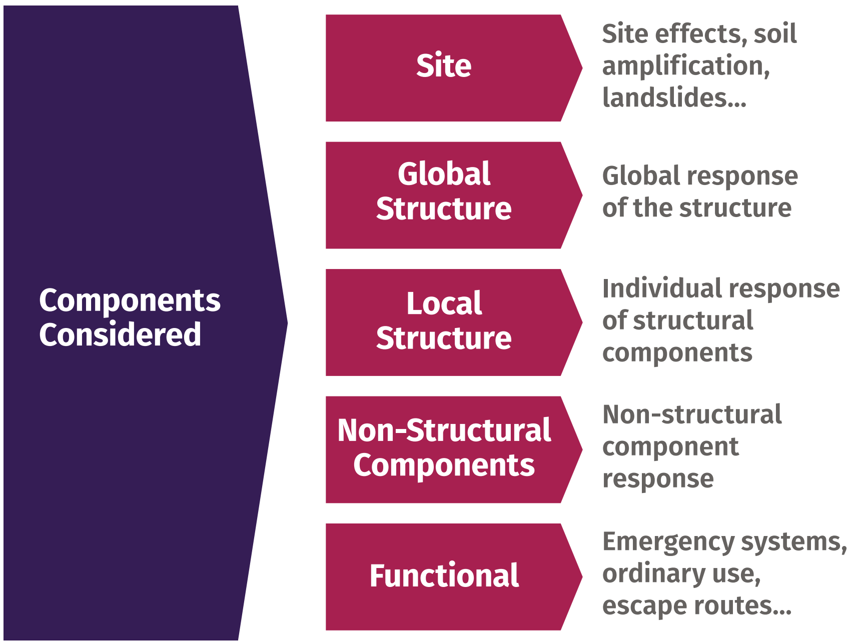


Figure 28. Learning facility components according to VISUS (SPRINT-Lab, University of Udine/UNESCO) (SPRINT-Lab, Universidad de Udine/UNESCO)

To define learning facility safety level, the VISUS methodology divides learning facility components into five main groups, as shown in Figure 28.

Like the School Safety Index, VISUS uses visual inspections to gather information in the field on forms. The variables considered in the forms are defined based on expert reasoning using the Elementary Scenario Reasoning technique (Grimaz and Pini, 1999), which analyzes and encodes the different phases of expert criteria and judgments during assessment.

Based on their knowledge and experience, experts can conduct field inspections to identify indicators that determine the predisposition or degree of susceptibility of different learning facility components that could be affected in case of an adverse event. The expert usually focuses on components considered essential or substantial to define the level of safety at the facility, and can visualize complex situations from small portions of information (Figure 29). The different items in the VISUS forms are selected on the basis of this premise.

Thus, in this methodology, an inspector is defined as the person who collects substantial information in the field, recording it on forms that include graphic indicators representing essential components based upon which the expert can issue a judgment. Once the inspector has gathered the information on substantial elements, it is processed using expert judgment, which is previously encoded to issue a diagnosis regarding expected impacts in case of potential adverse events that could affect the learning facility. Unlike the School Safety Index, judgments are already encoded and systematized,

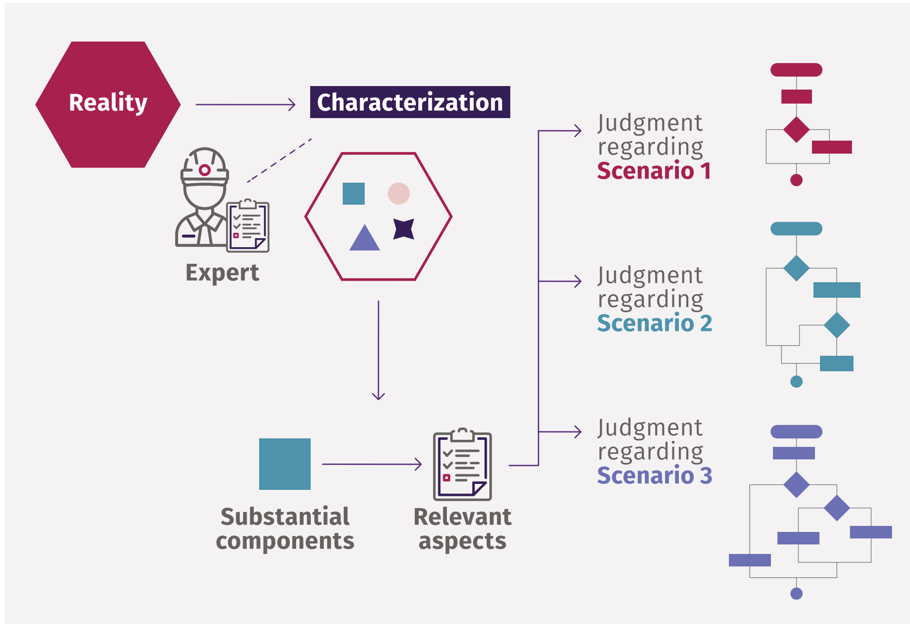


Figure 29. Elementary scenario reasoning with expert opinions (SPRINT-Lab, University of Udine/UNESCO)

reducing subjectivity in conclusions regarding safety levels or interventions required at the learning facility.

The VISUS methodology groups potential adverse events into five types of hazards: events related to water, earth, wind, fire and ordinary use. Each substantial component collected has an incidence on the possibility of a risk scenario occurring. Depending on the level of incidence or number of substantial elements observed, VISUS defines three warning levels using a color code to describe the potential of a scenario occurring: green means that there is no concern of the scenario occurring, orange for situations that could create difficulties at the learning facility, and red for a scenario that is highly likely to occur.

To synthesize the situation at each learning center, VISUS uses circular indicators called warning roses (Figure 30), with needles to summarize the negative impact that could occur in each of the learning facility's components.

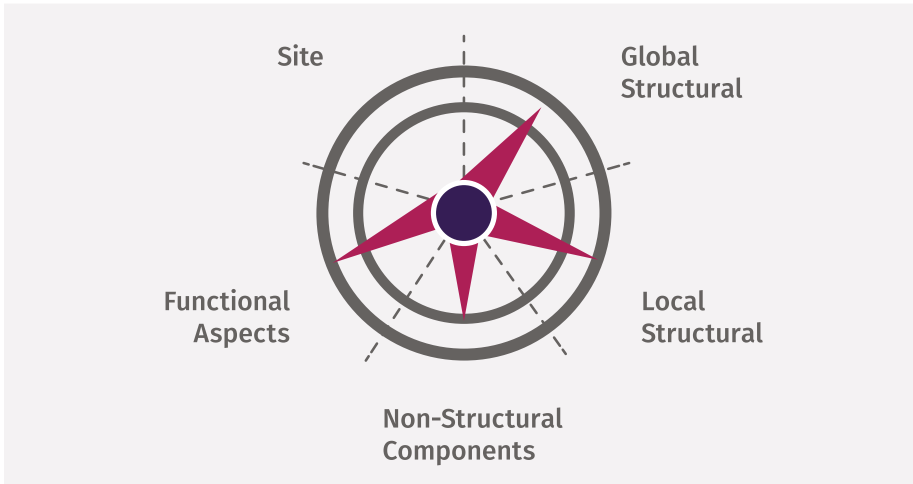


Figure 30. VISUS Methodology warning rose (SPRINT-Lab, University of Udine/ UNESCO)

If the needle touches two of the concentric circles, it indicates warning level 2, which means that intervention is needed on the components indicated in order to safeguard the student community. In Figure 30, warning level 2 is indicated for specific structural components and for functional components.

When the needle only touches one of the concentric circles, it indicates warning level 1, denoting that the indicated components need to be checked to prevent difficult situations for the educational community. In Figure 30, warning level 1 is indicated for non-structural components and for global structure.

If there is no needle touching any of the circles, the warning level is 0, indicating no risk in the relevant component. Figure 30 shows that the construction site has no risk level for the threat evaluated.

A warning rose is constructed for each hazard, and the multi-hazard assessment is represented as the maximum value determined for each of the findings for the different components (Figure 31).

Stars are used as an easy way to describe the situation of the learning facility, much like the star classification used to rate hotel quality. The number of stars reflects the safety level provided by the learning facility based on the warning levels of the different components. Thus, five stars mean that the learning center has a high level of safety with no warning level for any of its components. The absence of stars means that not even the site where the school is located is safe and that the school offers no guarantee of safety. The results are finally represented by a single star based on the maximum number of stars assigned for each possible threat.

As mentioned above, the VISUS methodology uses a triage process to classify learning facilities based on their needs for intervention, grouping them so that decision makers can better plan resource use. The triage concept is similar to the one used in medical emergency situations or emergency rooms to separate and select patients and prioritize their care based on certain indicators for defining the level of emergency in each patient's situation.

