



Technical Assistance for Increasing Resilience of the Education System to Climate Change in Saint Lucia and Antigua & Barbuda

Framework for Including Disaster Risk Reduction in the School Curriculum

Submitted to

**Climate Technology Centre and Network
United Nations Industrial Development Organization**

By



ECMC

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Background

The Eastern Caribbean region is one of the most disaster-prone areas of the world as over the years, the countries continue to be exposed to a number of natural hazards such as, floods, hurricanes, droughts, fires and landslides that hinder economic growth; compromise the effectiveness of poverty reduction strategies and disrupt their education systems. The long-lasting impact of those hazards is further exacerbated by the effects of climate change, particularly with regard to the increasing intensity and frequency of extreme weather events. For example, St Lucia has experienced six hurricanes during the last 20 years and in 2018, Hurricane Irma caused significant damage to Antigua and Barbuda. Factors such as land degradation; infrastructural development in coastal settlements; high food import bills and reliance on imported fuel also increase the vulnerability of these small island states (SIDS) to climate change.

The impact of natural hazards on our education systems is further compounded by the fact that some schools are used as emergency shelters. In St Lucia, for example, eighty-seven (87) out of a hundred and three (103) public schools are designated emergency shelters. These schools are at the receiving end of disasters both in terms of the damage to their infrastructure and the disruptions in operations which may occur. In this regard, the widespread disruptions to the education system caused by health-related events such as the Corona Virus (COVID 19) pandemic must also be taken into account when considering threats posed to children in particular and to the wider community in general.

Despite the vulnerability of schools to numerous threats, they serve as centers of knowledge transfer and human development. Schools, therefore, play a dual role: as centers of safety in times of disaster, and as the means through which entire communities can increase their capacity to protect themselves from hazardous events. Recognizing that urgent actions must be taken to increase the capacity of the education sector to combat the effects of disasters and climate change, the governments of St Lucia and Antigua and Barbuda undertook a project in 2020 entitled: 'Increasing Resilience of the Education System to Climate Change in Saint Lucia and Antigua & Barbuda'. This project was guided by technical expertise from The Climate Technology Centre and Network/United Nations Framework Convention on Climate Change (CTCN/UNFCCC).

One of the major activities of the project was the development of resilience improvement packages for schools. Apart from options for upgrading, retrofitting or replacement needs to increase schools' resilience and function as shelters, the improvement packages included an educational component to plan the way forward for the inclusion of disaster risk reduction (DRR) instruction in the school curriculum. It is anticipated that the instructional package will add value to school infrastructural improvements by increasing the capacity of schools, and by extension, communities, to take actions that reduce their vulnerability to the effects of hazardous events and climate change.

Further, it should be noted that the initiative to include an instructional package is in sync with the OECS countries' commitment to the United Nations, Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities and the Sendai Framework for Disaster Risk Reduction 2015 – 2030 which together call for the integration of disaster risk reduction and resilience building instruction into national education policies, programmes, and curricula at all levels and spheres of the education system.



1.0 Introduction

It would be inaccurate to presume that the present school curriculum is devoid of any subject matter or learning outcomes related to disaster awareness. A review of the present primary and secondary curriculum revealed that at the primary level, the Science and Social Studies curricula contain learning outcomes which aim to increase students' knowledge of disasters and their impact on the environment and on their lives. In fact, environmental awareness and management are common themes in the Science, Social Studies and Health and Family Life primary curricula.

At the secondary level, environmental and disaster awareness constitute a core theme in the curricula of the cluster of science and social science subjects as well as in the Education for Democratic Citizenship (EDC) instructional programme. In addition, the action-oriented learner outcomes contained in the EDC programmes at both the primary and secondary levels are consistent with those pertaining to disaster-related instruction. (See Appendix 1 for a sample listing of DRR related learner outcomes in the current primary and secondary school curricula).

However, the review of the curricula at both levels indicates that there is no focused, comprehensive, systematic and interdisciplinary approach to teaching children about disaster risk reduction and safety, particularly within the context of climate change. Specifically, the review revealed that while safety and disaster awareness competencies are located across the curriculum, the linkages, especially with regard to climate change, are either implied or thinly articulated.

Firstly, the links between the disaster-related learner outcomes, including climate change, are weak, in that there appears to be little synergy across the content of the various subjects. Secondly, there is inadequate reinforcement, deepening, and refinement of the disaster-related competencies taught across the grade levels. Thus, there is insufficient consolidation of DRR learning as children move up the grade levels. Further, the learning outcomes pertaining to disasters are predominantly knowledge-based. As such, the practical skills and relevant dispositions which children need to acquire if they are to contribute to mitigating the impact of climate change and disasters are lacking.

It is anticipated that the 'Framework for Including DRR in the School Curriculum' will be used to inform plans to include a more defined instructional programme aimed at increasing the capacity of schools to contribute meaningfully to the national disaster resilience building and climate change agenda.