Once the warning level has been calculated for each component and the components with deficiencies have been recorded, standard intervention procedures can be applied. To do so, it is useful to have a baseline inventory of the different learning facility components (structural typologies, non-structural component types, among others). Professional associations can be consulted about the interventions, in order to include the approximate

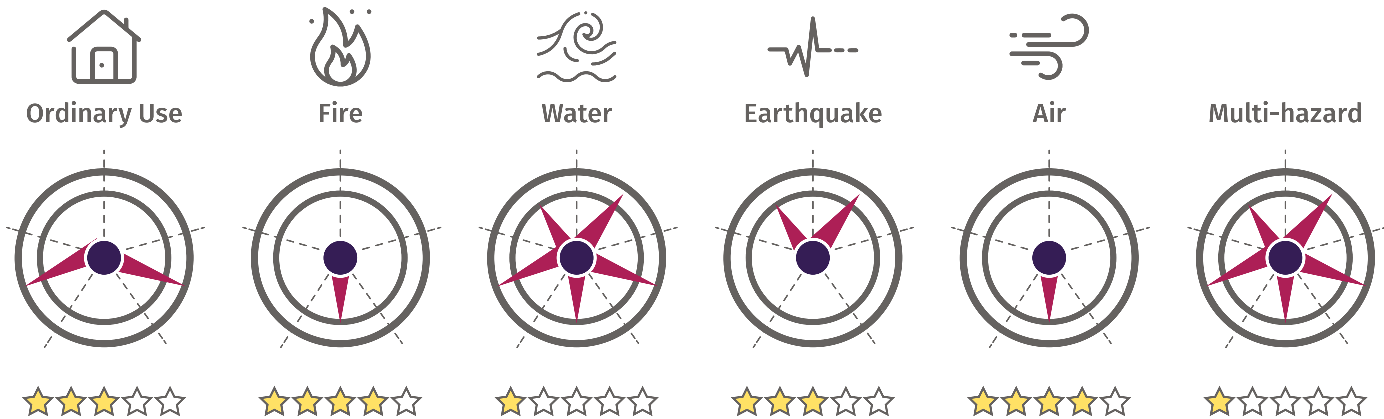


Figure 31. Multi-hazard assessment of safety at the learning facility (SPRINT-Lab, University of Udine/UNESCO)

investment required for each.

Based on the findings, interventions for improving the safety of each component are identified and processed, and the investment that would be needed can be estimated. The total amount required to improve safety in all components is compared to the cost of demolishing and rebuilding a safe learning facility following construction code guidelines and according to student demand.

Figure 32 shows a graphic representation of the investment required to improve a learning facility. In this specific case, investments would be 20% to 40% of the cost of building a new safe learning facility for the existing educational community.

The following are the basic recommendations for adaptation and implementation of the methodology in any context. They require the participation of various institutions. It is recommendable to define a focal point person from each institution to ensure that there is at least one person from each on the local committee to monitor the activities to be performed.

Ministry of Education or other school infrastructure management institutions. These are the final users and owners of the assessments performed using the VISUS methodology. Most ministries of education in the world have a georeferenced database of learning facilities and statistical data on the educational community members. If such information is not available, the methodology provides for the development of this georeferenced base. Similarly, the existence of a

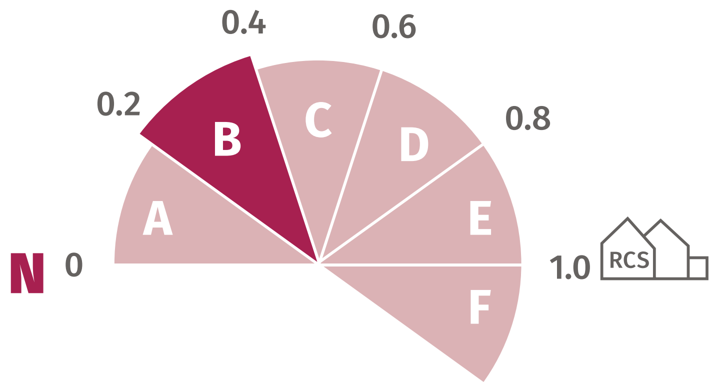


Figure 32. Indicator to evaluate whether it is worth performing interventions at the learning facility (SPRINT-Lab, University of Udine/UNESCO)

technical inventory of infrastructure, preferably including photographic records, facilitates adaptation of the methodology to the specific conditions of the area where it will be implemented.

Ministry of environment, national offices for disaster risk management, or agencies responsible for analyzing the existing hazards in the territory evaluated. Information is needed on the different hazards that affect the country, with maps showing maximum expected levels for each and the period for which they have been calculated. It is also important to have official historical records of extreme natural events that have affected different regions in the country. If hazard maps are not available in the country or for the zones being evaluated, the methodology provides for including other alternatives, such as gathering information on past events through the educational communities.

Universities or other academic institutions. The participation of academia is a basic component to ensure continuity and sustainability in the implementation of the methodology. Educational infrastructure should be assessed every 3 to 5 years at the most. Thus, support from academia ensures the long-term sustainability needed. Preferably, the focal point person of each country or region where the assessment is to be implemented should be a member of the university community, preferably a teacher of civil engineering or architecture.

This person will be responsible for coordinating the information provided by the rest of the institutions involved, both to adapt methodology to local conditions, and to serve as technical liaison with the scientific partners provided by UNESCO and managed by the UNESCO Chair at the University of Udine. Project technical coordination is directly associated with the focal point person, who must coordinate with the rest of the institutions any information requested to adapt and implement the VISUS methodology.

UNESCO through its Chair at the Safety and Protection Intersectoral Laboratory (SPRINT-Lab), with headquarters at the University of Udine. The UNESCO Chair, developer of the VISUS methodology, makes available to ministries of education worldwide the platform for processing the information collected in the countries where the methodology is implemented and where individual reports are prepared for each school, as well as the collective report with the main findings of the overall inspections for a given territory, region or country.

Ministries of education can manage the platform and link it to their Education Management Information Systems. Moreover, the scientific staff at the UNESCO Chair and the members of the world scientific committee for the VISUS methodology provide technical support for implementation of the methodology in different contexts worldwide.

Other agencies. The participation of other agencies such as civil protection institutions, engineering and architecture associations, and others related to infrastructure safety aspects is needed to gain a better picture of the safety situation at learning facilities. These agencies can provide information on different topics related to adaptation and implementation of the methodology, such as reference construction costs in the country and hazard maps, among others.

The VISUS methodology is implemented in five phases:

1. **Adapting the methodology to local conditions.** The methodology needs to be adapted to local conditions, clearly defining hazard levels, possible structural building types at learning facilities, and local construction costs.

2. **Organizing training sessions.** Once the committee has been defined and the information for manuals and forms has been prepared, training sessions are required for inspectors and decision makers. There are three types of training: training for decision makers (personnel from the ministry of education or school infrastructure management), training for instructors (teachers and school infrastructure technical managers) and training for inspectors (university teaching staff, school infrastructure technical managers and students in their final year of civil engineering or architecture programs).

3. **Field inspection planning and deployment.** The routes and

logistics needed for inspections are defined jointly with local committee members. Inspections are preferably coordinated by a university teacher or an engineer from the ministry of education and performed by three students in their final year (preferably civil engineering or architecture programs). The teacher and the personnel from the ministry of education or school infrastructure managers coordinate the inspections with learning facility directors (permission for entry, date, etc.).

4. **Assessment report.** The information collected at each learning center is processed to prepare individual reports. A general report is prepared with a summary of the main points from the individual reports.

5. **Support for intervention planning.** Once the assessment information is available, a way must be found to coordinate the outcomes with national and local development plans, ministry of education or ministry of public works infrastructure plans, and national risk management strategies. The resources required for the interventions identified in the global assessment report need to be procured.

To record the substantial information to define learning facility vulnerability level, VISUS encodes a series of "observables" graphically by means of icons that are easily understood by inspectors. These observables are grouped according to hazard type and included on the forms to be completed during field inspections (Figure 33). Considering the recommendations from the United Nations Disaster Risk Reduction Office (UNDRR), these observables are based on multi-hazard scenarios, providing better understanding of cascading risks and systemic risk, in general.

The methodology's judgment and evaluation process has been systematized and organized employing a series of flow diagrams connecting the influence of the substantial components captured in the field to the possible scenarios that could impact the learning facility (Figure 34).