1.1 Key Concepts Related to DRR.

The following are definitions of some key concepts that relate to disaster risk reduction.

Terminology

- **Adaptation:** The adjustment in response to actual or expected climatic stimuli or their effects in order to reduce vulnerability.
- **Capacity:** The combination of all the strengths, attributes, and resources available within a community, society or organization that can be used to achieve agreed goals. Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership, and management. Capacity also may be described as capability.
- **Capacity assessment** is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action.
- **Capacity Development:** The process by which people, organizations, and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.
- **Climate Change:** a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
- **Disaster:** A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.
- **Disaster risks:** The potential disaster losses in lives, health status, livelihoods, assets and services that could occur to a particular community or a society over some specified future time period. The definition of disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses that are often difficult to quantify.
- **Early warning system:** The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.
- **Greenhouse gases:** Gaseous constituents of the atmosphere that absorb and emit radiation of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds.
- **Hazards:** A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihood or services, social and economic disruption or environmental damage (Refer to Appendix 2 for a listing of hazards).
- **Mitigation:** The lessening or limitation of the adverse impacts of hazards and related disasters. The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. For small-island states (SIDS) in particular, mitigation within the context of climate change is primarily about taking adaptive measures to reduce greenhouse gases (GHGs).



- Preparedness: The knowledge and capacities developed by governments, professional response and recovery organizations, communities, and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent, or current hazard events or conditions.
- Prevention: The outright avoidance of adverse impacts of hazards and related disasters. Prevention expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.
- Resilience: The ability of a system, community, or society exposed to hazards to resist, absorb, adapt to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions. In relation to children, resilience is defined as the ability of children, communities, and systems to anticipate, prevent, withstand, adapt to, and recover from stresses and shocks while advancing the rights of every child, with special attention to the most vulnerable and disadvantaged children.
- Risk: The combination of the probability of an event and its negative consequences.
- Risk assessment: A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods, and the environment on which they depend.
- Risk management: The systematic approach and practice of managing uncertainty to minimize potential harm and loss. Shock: A sudden event that affects the vulnerability of a system and its components or the moment where a slow-onset process passes its tipping point and becomes an extreme event.
- Structural elements: The structural elements of a building are those that carry the weight of that building, the people who use it and the things inside. The structural elements should be able to weather the forces of nature. These 'load-bearing' elements include the frame (columns, beams), masonry, and construction. Administrators need to call on experts to check their school's structural ability to withstand hazards like earthquakes, floods; cyclones, tsunamis, or whatever is prone in their area.
- Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- Non-structural elements (onsite and offsite): The non-structural elements of a building are those that do not carry the weight of the building and include windows, doors, stairs, partition walls, pipes and ducts. They also include 'building contents' that users bring with them, such as furniture, appliances, coolers and water tanks. Non-structural elements are those that are either attached to a building or kept in a building. There are other elements that are not actually part of a building – attached to it or placed in it – but within the school campus and are hazardous, such as an open well, no fencing or poor-quality fencing and no hand rails.
- Vulnerability: The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. There are many aspects of vulnerability, arising from various physical, social, economic and environmental factors. Examples may



include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures and disregard for wise environmental management. Vulnerability varies significantly within a community and over time.

Adapted from: (i) The Handbook for a School-based Risk Reduction; (ii) Training of Trainers Module for Teachers on the Creation of a Culture of Safety through Knowledge and Education and (iii) Public awareness and Public Education for Disaster Risk Reduction: Action-oriented key messages for households, schools and (iv) Risk-informed education programming for resilience guidance note.

1.2 Basic Principles Underpinning DRR Education

DRR Education is built on the following principles:

- Child centered – underscoring children’s right to be safe and to have a say in determining the measures they can take to protect themselves.
- Participatory – promoting action-oriented and experiential learning.
- Community-based – developing children’s social consciousness and sense of responsibility for others.
- Connected to children’s real life – ensuring relevant and authentic student engagement.

1.3 Primary Aim of School-Based DRR Education

Disaster risk reduction education aims to develop children’s capacity to participate meaningfully in assessing, planning, implementing, monitoring and evaluating disaster risk reduction programmes in their schools and communities.

1.4 Rationale for Including Disaster Risk Reduction Education in the School Curriculum

Children who are knowledgeable about natural hazard risks can play an important role in keeping members of the community safe at a time of disaster. Including disaster education in the primary and secondary school curricula develops children’s awareness and understanding of the issues impacting the environment and community in which they reside. As children benefit from the knowledge they gain about disasters, they serve as change agents and disseminators of information from school to home and vice versa. The following list outlines the contribution children can make in the effort to build safety and resilience in their families and communities:

- analyzing risk and risk reduction activities;
- designing and implementing DRR interventions at a community level;
- communicating risks and risk management options (especially to parents, adults or those outside the community);
- mobilizing resources and action for community-based resilience;
- building social networks and capital.

Adapted from: Towards a Learning Culture of Safety and Resilience. Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum.



As our islands become increasingly vulnerable to the effects of climate change, the need to prepare children to respond to the potential threats is even more urgent. It means that teaching children about disaster risk reduction can no longer be sporadic or incidental to the goals of the school curriculum.

Since many schools are used as emergency centers, they come under additional pressure when a disaster hits. Unless there is the possibility for dual use of the building during and after the occurrence of a disaster, school is disrupted and students lose instructional time. In addition, the school facilities and resources may be damaged and instructional material lost or rendered unusable. For these reasons, school administrators have an additional incentive to build children's capacity to contribute to disaster mitigation efforts. The risks threatening the safety and wellbeing of children are as follows:

- possible physical harm as a result of the vulnerability of the school's site, structure, contents, or lack of standard operating procedures for emergency response;
- possible psychosocial instability and feelings of insecurity experienced by children and school staff;
- separation from family (especially in the event of an unexpected disaster);
- possible increased risks for already vulnerable children (with disabilities, etc.);
- loss of access to learning facilities;
- damage to school infrastructure and community;
- loss of teaching and learning materials and resources;
- temporary or permanent loss of teaching and administration staff;
- loss of instructional and learning time.

As can be deduced, the risks outlined above are wide ranging and can have far reaching consequences. Principals and teachers must therefore be armed with the appropriate knowledge, methodologies and materials to promote a culture of safety and resilience among children and by extension, their families and communities. Teaching children, in a sustained and deliberate manner, about how they can prepare for and mitigate the impact of disasters including pandemics, is key to helping them increase their own safety and that of others.



2.0 Educational Frameworks Supporting DRR Education

2.1 Education for Sustainable Development (ESD)

Consistent with the seventeen United Nations (17) Sustainable Development Goals 2015 (SDGs), the concept of sustainable development is centered around adopting those behaviours and practices that meet the needs of the present generation without compromising the quality of life of future generations. While all of the goals are interconnected, Goal 4 Target 7, explicitly articulates the educational agenda for sustainable development:

By 2030, ensure that all learners acquire knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.

Through ESD, children are introduced to the numerous challenges they face, including the threats posed by extreme events and climate change in a world which is undergoing continuous and rapid flux. Central to the principles of ESD are the notions of a shared future and global citizenship. Consequently, one of the primary aims of ESD is to empower learners to become informed decision makers and responsible agents who can contribute meaningfully to the global and local agenda for sustainable development; i.e., environmental protection, economic viability, and a just society for present and future generations.

The commonalities between DRR Education and ESD are clearly evident. Both DRR Education and ESD prioritize the development of social responsibility and social activism as key components of quality education. Also, locating disaster risk reduction within the wider context of sustainable development increases relevance and solidifies the link between sustainability and resilience building, thereby providing a deeper and broader understanding of critical subject matter.

(See Appendix 3 for a listing of SDGs and targets related to DRR Education)

2.2 Climate Change Education

Climate change is exacerbating both the frequency and intensity of disasters. The United Nations has determined that greenhouse gas emissions are fifty percent higher (50%) than in 1990 and as a result, global warming is causing long lasting changes to the climate system which, if not mitigated, can result in irreversible consequences and increased vulnerability of children, particularly of those living in small island states. Keeping in mind the goals of sustainable development, it is imperative that the link between climate change and disaster reduction be clearly established and incorporated in the instructional programme of schools in the Caribbean Region.