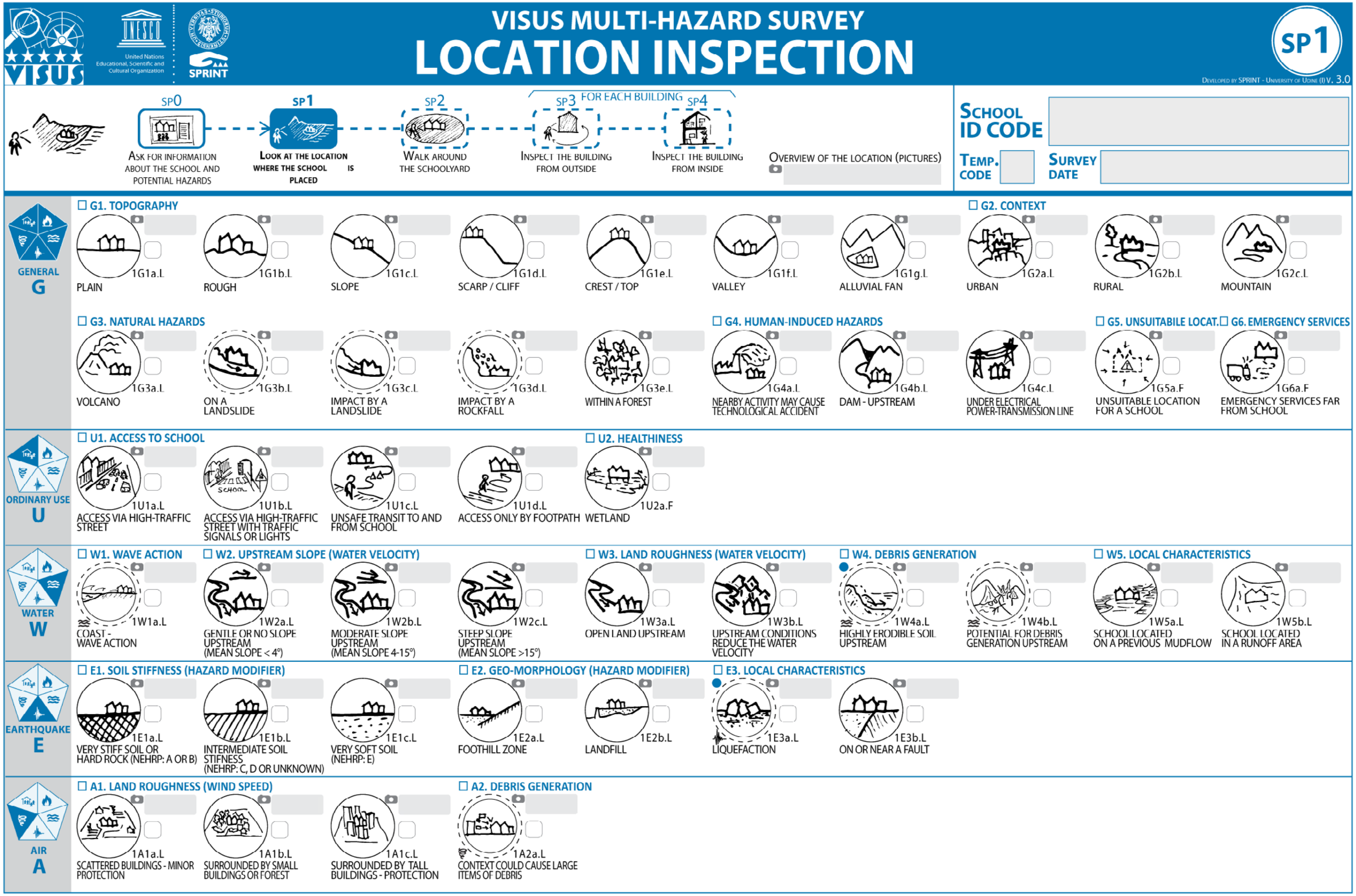


Figure 33. Partial view of the VISUS form (SPRINT-Lab, University of Udine/UNESCO)

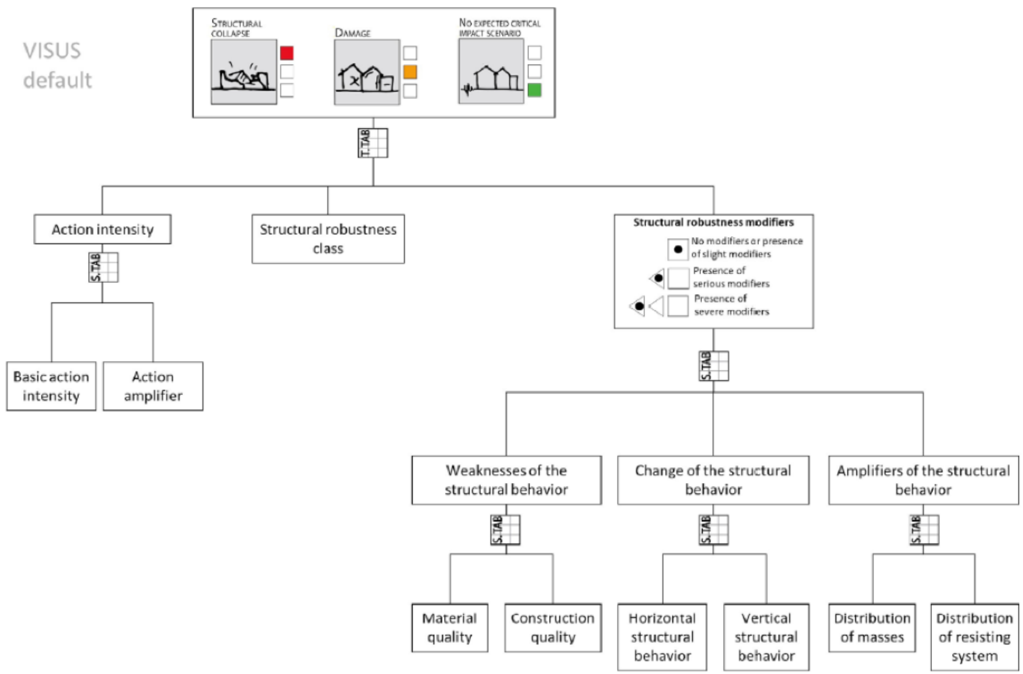


Figure 34. Basic outline of VISUS algorithms (SPRINT-Lab, University of Udine/UNESCO)

Section 4

Experiences in implementation of the visus methodology

There are 3 VISUS methodology manuals (Figure 35), prepared by the SPRINT-Lab, University of Udine, with support from UNESCO:

Volume 1: Introduction to learning facilities assessment and to the VISUS methodology.[12] This manual contextualizes the concept of School Safety and frames it in the different development agendas, describing the general features of the methodology and the outcomes of its implementation.

Volume 2: VISUS Methodology.[13] Explains the theoretical aspects of the VISUS methodology, with annexes presenting the rules and criteria that are the basis for assessments.

Volume 3: VISUS Implementation.[14] Explains the different phases of VISUS implementation, with annexes presenting the tools that have been developed for its application.

12 https://unesdoc.unesco.org/ark:/48223/pf0000371185

13 https://unesdoc.unesco.org/ark:/48223/pf0000371185

14 https://unesdoc.unesco.org/ark:/48223/pf0000371185

Figure 35. VISUS Methodology manuals (UNESCO/SPRINT-Lab, University of Udine)

The methodology has been implemented at the pilot level in Italy, El Salvador, Laos, Indonesia, Haiti, Peru, and Mozambique. A multi-hazard approach was used, except in Italy and El Salvador, where it initially focused only on seismic hazard assessment.

With the aim of providing information on the implementation of the methodology in multi-hazard mode, this section describes the experience in implementing the VISUS methodology in a pilot project in Peru, which has served as a reference for implementation in other countries.

Peru pilot project

In 2016, the metropolitan area of the city of Lima, Peru was selected for the assessment of 53 learning facilities using the VISUS multi-hazard methodology. The city was selected within the framework of the International Platform for Reducing Earthquake Disaster (IPRED) Initiative. This pilot project was financed by the European Commission through a DIPECHO subsidy in collaboration with Save the Children and Plan International.

Adaptation of the VISUS methodology to the context in the Metropolitan Area of the City of Lima

In 2016, UNESCO launched the implementation of an international program to evaluate safety at 53 learning facilities using the VISUS methodology in Lima, in coordination with the Ministry of Education of Peru, the National Institute for Civil Defense (Instituto Nacional de Defensa Civil. INDECI), the National Center for Disaster Risk Reduction and Prevention (Centro Nacional para la Prevención y Reducción del Riesgo de Desastres, CENEPRED), the Municipality of Lima, and the UNESCO office in Lima. Technical coordination for implementation was provided by personnel from the Peruvian-Japanese Center for Seismic Research and Disaster Mitigation (CISMID), which belongs to the School of Civil Engineering of the National University of Engineering (FIC-UNI). A focal point person was designated, with support from UNESCO and in coordination with the SPRINT-Lab of the University of Udine, to approach the Ministry of Education (MINEDU) and the Ministry of Environment (MINAM).

The MINEDU provided official georeferenced information on learning facilities, including a series of reports describing the different building types. The MINAM, the INDECI, and the CENEPRED provided the different hazard maps for the zone. Information on current costs in the construction sector was requested from the Peruvian Chamber of Construction. The focal point person, the MINEDU, and the school infrastructure managers selected 53 learning facilities subject to different conditions, located in coastal zones, mountainous zones, urban zones, and rural zones, considering the number of students and schooling level provided, among other factors (Figure 36).

Once the information had been collected, it was processed to adapt it to the VISUS methodology. Building construction periods were reported, as well as the acceleration values with which the different building types had been designed. A list was prepared of the possible interventions for improving building structural behavior from a technical standpoint, including possible repair and reinforcement techniques, previously identified in projects financed by other GADRRRES members.

Each possible intervention was budgeted to calculate the approximate reference cost of the investment that would be required for potential implementation at a learning facility. Reference construction costs were also included for new learning facilities according to the building types used in the country. Demolition costs were estimated. The manuals and forms were translated and adapted to the conditions in the country. An app was developed on which each observable on the checklist could be selected and photographed.

Training sessions

Meetings were held with MINEDU school infrastructure managers to train them in the methodology and the inputs that it would generate as a result of its use. Next, teachers, FIC-UNI students, MINEDU regional school infrastructure

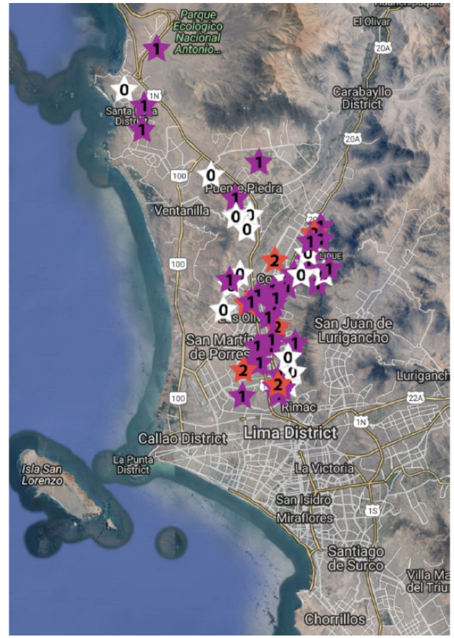


Figure 36. Location of learning facilities and route established (SPRINT-Lab, University of Udine/UNESCO)

managers, and CISMID professionals were trained using the previously translated manuals and checklists/forms. A CISMID area and buildings were used for a preliminary practice session using hardcopy forms, so that inspectors could ask questions and learn how to use the app, and estimate how long it would take to conduct an inspection at a learning facility.

Inspection planning and implementation

A route was planned for inspecting the selected learning facilities, scheduling 10 inspections per day. Five groups of three final-year civil engineering students were formed, accompanied by one CISMID teacher and one MINEDU school infrastructure manager. Each group performed one inspection during the morning and another during the afternoon.

The MINEDU school infrastructure manager, in coordination with the school director, provided information on the learning center. They informed teaching and administrative staff, parents, and students about the inspections. The MINEDU infrastructure manager provided technical support to the team of assessors regarding any intervention or modification known to have been performed at the learning center.

The university teacher accompanying the group of civil engineering students advised them on any criteria about which they had questions, suggested the logistics for conducting the inspections optimally, supervised compliance with timing, guaranteed the information collected by the civil engineering students and validated it for processing.

The final year civil engineering students acted as inspectors, completing the forms on the app, recording and photographing all the observables. Each student had a different role during inspections. One directed the inspection, using the app to collect and photograph the observables, while the other two inspected the components and measured the buildings, as required.

The following supplies were used during inspections:

- Mobile device with good quality camera and GPS for recording field information. The devices were purchased with project funds.
- Laser distance meters for measuring building dimensions quickly, also purchased with project funds.
- Paper for taking notes or making calculations; pencil and eraser.
- Clipboard.
- Standard calculator.
- Toolboxes.

Assessment report
Once the inspections had been reviewed, the forms recorded in the app were sent to the SPRINT-Lab for processing. Each activated observable was processed using the flow diagrams included in the VISUS processing modules, in turn activating the different alerts according to hazard values reported. Depending on the warning level found, the program assigned a risk level to each component and the intervention level required.

An individual report was created for each learning facility, including a photographic record of the findings during the inspections. Reports were included in a georeferenced system for subsequent review by authorities at the Ministry of Education (Figure 37).

A summary was also prepared of the information (global report), which learning facility administrators could use for making decisions. A global report shows the VISUS indicators established for each learning facility, enabling the decision-making process to be based on facility safety improvement criteria (Figure 38).

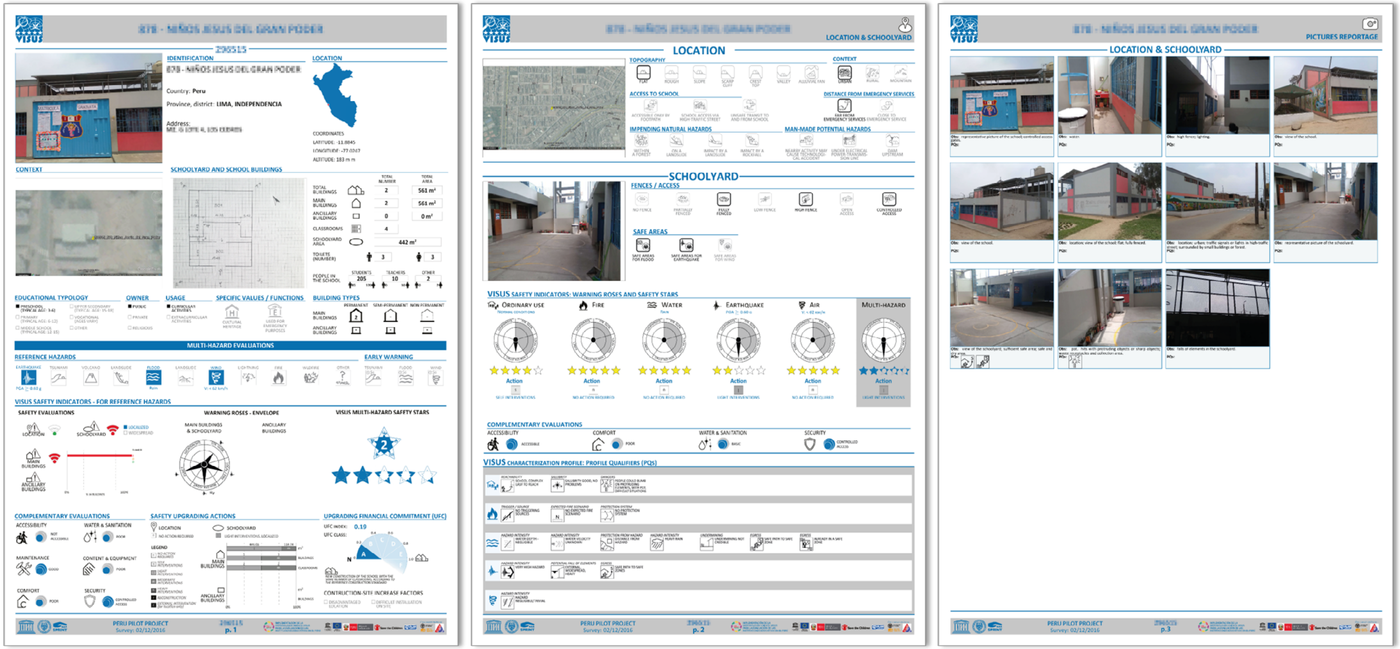


Figure 37. Learning facility georeferencing and sample of individual reports (SPRINT-Lab, University of Udine/UNESCO)

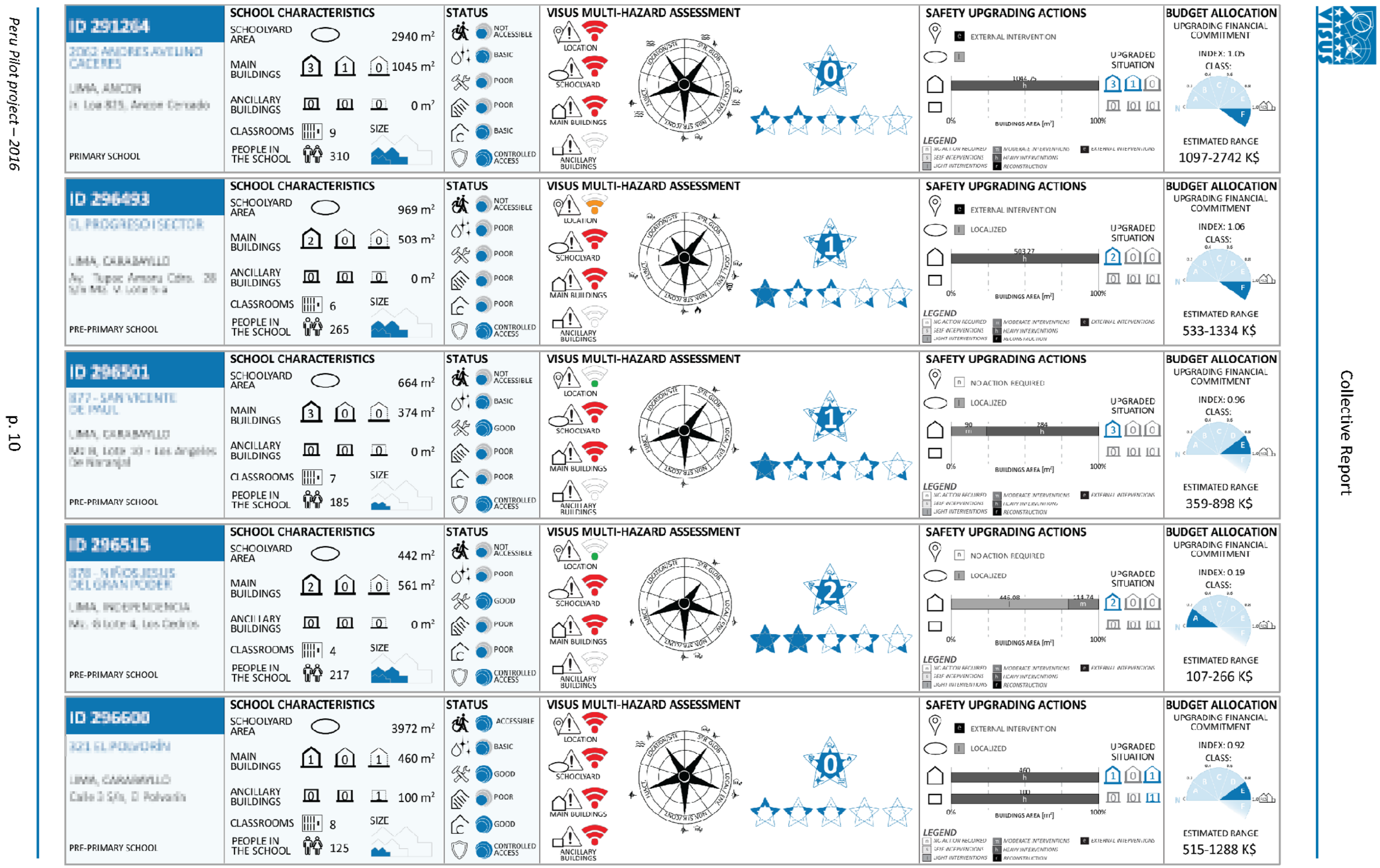
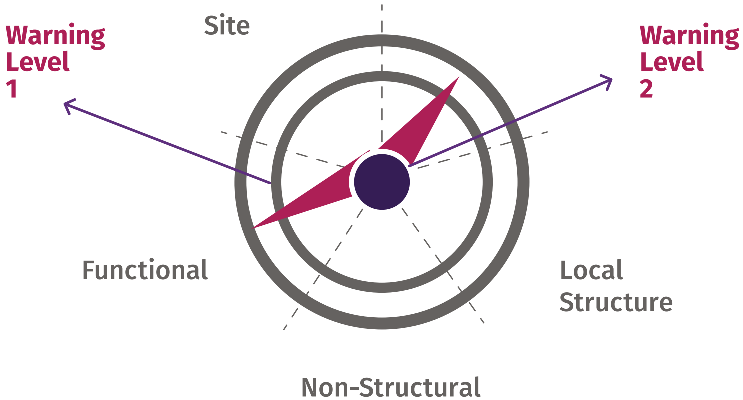