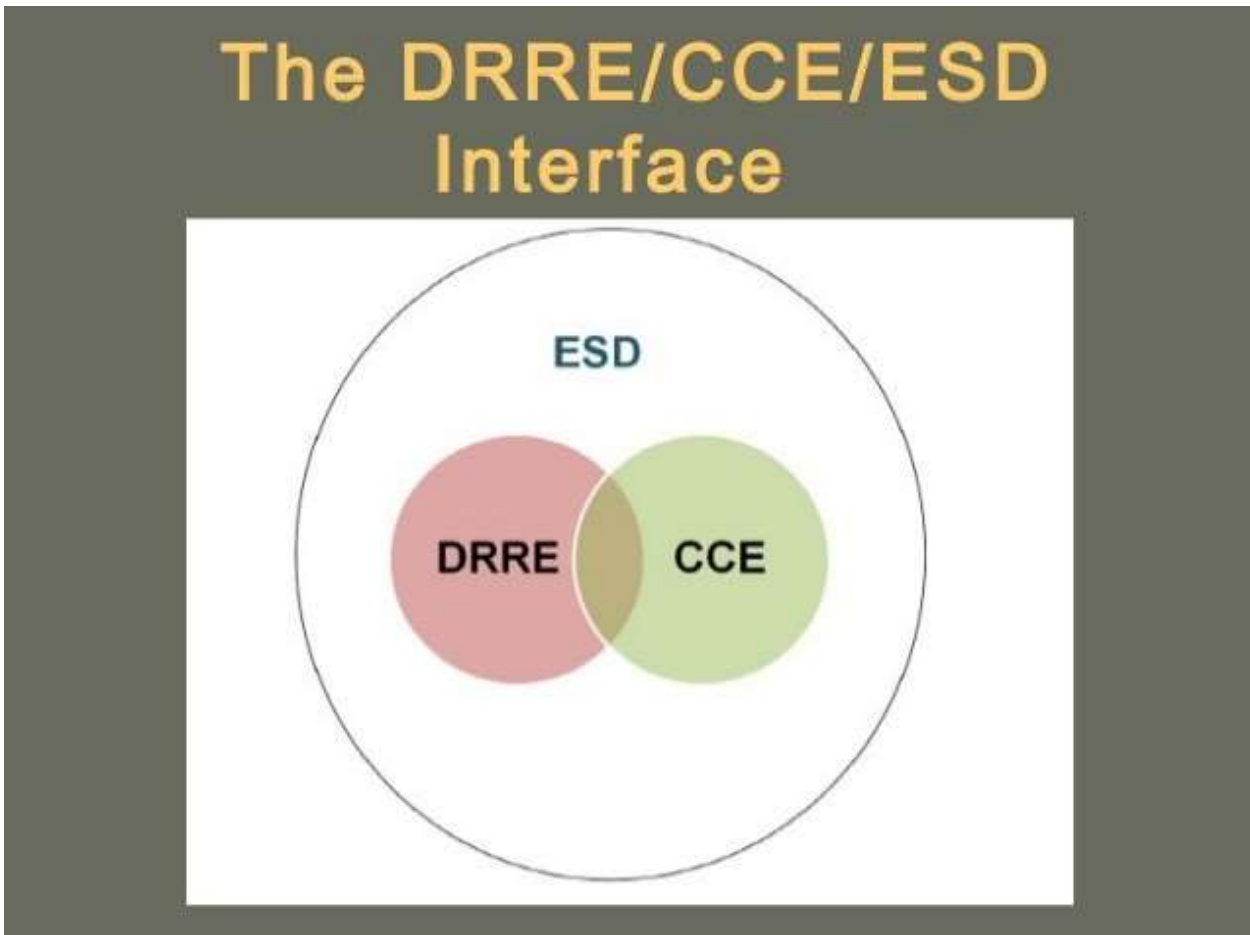
Fundamentally, because of the threats posed by climate change, it is imperative that climate awareness form an integral component of the safety related instruction that children receive. It is for this reason that the UNESCO Climate Change Initiative prioritizes Climate Change Education (CCE) as the means towards preparing the general public, and particularly future generations, to respond to hazardous threats by making the lifestyle changes that are necessary to adapt to the changing local environment and reduce greenhouse gas emissions.

Climate Change Education provides a broad thematic base to raise children's awareness of the technological and man-made factors that increase the threats posed by disasters. Those factors



include: unsustainable consumption practices in energy usage; social and economic inequity and environmental degradation. By emphasizing the urgency of the climate crisis, CCE aims to prompt children to take pre-emptive actions that help them prepare for, adapt and mitigate the attendant effects. Primary among those response measures are the individual and collective actions children and communities can take to address global warming by greening their schools and communities and by reducing their carbon footprint.

The following diagram depicts how DRR Education, ESD, and CCE interface



Extracted from: <https://www.slideshare.net/GRFDavos/integrating-disaster-risk-reduction-into-the-curriculum-a-technical-guidance-tool>

2.3 Child-Centered Education

Every child has the right to be protected and to feel safe from harm or danger primarily because children are among the most vulnerable of our society. A child's rights approach to teaching and learning builds on that premise by prioritizing the safety needs of children and by extension, their families and communities and placing them at the center of instruction.

A child-centered approach to disaster education ensures that children's voices are heard and respected when they express their thoughts, feelings, fears, and aspirations. This focus on children's expressive thoughts and emotions assumes added significance in post disaster periods when their psycho-social well-being is at risk.



Relatedly, child-centered disaster education ensures that children’s contributions are encouraged and valued such that they are granted opportunities to actively contribute to decisions that pertain to their safety. The valuing of children’s voices is necessary to create a non-threatening and emotionally secure learning environment that encourages them to experiment with possible disaster prevention or mitigation solutions.

a) Children with Special Needs:

Importantly, adopting a child-centered approach dictates that all students, including those with special needs, are included in DRR instruction and other school safety activities. By including children with special needs in planning activities, they become empowered to take actions that reduce their vulnerability. Further, an inclusive approach to teaching DRR learner competencies offers children with special needs the opportunity to bring their unique perspective into school safety and risk reduction planning activities in a manner that is responsive to the needs of all children. The concept of children with special needs extends beyond those with physical challenges to include:

- children who have been exposed to ill-treatment, such as physical, emotional or sexual abuse or neglect; children with developmental disabilities, such as blindness or a visual impairment, hearing impairment, mobility impairment, mental illness, brain disorder or injury, chronic illness, drug and/or alcohol dependency or a dual diagnosis of mental illness and substance abuse;
- children with special psychiatric needs;
- children with psychosocial and psychiatric problems that can be exacerbated by the stress of an emergency situation;
- children who experience cultural or ethnic-based disparities or live in geographic isolation;
- children with limited language proficiency,
- children who live in economic disadvantage;
- children with special medical needs;
- others, such as juvenile offenders or homeless youth.