Figure 38. Global report on the learning facilities evaluated (SPRINT-Lab, University of Udine/UNESCO)



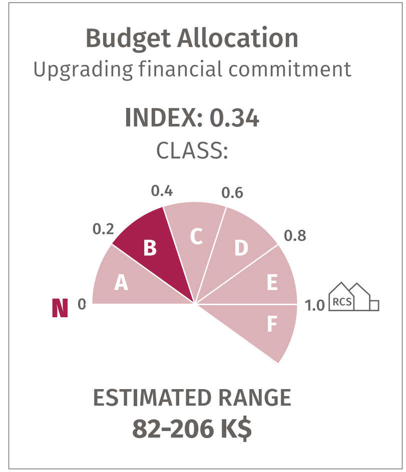
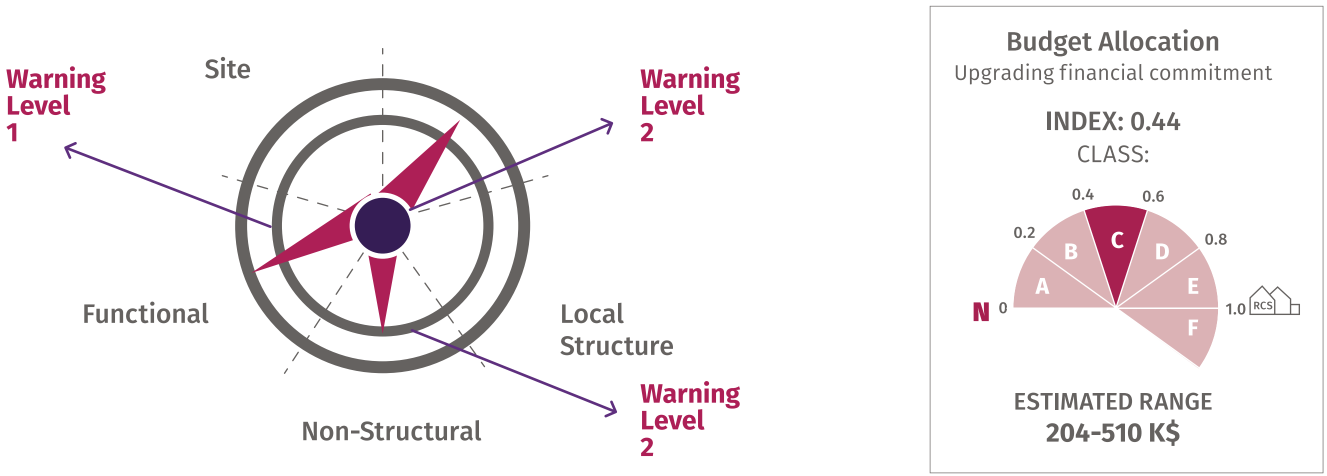


Figure 39. Learning facility with warning level 2 for Site Conditions (SPRINT-Lab, University of Udine/UNESCO)

Support for planning interventions

The information was discussed with MINEDU staff, SPRINT-Lab staff, and the project focal point person at the CISMID. They analyzed the possibility of implementing interventions based on the interpretation of the information reported by the VISUS methodology. For example, depending on available funds, a strategy could be defined to improve or recover learning facilities located at sites with a high risk of natural hazards. In this scenario, it is recommended to review the cases for which the warning rose shows as level 2 for construction site (Figure 39) since the site does not ensure safety for the occupants (due to possible flooding zone or nearby landslide) regardless of the type and quality of existing buildings.

Another strategy that could be adopted is to intervene in learning facilities that are in safe sites and require interventions that do not put occupant safety at risk. In this case, the warning rose should indicate level 0 for construction site and for the global structure (Figure 40).



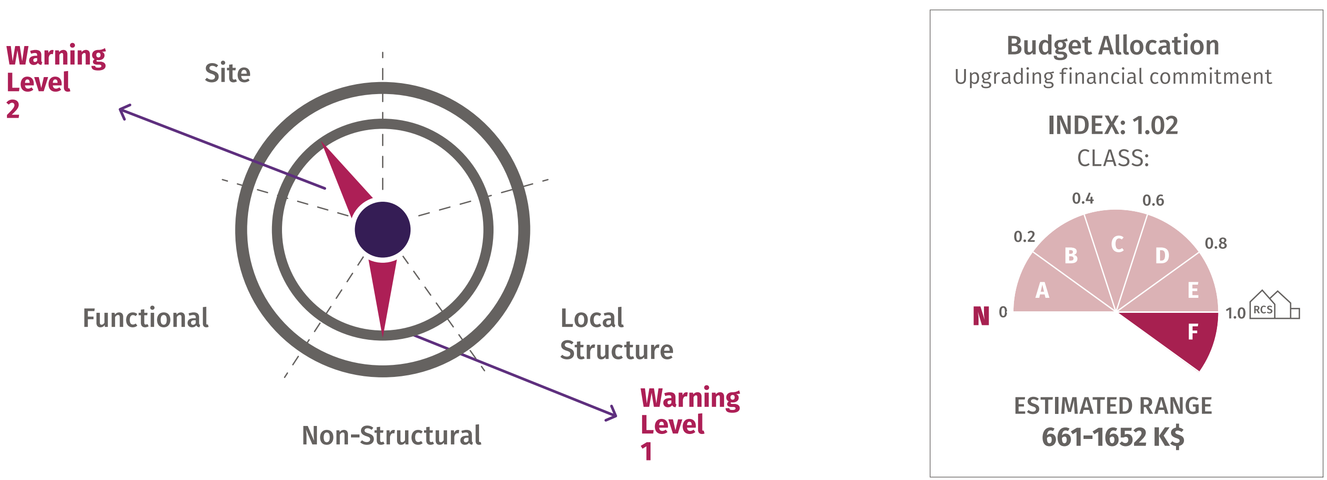


Figure 40. Comparison of learning facilities with warning level 2 for Global Structure. (SPRINT-Lab, University of Udine/UNESCO)

Based on available funding, once the strategy has been identified, those investments can be prioritized by ordering the results found by the index of appropriateness for interventions, which describes the approximate amounts needed for investment.

Challenges during implementation
The following are challenges that may arise while applying the methodology in each of its stages, based on the experience from the pilot project in Peru:

- **Adaptation of the information**
  Since this was a pilot project, it took a long time to collect the required information because institutional personnel responsible for the information were busy performing their regular activities. This highlights the need to share technical information among the different government institutions, specifically information related to hazard maps, which should be available to the rest of the institutions. One strategy that has proven highly efficient is to invite implementing partners and make sure that they are always duly informed of the different processes, as well as their roles and responsibilities in project implementation.

- **Training sessions**
  Training sessions should be scheduled in advance, especially for students in their final year of civil engineering or architecture, opting for dates when they do not have too many academic activities. It is worth noting that they were enthusiastic to participate in the project because it provided a chance to apply and reinforce their knowledge in the field, while at the same time contributing to learning facilities in the country. Participating in the project also added value to their training, and the university was able to monitor human resource training.

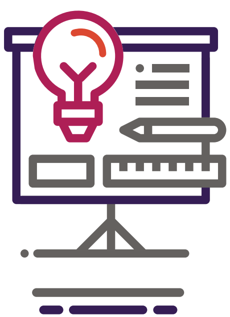
- **Inspection planning and implementation**
  Inspection logistics included transportation and meals for the students, teachers and MINEDU personnel who spent the day inspecting. These logistic expenses were covered by pilot project funds, but need to be considered if the project is to be paid for using the country's own resources.

- **Assessment report**
  Individual reports were sent via the GoogleMaps platform, where they could be viewed, providing better information on the learning

facility. It is worth highlighting the relevance of this information being publicly available because it may be subject to misinterpretation, or consider defining a communication strategy in order to inform the learning facility managers and the rest of the educational community.

- **Intervention planning support**
  The pilot project concluded with the delivery of the information and the description of possible ways of using it. The subsequent strategy to be applied depended on the school infrastructure managers and the higher authorities. The methodology enabled guidelines to be established for investments in school infrastructure, by providing technical information based on scientific considerations such as risk information and engineering concepts.

Final considerations



Without considerable progress in school safety, it will be impossible to meet the commitments assumed in the sustainable development agendas for adaptation to climate change and disaster risk reduction, which have been adopted by every country in Latin America and the Caribbean. Schools—understood not only as places where learning processes take place but also as hubs where community and institutional evolutions converge—provide a unique opportunity for accelerating the social transformations needed to achieve resilience of individuals, communities, and thereby, countries.

The constantly evolving Comprehensive School Safety Framework provides a roadmap that sets the educational community at the center of planning. Its holistic view provides understanding of school safety in all its dimensions, including school infrastructure, risk management, and education continuity, as well as education for sustainability, climate action, and disaster risk reduction.

In the context of our world's complex interconnections, where the negative effects of different kinds of hazards are heightened by interaction with climate change, fragile ecosystems, pre-existing inequality, and political and financial instability, school safety needs to be understood as a priority not only by ministries of education but by all sectors and society as a whole.

The COVID-19 pandemic is a clear example of exacerbated systemic risk. It has shown us that the nature and scale of risk have changed so much that established risk management approaches no longer suffice, and the scope of institutions is severely limited. Educational systems in the region are no exception. In addition to responding to the pandemic, they have confronted a series of particularly active hazards, including hurricanes, volcanoes and earthquakes in different parts of the region, which are still affecting the education sector and testing its capacity to face multiple hazards simultaneously.

One of the aims of the CAF-UNDRR Safe Schools Guide is to foster multiple-stakeholder dialogue and action in order to understand and manage systemic risks in the education sector.

The guide also provides tools and information to help Ministries of Education in Latin America and the Caribbean make decisions on where and how to invest available resources most efficiently. These investments should reinforce learning facility safety and support capacity-building in ministries and their strategic partners for educational infrastructure evaluation, disaster risk management at schools, and education for resilience.

The guide recognizes the importance of the three pillars of the Comprehensive School Safety Framework and how they work together to achieve the aims of:

1. Keeping students and educators are safe from death, injury and harm in schools;
2. Planning continuity of education in the face of expected hazards;
3. Strengthening disaster-resilient citizenship through education; and
4. Safeguarding investment in the education sector.

However, this guide focuses on actions related to Pillar 1, Safe Learning Facilities, offering to school infrastructure managers in different countries technical input to consider for ensuring infrastructure safety at all learning facilities. This covers both new and existing buildings and includes methodologies for evaluating existing school infrastructure.

We hope this guide will inspire the many actors in the educational sector and other areas to design school safety strategies and education infrastructure projects that will strengthen resilience of educational systems, and through them achieve the goals established in the 2015-2030 development agendas.

Bibliography

Adams, J., Bartrma, J., Chartier, Y. and Sims, J. 2009. *Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings.* Geneva, World Health Organization. https://www.who.int/water_sanitation_health/publications/wash_standards_school.pdf

Arup. 2013. *Characteristics of Safer Schools.* London, Arup International Development. https://www.gfdrr.org/sites/default/files/170120_Characteristics%20of%20Safer%20Schools_Report_Arup.pdf

ASSI. 2018. *About the ASEAN Safe School Initiative.* https://aseansafeschoolsinitiative.org/about-assi/

Bastidas, P. and Petal, M. 2012. *Assessing School Safety from Disasters: A Global Baseline Report.* Geneva, ISDR Thematic Platform for Knowledge and Education, United Nations Office for Disaster Risk Reduction. https://www.unisdr.org/files/35274_2012schoolsafetyglobalbaseline.pdf

Boroschek, R. and Retamales, R. 2004. *Guidelines for Vulnerability Reduction in the Design of New Health Facilities.* PAN American Health Organization/World Health Organization. https://www3.paho.org/disasters/index.php?option=com_docman&task=doc_download&gid=16&Itemid=&lang=en

CDEMA. 2019. *About the Model Safe School Programme in the Caribbean.* https://www.cdema.org/model-safe-school-programme-in-the-caribbean-project

Cortes, F. R., Holm-Nielsen, N. B., Bogaerts, V. R., Ishizawa, O. A., Ferreira, C. F., Atoche, J. C., Sanchez, J. G. and Obando, L. D. 2016. *Roadmap for Safer*

Schools. Guidance note. The World Bank/ GFDRR/ARUP. https://www.gfdrr.org/sites/default/files/publication/gfdrr-roadmap-05.pdf

Centre for Research on the Epidemiology of Disasters, and, UNDRR. 2020. *Human Costs of Disasters. An overview of the last 20 years 2000-2019.* https://www.undrr.org/media/48008/download

Education Funding Agency. 2015. School Building Design and Maintenance. London, Government of the United Kingdom. https://www.gov.uk/government/collections/school-building-de-sign-and-maintenance

Fanchiotti, M., Pavlova, I., and, Torres, J. 2018. *Science and Education for disaster risk reduction: the role of UNESCO.* RISCOS - Associação Portuguesa de Riscos, Prevenção e Segurança. Estudos Cindínicos, Coimbra, Portugal.

FEMA. 2003. *HAZUS-MH MR4 Technical Manual.* National Institute of Building Sciences and Federal Emergency Management Agency (NIBS and FEMA), 712.

FEMA. 2010. *Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds.* Washington DC, Federal Emergency Management Agency. (FEMA P-424.) https://www.fema.gov/sites/default/files/documents/fema_p-424-design-guide-improving-school-safety.pdf

GADRRRES. 2015. *Worldwide Initiative for Safe Schools.* https://gadrrres.net/resources/worldwide-initiative-for-safe-schools

GADRRRES. 2015. *Towards Safer School Construction: A Community-based Approach.* UNESCO/ARUP/Save the Children/GFDRR/Risk Red. . https://www.gfdrr.org/sites/default/files/publication/45179_towardssaferschoolconstruction2015_0.pdf

GADRRRES. 2017. *Comprehensive School Safety.* https://www.undrr.org/publication/comprehensive-school-safety

Grimaz S., and Pini A. (1999): *Valutazione del rischio incendio e della sicurezza equivalente.* Fire risk assessment and equiva- lent safety. EPC Libri

Grimaz S., and Malisan P. 2019. *UNESCO Guidelines for Assessing Learning Facilities in the Context of Disaster Risk Reduction and Climate Change Adaptation.* Volume 2 - VISUS Methodology. UNESCO, Paris. https://unesdoc.unesco.org/ark:/48223/pf0000371186

Grimaz S., and Malisan P. 2019: *UNESCO Guidelines for Assessing Learning Facilities in the Context of*

Disaster Risk Reduction and Climate Change Adaptation. Volume 3 - VISUS Implementation. UNESCO, Paris. https://unesdoc.unesco.org/ark:/48223/pf0000371188

Grimaz, S., Malisan, P. and Torres, J. 2015: *VISUS Methodology: A Quick Assessment for Defining Safety Upgrading Strategies of School Facilities.* In: Planet@Risk, 3(1): 126- 136, Davos: Global Risk Forum GRF Davos.

Grimaz, S., Malisan, P. and Zorzini, F. 2016. *VISUS Multi-hazard Training. Internal report for UNESCO.* Paris, UNESCO.

Hwang, D. J. and Okimoto, D. K. 2014. *Home- owner's Handbook to Prepare for Natural Disasters, 3rd edn.* University of Hawai'i Sea Grant College Program. https://dod.hawaii.gov/hiema/files/2016/03/webhomeownershandbooknatural_hazards_0.pdf

INEE. 2009. *Guidance Notes on Safer School Construction.* Global Facility for Disaster Reduction and Recovery. UNISDR/Inter-Agency Network for Education in Emergencies/The World Bank. http://www.preventionweb.net/files/10478_GuidanceNotesSaferSchoolConstructio.pdf

Inter-American Development Bank. 2019. *About the School Infrastructure Regional Census.* https://www.iadb.org/en/sector/education/learning-21st-century-schools/census

Ireland, S. 2016. *Education Disrupted: Disaster Impacts on Education in the Asia Pacific Region in 2015.* Singapore, Save the Children. https://resourcentre.savethechildren.se/sites/default/files/documents/education_disrupted_save_the_children_full_report.pdf

Knowles, S. 2011. *The disaster experts: Mastering risk in modern America.* The City in the Twenty- First Century Series, University of Pennsylvania.

McDiarmid, P. 2008. *In the Face of Disaster: Children and Climate Change.* London, Save the Children. https://resourcecentre.savethechildren.net/library/face-disaster-children-and-climate-change

Mercy Corps. 2009. *Water, Sanitation and Hygiene Guidelines.* Mercy Corps, USAID. https://www.mercycorps.org/sites/default/files/WASH%20 Guidelines.pdf

Paci-Green, R., Pandey, B., Gryc, H., Ireland, N., Torres, J., and, Young, M. 2019, *Challenges and benefits of community-based safer school construction.* International Journal of

Disaster Risk Reduction, November 2019, 101384.

Sanchez, J. 2019. ***Evaluación de la vulnerabilidad sísmica estructural considerando el efecto de columna corta.*** Facultad de Ingeníerial. Universidad Nacional Autonoma de México.

Steinfeld, E. 2005. ***Education for All: The Cost of Accessibility.*** Washington DC, The World Bank. (Education Notes 38864.) https://openknowledge.worldbank.org/handle/10986/10324

Torres, J. 2019. ***Crossing borders: A comparative assessment of community resilience to natural hazards in Arica and Parinacota (Chile) and Tacna (Peru) regions.*** Istituto Universitario di Studi Superiori di Pavia. Italy

Torres, J., Anglès L., Grimaz S., Malisan P.; ***2019 UNESCO Guidelines for Assessing Learning Facilities in the Context of Disaster Risk Reduction and Climate Change Adaptation.*** Volume 1 - Introduction to learning facilities assessment and to the VISUS methodology. UNESCO, Paris. https://unesdoc.unesco.org/ark:/48223/pf0000371185

UNICEF. 2012. ***Water, Sanitation and Hygiene (WASH) in Schools.*** Division of Communication, United Nations Children's Fund. https://www.unicef.org/publications/files/CFS_WASH_E_web. pdf

United Nations. 1970. ***Resolution 2717. Assistance in the case of natural disaster.*** Resolutions adopted on the reports of the Third Committee. http://www.worldlii.org/int/other/UNGA/1970/106.pdf

United Nations. 1971. ***Methods of Projecting the Economically Active Population.*** https://www.un.org/en/development/desa/population/publications/pdf/manuals/economy/manual5/chapter3.pdf

United Nations. 1989. ***Resolution 44/236. International Decade for Natural Disaster Reduction.*** Resolutions adopted on the reports of the Second Committee. http://www.gdrc.org/doyourbit/disasters-44-236.pdf

United Nations. 2005. ***Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters.*** Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6).