Adapted from Handbook for a School-based Risk Reduction Initiative.

b) Gender Sensitivity

Importantly, a child-centered approach to teaching DRR ensures that gender differences are taken into account when planning instruction and other school-related activities. This approach to planning calls for teachers to be sensitive to specific gender differences and how they can affect children’s levels of vulnerability and safety.

For example, in some societies, socialization norms and traditions result in differences in how boys and girls are raised. In countries where strict gender stereotyping is practised, boys may be encouraged to swim and climb trees while girls may be dissuaded from doing so. These capabilities may help boys save themselves during a flood while girls are more vulnerable and therefore disadvantaged. Also, in times of disaster, it is mainly women and girls who fall victim to domestic or sexual abuse, even in shelters.



On the other hand, because men and older boys are generally physically stronger than their female counterparts, they may be more willing to take heroic actions which could expose them to greater danger and harm. In addition, men are more likely to take health and safety risks which may increase their vulnerability. As data from the COVID-19 pandemic revealed, men were more likely to become ill or spread the disease because fewer men than women went to get tested.

Finally, although women play significant and, sometimes, leading roles in disaster response and preparedness, their work is often undervalued or not recognized at all. Indeed, because the majority of households in the Caribbean are headed by women, the responsibility for family safety lies in their hands. However, the undervaluing of women's work or effort creates the false perception that their contribution to safety, disaster preparedness and response is minimal. This may discourage girls from empowering themselves and participating in disaster-related programmes and activities.

3.0 Contextual Framework for Effective DRR Education

The safety of staff and students is compromised if the school building and facilities are structurally unsound or management systems are weak or non-existent. Therefore, building children's capacity to respond effectively to disasters is of limited value if schools are not meeting critical safety requirements. As such, teaching children about disasters cannot be done in a vacuum or as a purely academic exercise. Moreover, because of the multiplicity of threats to the safety of schools, the response to risk reduction must be comprehensive in scope. Disaster Risk Reduction Education must be viewed as one part of an all-encompassing and coordinated effort to minimize damage to schools and to ensure the safety of learners, staff, families and communities. Such a comprehensive approach to school safety requires the input from persons operating both within and outside of the school setting. In terms of scope, a comprehensive approach to school safety calls for education authorities and school administrators to ensure that school buildings and facilities are safe; appropriate procedures and systems are in place, and staff and students develop the capacity to respond proactively to the threat of disasters.

As conceptualized by the UN, the corresponding Comprehensive School Safety Framework is designed to achieve the following goals:

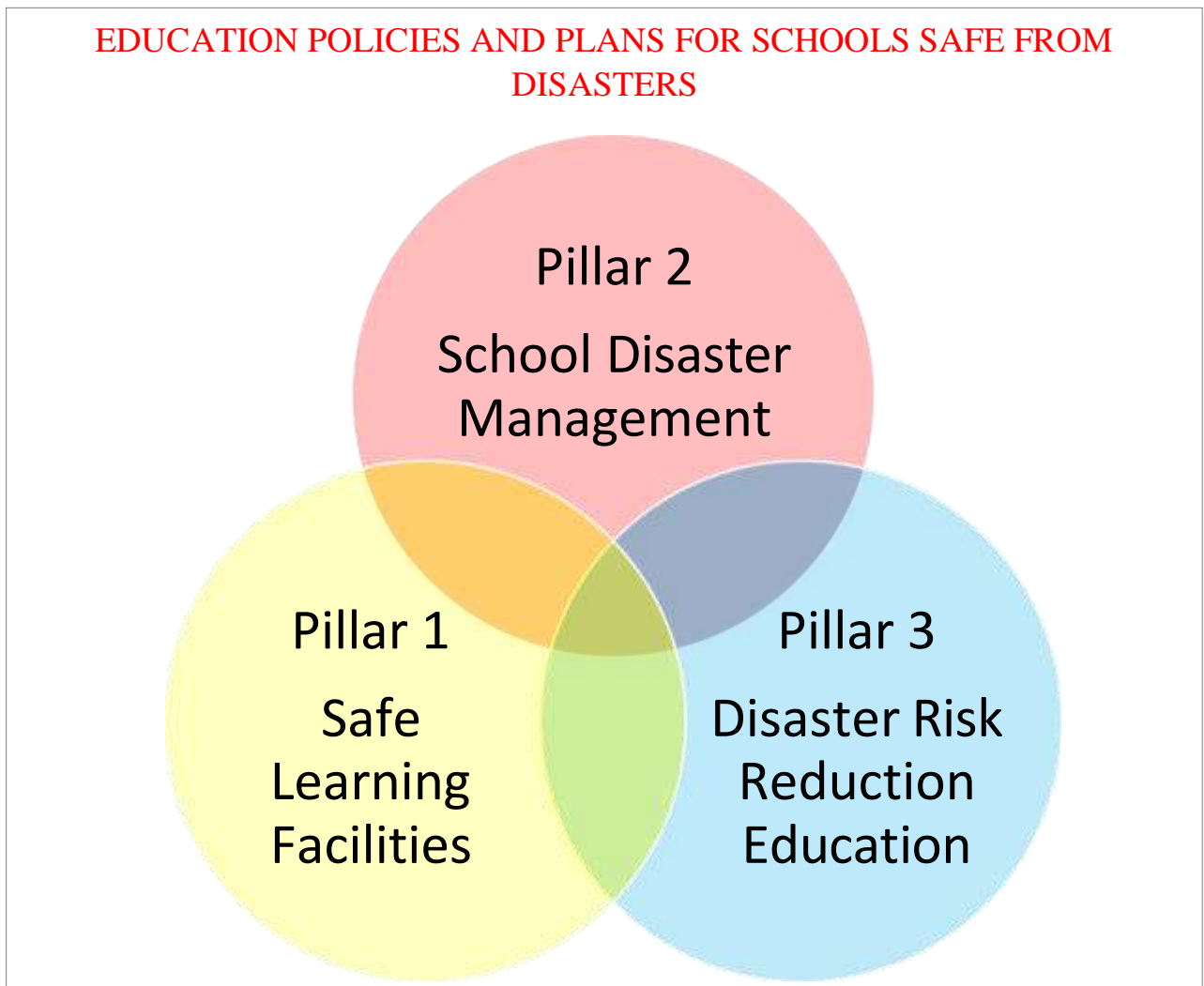
- i. protect learners and education workers from death, injury, and harm in schools;
- ii. plan for educational continuity in the face of expected hazards;
- iii. safeguard education sector investments and;
- iv. strengthen climate-smart disaster resilience through education.

(Save the Children, 2013, p 12)

The framework rests on three (3) inter-dependent pillars: (i) Safe Learning Facilities; (ii) School Disaster Management; and (iii) Disaster Risk Reduction Education.



Comprehensive School Safety Framework



Adapted from: Disaster Risk Reduction in School Curricula: Case Studies from Thirty Countries.

Pillar 1. Safe Learning Facilities:

In order for children and staff to be safe, school buildings and facilities must first be able to withstand potential damage or destruction from disasters and other catastrophic events. The focus on school infrastructure and facilities requires that

both the structural and non-structural elements of schools are soundly in place so that they do not compromise the safety of staff, students or those seeking shelter at the school in times of emergency. This entails, among other actions, establishing the procedures at the governmental and school administration level to assure that every new school meets safety standards. It also entails establishing schedules for maintenance, replacement and retrofitting of the plant and equipment for new and existing schools. Further, in considering safe school facilities, attention must be given to ensuring safe access to schools, (in relation to roads, bridges, traffic and road safety practices).



Pillar 2. School Disaster and Emergency Management:

Secondly, school safety plans that incorporate management systems to guide and oversee the procedures and protocols established to protect children and staff from harm must be firmly in place. Among these are the policies and practices which facilitate school-based disaster risk reduction and preparedness. These policies and practices would include: the implementation of standard operating procedures, drills; continuation of operations plans; development of family safety plans; guidance on the use of schools as emergency centers and the development of tools for accountability. Existing government policies; district school safety plans; district disaster preparedness and response committees; school safety committees and the National Continuation of Operations Plan are also components of Pillar 2 of the Framework.

Pillar 3. Disaster Risk Reduction Education:

DRR Education forms the third pillar of the Comprehensive School Safety Framework. In broad terms, DRR Education is about developing human capacity to reduce the effects of disasters on lives and livelihoods. For children, it means

increasing their understanding of the nature, causes and effects of hazards while equipping them with the requisite competencies to take preemptive actions to prevent or mitigate the impact of disasters. DRR Education also entails fostering attitudes, dispositions and values needed to help children become socially conscious and responsible advocates for change.

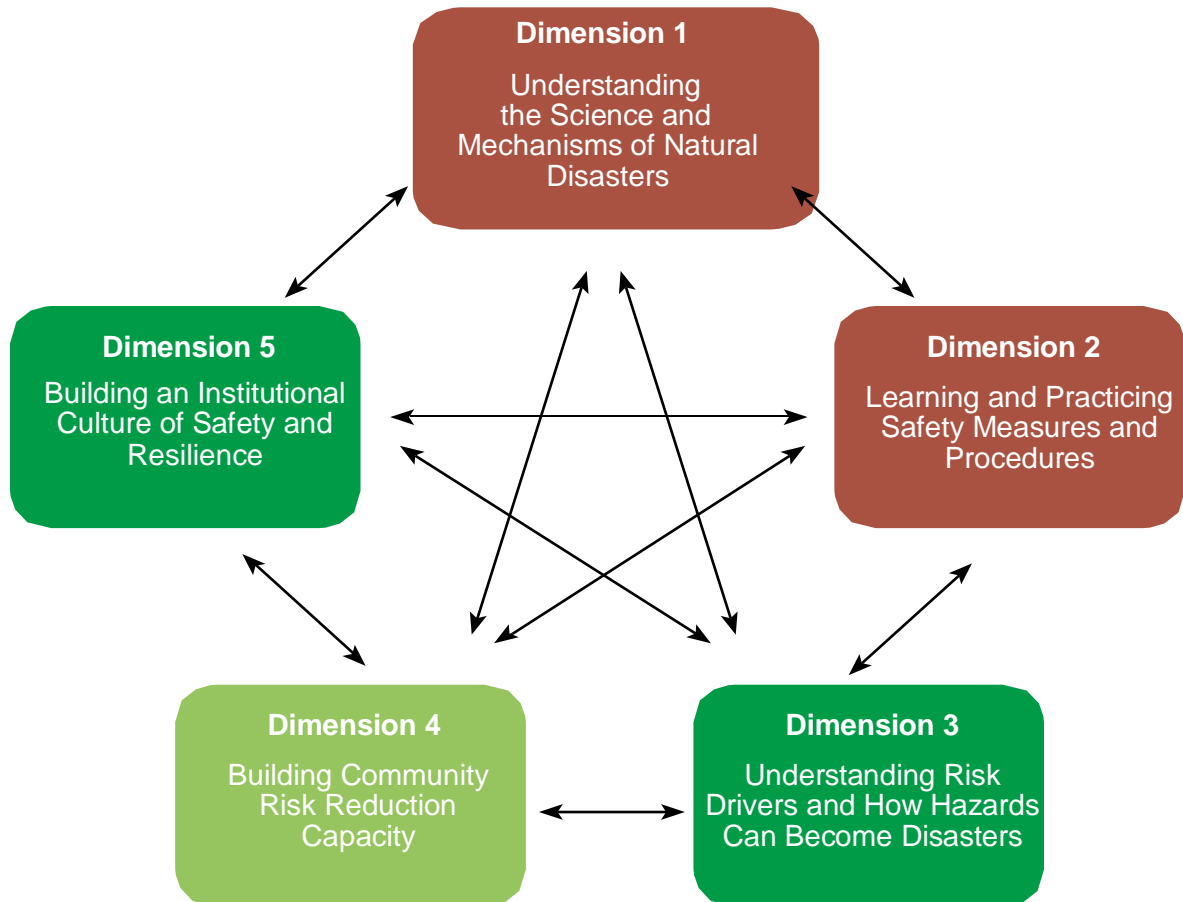
In order for principals and teachers to help children acquire the necessary DRR competencies and behaviours, they must be predisposed to saving the lives of children while they are in their care and to help children save themselves and others. However, in addition to possessing the appropriate disposition, principals and teachers must be equipped with the appropriate information, tools, mechanisms, materials and resources to guide DRR instruction and learning.

4.0 Conceptual Framing of DRR Education

DRR Education consists of five inter-related dimensions. Principals and teachers must be knowledgeable about these five dimensions and give adequate coverage to each of them when planning disaster-related instruction and other school activities. The diagram and explanations which follow outline the five dimensions and their interrelatedness:



The Five Dimensions of DRR Education



Extracted from: Towards A Learning Culture of Safety and Resilience Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum

Dimension 1

Understanding the Science and mechanisms of natural disasters

Dimension 1 call for children to acquire a basic understanding of the science of natural hazards, particularly those common to the Caribbean region. These hazards include, inter alia: hurricanes and other tropical cyclones, drought, tsunamis, earthquakes, and volcanic eruptions. Other hazards such as fires, major epidemics and pandemic diseases are also covered under this dimension. Children must have a firm grasp of the mechanics that explain why these hazards occur; how they develop; their physical and social impacts; the frequency with which they occur; and the trends and patterns in their occurrence over time.



Dimension 2

Learning and Practising Safety Measures and Procedures

The second dimension requires that children develop safety awareness through learning about and practising the safety measures they must take in the event of a disaster, at school, at home or in their community. Instruction must be geared towards helping them become familiar with safety measures and tools such as hazard early warning signs; evacuation and sheltering procedures; drills and simulations; first aid kits and administering basic first aid as well as the post disaster health and safety measures. Instruction geared towards helping children learn and practise safety measures must be treated as a critical component of the formal curriculum and not as supplementary learning.

Dimension 3

Understanding Risk Drivers and how Hazards can Become Disasters.