United Nations. 2008. ***Report of the Conference of the Parties on its fourteenth session, held in Poznan from 1 to 12 December 2008.*** Part One: Proceedings. https://unfccc.int/

resource/docs/2008/cop14/eng/07.pdf

United Nations. 2015. *Sendai Framework for Disaster Risk Reduction 2015-2030.* https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

United Nations. 2015. *Resolution 69/284 adopted by the General Assembly on 3 June 2015.* Establishment of an open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction. A/RES/69/284. https://undocs.org/A/RES/69/284

United Nations. 2015. *Resolution 70/1 adopted by the General Assembly on 25 September 2015.* Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1. https://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

United Nations. 2015. *Adoption of the Paris Agreement.* FCCC/CP/2015/L.9/Rev.1. https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf

United Nations. 2016. *One humanity: shared responsibility Report of the Secretary-General for the World Humanitarian Summit.* Resolution A/70/709. United Nations. https://reliefweb.int/sites/reliefweb.int/files/resources/Secretary-General%27s%20Report%20for%20WHS%202016%20%28Advance%20Unedited%20Draft%29.pdf

United Nations. 2017. *New Urban Agenda.* Quito. United Nations. http://habitat3.org/wp-content/uploads/NUA-English.pdf

United Nations. 2017. *Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction.* Sustainable development: disaster risk reduction. Adopted Resolution A/71/644. United Nations Seventy-first session, General Assembly. https://www.preventionweb.net/files/50683_oiewgreportenglish.pdf

United Nations. 2018. *The Sustainable Development Goals Report 2018.* New York, United Nations. https://unstats.un.org/sdgs/report/2018

United Nations (ECLAC – UNDRR) 2021. *The coronavirus disease (COVID-19) pandemic: an opportunity for a systemic approach to disaster risk for the Caribbean.* March 2021, https://repositorio.cepal.org/handle/11362/46732

UNDRR. *2019, Global Assessment Report on Disaster Risk Reduction, Geneva, Switzerland, United Nations Office*

for Disaster Risk Reduction (UNDRR). https://gar.undrr.org/

UNDRR. 2019. *About the Worldwide Initiative for Safe Schools.* https://www.unisdr.org/we/campaign/wiss

UNDRR. 2019. *About the Caribbean Safe Schools Initiative.* https://eird.org/americas/safe-school-caribbe- an/2019/

UNESCO. 2014. *Teaching and learning: achieving quality for all;* EFA global monitoring report, 2013-2014. Paris, UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000225660

UNESCO. 2016. *Education 2030: Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4:* Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Paris, UNESCO. https://unes- doc.unesco.org/ark:/48223/pf0000245656

UNESCO. 2018. *Re-orienting Education Management Information Systems (EMIS) towards inclusive and equitable quality education and lifelong learning.* Paris, https://unesdoc.unesco.org/ark:/48223/pf0000261943

UNICEF. 2015. *The Impact of Climate Change on Children. New York, United Nations Children's Fund.* https://www.unicef.org/media/50391/file/Unless_we_act_now_The_impact_of_climate_change_on_children-ENG.pdf

UNISDR. 2007. *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters.* Geneva, UNISDR. https://www.unisdr.org/we/inform/publications/1037

Wisner, B. (2016). *Vulnerability as concept, model, metric and tool. Oxford Research Encyclopedia of Natural Hazard Science.*

World Bank, 2018. *Global Program for Safe Schools – Making schools resilient at scale.* Personal communication. July 19, 2018.

World Bank. 2019. *Roadmap for Safer and Resilient Schools: phases and steps.* Personal Communication. January 2019.

Annex 1

School safety: How we got here

Governments have always assigned a central role to education that has been widely recognized in international conventions and declarations. Great efforts have been made to improve educational opportunities, quality, and relevance. Since the signing of the Universal Declaration of Human Rights, which states that ***every person has a right to education***, it has been considered essential for the exercise of most other human rights.

The school safety agenda derives from human rights, specifically the right to education. Education provides the skills that people need to achieve their full potential and exercise their other rights, such as the right to life and health.

Disasters and conflict create instability. The result of instability is often that basic human rights established by the Universal Declaration of Human Rights are limited or denied to a certain group of people.

For example, children who do not go to school are at greater risk of abuse and violations of human rights. Consideration of children’s human rights and welfare should be the top priority in the planning of any school safety strategy and action plan.

The United Nations Convention on the Rights of the Child was adopted and opened for signature, ratification and accession at the United Nations General Assembly held on November 20, 1989. Among other points, the Convention urges signatory States to **ensure that children receive the protection and care needed for their wellbeing** and that the institutions, services, and establishments in charge of caring for and protecting children comply with the standards established by competent authorities, particularly regarding the safety, health, number and competence of their personnel.

These universal frameworks have been accompanied by the evolution of the discourse on disasters and the need to place the topic of school safety at the center of development. In the first phases of the Cold War, and particularly during the 1960s and 1970s, disasters were considered to be extreme events and attention mainly focused on relief and rescue. The focus on disaster centered mainly on hazards, and disasters were considered to be caused only by natural events.

During the 1970s, there was still a strong belief that nature could be controlled and humans could somehow influence how natural events unfolded (Knowles, 2011; Wisner, 2016), perceiving nature as an enemy and disasters as a natural consequence of environmental evolution. This is why, at that time, the international community erroneously discussed "natural disasters."

It is not exaggerated to say that when the United Nations launched the International Decade for Natural Disaster Reduction (IDNDR), attention focused on controlling nature itself, not on the human aspects of disaster risk. The aim was to reduce the loss of life, damage, and social and economic losses caused by disasters of natural origin, especially in developing countries, through concerted international action.

The United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 was an important milestone in the evolution of the current global agenda, including the school safety agenda. For the first time, topics like **sustainability, poverty reduction, women's rights, challenges to small islands, vulnerabilities,** among many others, were included in a broader discussion that fundamentally changed how common global challenges should be addressed via international cooperation and joint activities.

The international agenda as a result began to **change the focus of its interventions from an economic growth perspective**

to one of economic development, and subsequently, human development.

Parallel to the International Decade for Natural Disaster Reduction, there was growing interest in placing local governments at the center of disaster risk reduction strategies and balancing the physical and engineering approach of these policies with a more inclusive approach and human-centered policies. One milestone in the evolution of the international disaster risk reduction agenda was the 1994 Yokohama World Conference on Disaster Risk Reduction and its Action Plan. The Conference, along with the 1995 Hanshin Awaji earthquake in Kobe, Japan, overcame the dominance of engineering in the disaster risk reduction agenda and highlighted the pressing need for a multidisciplinary approach focusing efforts on local governments.

These two events spurred the international community to unite to include disaster risk reduction and its effects on educational systems as a priority on the international agenda.

Although the concept of school safety was not yet part of the international agenda, except regarding its reactive view of response to emergencies, the first institutional changes in disaster risk reduction policies at the global level were introduced when responsibilities were attributed to national and local governments rather than to relief and rescue organizations.

This would later have a direct effect on the concept of school safety and its conceptualization in the Comprehensive School Safety Framework (CSSF).

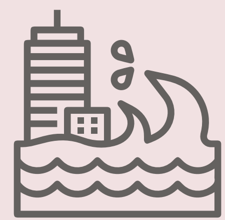
The Yokohama Strategy and Plan of Action for a Safer World for the first time called for and encouraged active community participation to gain a greater understanding of individual and collective perception of development and construction of risk. The Yokohama Strategy and Plan of Action would later incorporate a more humanistic and realistic view of the social construction of risk, and in this regard, urges stakeholders to find effective and efficient means to reduce the impact of hazards of natural origin.

In the early 21st century, following the devastating impacts of the “El Niño Phenomenon”, interest arose in revalidating a new disaster risk reduction strategy, which was to be prepared

On December 26, 2004, a catastrophic tsunami struck countries around the Indian Ocean.

Caused by a 9.1 magnitude earthquake off the Indonesian island of Sumatra, the tsunami was one of the deadliest in history, claiming almost 230,000 lives, displacing 1.6 million persons, and causing material damage estimated at nearly USD 14 billion (https://en.unesco.org/news/ten-years-after-2004-tsunami-indian-ocean-better-prepared-avert-disaster-1).

Most of the lessons learned from this tsunami focused on the **need for populations to be prepared and informed.** The catastrophic effects of this tsunami would undoubtedly influence the preparatory work and results of the Second World Conference on Disaster Reduction.



with the Yokohama Strategy in mind. The World Sustainable Development Summit (WSDS) held in Johannesburg, South Africa in August/September 2002, outlined a set of concrete goals in its Plan of Action so as to increasingly focus attention and capacity on including risk reduction in development policies and processes within the sustainable development agenda.

In 2005, the Second World Conference on Disaster Reduction held in Kobe, Hyogo (Japan) concluded with the revision of the Yokohama Strategy and its Plan of Action. It also identified specific activities intended to ensure the implementation of the relevant provisions of the World Sustainable Development Summit Implementation Plan, especially in the areas of vulnerability, risk assessment, and disaster management. It was also an opportunity to share best practices and lessons learned to further place disaster reduction in the context of achieving sustainable development and identifying gaps and challenges. It highlighted the importance of developing and strengthening existing disaster reduction policies. The Conference ended by adopting the Declaration of Hyogo and the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities.

The Hyogo Framework for Action (2005-2015) marked the adoption of **"resilience"** as an important concept in disaster risk management. The framework, which examined trends in disaster risk management, recognized the need for community approaches and for the first time recognized indigenous knowledge and methodologies as some of the ways, when relevant, to reduce disaster risk worldwide. Adopting the concept of resilience, the framework calls for the autonomy of communities and individuals, and self-organization of the population, placing the responses to situations of crisis in their own capacities. Its discourse thus designates the local setting, i.e., general population and communities, possibly with local government support, as being in charge of implementing solutions in the face of uncertainty and disaster risk, thereby strengthening resilience.

After the World Conference in late 2005, a group was established to promote knowledge and education for reducing disaster risk. The cluster aimed to strengthen networks, create new associations, identify gaps, identify focus areas and advance collectively towards achieving the Hyogo Framework's goals through knowledge and education. In 2006, the cluster was formalized in the Thematic Platform on Knowledge and Education (TPKE), which was recognized within the United Nations International

Strategy for Disaster Reduction (UNISDR, today UNDRR). Since 2006, the TPKE—which consists of relevant UN organisms, international NGOs, and selected regional partners—has made significant contributions to the conceptual development of education and knowledge regarding disaster risk reduction.

In particular, the TPKE developed a strategic framework and guidance tools to help governments and education professionals in disaster risk reduction management, to include risk reduction as part of school curricula, and to develop educational safety initiatives at national and local levels.

Parallel to the Hyogo Framework of Action, the challenges of the Adaptation to Climate Change (ACC) and Disaster Risk Reduction (DRR) often began to be associated with one other and thus, so did the role of education in both, particularly at the institutional level. This association was clearly expressed in the results of the Conference of the Parties in Bali in 2007 (COP13), where countries agreed to improve measures of adaptation, including considerations of disaster reduction strategies and means to address losses and damages associated with the impacts of climate change in developing countries, which are particularly vulnerable to its adverse effects (United Nations, 2008).

In 2007, within the framework of the First Global Platform for Disaster Risk Reduction, which was a consequence of the evolution of DRR and the role of education in development processes, and considering the latent exposure of educational systems worldwide, the international community asked the United Nations organizations and the main world actors to provide methodologies for assessment of school safety.

TPKE members began by conceptualizing School Safety, which as a cross-sectional issue, could be subject to multiple interpretations. Thus, in 2009, TPKE officially launched the Comprehensive School Safety Framework (CSSF) to channel efforts in a clear, unified approach enabling educational sector members to work more effectively and liaise with similar efforts in other sectors.

During the Third World Conference on Disaster Risk Reduction in 2015 in Sendai, Miyagi (Japan), participating countries reiterated their commitment to disaster risk reduction and to

The approach described in the Sendai Framework for anticipatory action to construct resilience suggests evolution of the concept of disaster within the community, moving from the idea of managing disaster to **managing risk.** The Sendai Framework recognizes that **schools should have disaster-resistant structures in accordance with local risks**, at the same time demanding that knowledge and awareness of hazards and risks should form part of school curricula in order to achieve changes in behavior to support disaster risk reduction and increase resilience.

The framework also establishes that disaster risk management policies and practices should be based on an **understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics, and the environment.** It also demands strengthening of disaster-resilient public and private investments, particularly through preventive measures and disaster risk reduction for structural, non-structural and functional components in critical facilities, particularly schools, hospitals and physical infrastructure.

building resilience against disasters. As a result, the importance of investing in disaster risk reduction for resilience was recognized as a priority for action in the Conference's final document: the Sendai Framework for Disaster Risk Reduction 2015-2030 (United Nations, 2015), which includes school safety in all its priorities, goals, and global indicators. Its overall objective is to **strengthen resilience to ensure the expected outcome regarding the reduction of disaster risk and losses.**

In parallel, since 2013, the World Initiative for Safe Schools (WISS) has been evolving. The WISS is a government-led global partnership fostering safe school implementation at the national level. The initiative was developed during the Global Platform for Disaster Risk Reduction and is coordinated by GADRRRES with support from UNDRR. WISS offers technical

Damage to schools caused by disasters can lead not only to children and teachers losing their lives, but also to loss of public investment in social infrastructure and disruptions to education, which in turn may have lifelong implications.

Education plays a crucial role in reducing vulnerability and creating community resilience against disaster risk. It is also essential for empowering people and reducing poverty.

assistance, motivating and supporting governments to develop policies, plans, and programs to enable the creation of safe schools, replicating good practices in other countries and regions through cooperation programs. WISS seeks to motivate and support governments to develop strategies and implement school safety based on the CSSF.

Recognizing that quality education is the basis for improving people's lives and sustainable development, the 2030 Agenda for Sustainable Development adopted in 2015 by the 193 countries represented at the United Nations General Assembly describes in Sustainable Development Goal 4 the commitment to ***"ensure inclusive and equitable quality education and promote lifelong learning opportunities for all."***

Within the framework of the World Education Forum 2015 in South Korea, the Incheon Declaration on Education 2030 was approved to ensure the implementation of Sustainable Development Goal 4 by 2030. The Declaration and its Framework for Action presented a new outlook for education in the upcoming 15 years. Known as the Education 2030 Framework for Action, it calls for more relevant education systems adapted to rapidly changing labor markets, technological advances, urbanization, migration, political instability, environmental degradation, natural hazards and disasters (sic), competition for natural resources, demographic challenges, increasing global unemployment, persistent poverty, widening inequality and expanding threats to peace and safety. The framework reconfirms countries' commitments to ensure that education is maintained in situations of emergency. Its point (25) recognizes (natural – sic) disasters, pandemics and conflicts, and the resulting internal and cross-border displacement as events that can leave entire generations traumatized, uneducated, and unprepared to contribute to socioeconomic recovery of their country or region. The same point recognizes that crises are a major barrier to access to education, stalling and in some cases reversing progress towards the goals of Education For All agreed upon during the last decade. It also recognizes that education in emergency contexts is immediately protective, providing life-saving knowledge and skills and psychosocial support to those affected by crisis, and considers that education also equips children, youth, and adults with the skills to prevent disaster, conflict, and disease for a sustainable future.

Education sector plans and policies should anticipate risks and include measures to respond to the educational needs of children and adults in situations of crisis. They should also promote safety, resilience and social cohesion with the aim of reducing the risks of conflict and “natural disasters” (sic).

The capacity of governments and civil society for disaster risk reduction, peace education, climate change adaptation, and emergency preparedness should be strengthened at all levels to ensure that risk is mitigated and education maintained during all phases, from emergency response to recovery.

Well-coordinated national, regional, and global response systems are needed to prepare for and respond to emergencies, and to “build back” better, toward safer and more equitable education systems.

The framework (point 26) invites countries to institute measures to develop **inclusive, responsive, and resilient education systems to meet the needs of children, youth, and adults in crisis contexts, including internally displaced persons and refugees.** The principles of prevention, preparedness and response, and established international guidelines such as the Inter-Agency Network for Education in Emergencies (INEE https://inee.org/es) Minimum Standards, should guide planning and response.

Although the framework focuses on response to emergencies, it goes on to suggest as indicative strategies (point 57) the need to ensure that education policies, sector plans, and budget planning include risk assessment, preparedness, and response to emergency situations for education, and initiatives that respond to the education needs of children, youth and adults affected by disaster, conflict, displacement, and epidemics, including internal displaced persons and refugees. It also calls on stakeholders to promote a comprehensive approach to making schools resilient to disaster impacts of all sizes. This includes **safer school facilities, school disaster management, and risk reduction and resilience education (CSSF pillars).**

As global frameworks evolved (Figure 1), so did the TPKE, which in 2013 became the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES). In alignment with the WISS, the Sustainable Development Goals, and the new action plans related to DRR and education, GADRRRES again reviewed and updated its mission and objectives in 2016 to refine the work modes needed to support efficient coordination. Among these work modes, the Comprehensive School Safety Framework was reviewed in 2017. This review recognizes the evolution of disaster risk reduction discourse and the role of education in development processes. It is also a global technical document that breaks down the concept of School Safety into three main pillars: Safe Learning Facilities, Disaster Risk Management at Schools, and Sustainability, Adaptation, Risk Reduction and Resilience Education. This technical document has evolved and is presented in this guide with its latest updates.

Since 2015, School Safety as a concept has been at the center of different development agendas, as has the Comprehensive School Safety Framework (CSSF).

The role of school safety and the CSSF was reconfirmed at the UNESCO world conference on Sustainable Development Education in 2019, and in the launching of the 2020-2030 Sustainable Development Education roadmap.

Title: Infrastructure management guide for safe schools in the context of the Comprehensive School Safety Framework.
Legal Deposit:
ISBN:

Publishers: CAF and United Nations Office for Disaster Risk Reduction, Regional Office for the Americas

Authors: Edgar Armando Peña Figueroa and Jair Torres

Collaborators: Dinorah Singer, Educational Agenda Coordinator, CAF;
Luis Carrera, Education Executive, CAF;
Leandro Mesias, Officer, Directorate of Social and Human Development, CAF;
Saskia Carusi, External Relations Officer, UNDRR;
Carlos Uribe, Program Officer, UNDRR.

Graphic design and printing: Estudio Demaro

The digital version of this book is available at: scioteca.caf.com