The focus of the third dimension of DRR Education is on helping children understand that disasters are not inevitable and that hazards become disasters when a society lacks the ability to cope with them. As such, children should be encouraged to examine the accuracy of the term ‘natural’ disaster relative to the impact of human behaviour on the environment. It therefore means that they must first understand the difference between a hazard and a disaster as well as how disaster risk is conceptualized and measured. In this regard, teachers must use developmentally appropriate ways to introduce children to the formula for assessing disaster risk:

$$\text{Disaster Risk} = \frac{\text{Hazard} \times \text{Vulnerability}}{\text{Capacity of Societal Systems}}$$

Given the significance of climate change, children must also be taught the difference in slow and rapid onset disasters. A significant component of children’s learning would require that they understand the local hazardous conditions which pose the greatest level of risk to them and their community. Most importantly, Children must be helped to formulate actions they can take to pro-actively mitigate those risks.

Dimension 4

Building Community Risk Reduction Capacity

Teaching and learning under this dimension require that children acquire and apply their knowledge in ways that are action-oriented and meaningful outside of the classroom or school. For this to happen, children must be able to contribute to genuine resilience building activities that benefit their communities. In order to build community-based resilience, children must learn about and be given opportunities to apply measures of: (i) mitigation (i.e., reducing the effects of disasters, e.g. using recyclable material in new ways) and (ii) adaptation (i.e., making changes in order to cope better with a changed environment, e.g., practising rain water harvesting). Children must also be given the opportunity to disseminate that knowledge to members of their community as part of a deliberate and sustained community outreach programme.

Dimension 5

Building an Institutional Culture of Safety and Resilience

The focus of the fifth dimension of DRR Education is on building a school culture which conveys an ethos of disaster risk reduction, climate awareness, resilience and safety. School culture is what gives



a school its unique identity and conveys how it operates. Because principals play the most influential role in shaping the school culture, they must take the lead in bringing together the school's structural and non-structural elements to create an ethos of safety and resilience throughout the entire school.

School culture embodies the values, traditions, assumptions and beliefs that the adults and students in the school environment share. Thus, together with the competencies children acquire through the formal and informal curricula, principals and teachers must ensure that opportunities are created for children to engage in student led disaster reduction activities and participate in other activities such as: dialoguing with technical personnel on the structural aspects of the school; school safety policy development; school vulnerability assessments and school disaster management and policy planning.

Student engagement can also be facilitated through the establishment of school risk reduction teams, comprised mainly of students and supported by the staff and other relevant persons. The main purpose of the team is to strengthen and sustain the schools' safety and disaster reduction agenda by mobilizing student participation in awareness raising, preparedness and disaster reduction activities. Ultimately, the overall culture of the school should reflect a DRR learning community where both children and adults are working cooperatively to build resilience.

(See Appendix 4 detailing the contribution of stakeholders towards building a school culture)

5.0 Approaches to Include DRR Education in the School Curriculum

There are, generally, two approaches that can be used to include DRR Education in the school curriculum: (1) as a separate disciplined-based subject and (2) integrated with other subjects in the existing curriculum.

a) Disciplined-based/Separate Subject Approach:

This approach typically results in the development of new a stand-alone subject. Introducing DRR into the school curriculum as a separate subject would provide dedicated space on the timetable for wider coverage and more in-depth instruction of the learner competencies. However, the addition of another subject would increase the number of subjects and may prove burdensome to teachers who are already concerned about the overcrowding of the school curriculum.

Secondly, a disciplined-based approach to DRR may de-emphasize the cross-cutting nature of DRR Education resulting in knowledge acquisition that is fragmented.

b) Integrated Approach:

An integrated approach incorporates new subject matter and competencies into one or more existing subjects. One of the main goals of teaching is to help children make real life connections (i.e., with self, family, community, country and the world) to what they are learning. An integrated approach facilitates learning by assisting children in making these connections.

As noted previously, the existing primary and secondary curricula contain some coverage of disaster-related topics and learner outcomes. However, the coverage lacks sufficient depth and cohesion. As inadequate as this coverage may be at present, principals and teachers do not have to rely on the development of a separate stand-alone curriculum to expose children to DRR Education. Existing DRR related curriculum content can be expanded and strengthened to facilitate the integration of learner outcomes into the instruction.



6.0 Approaches to Integrate DRR Education in the School Curriculum.

There are a number of strategies that teachers can use to integrate DRR into their teaching. Four of these approaches will be discussed here:

Strategies to integrate DRR Education

- **Multi-disciplinary** – This approach is also referred to as theme-based teaching and learning. In this approach, teachers organize instruction around a common theme using relevant subject matter from three or more subjects. Using this approach, a teacher can develop disaster-related thematic units of work which may span several weeks. A multi-disciplinary unit of work usually ends with an integrated culminating activity. Integration through the multi-disciplinary approach is more easily facilitated at the primary level where teachers are responsible for teaching all subjects. However, at the secondary level, teachers can work individually or collaboratively to integrate DRR learning into subjects such as the natural sciences, geography, citizenship education, and HFLE.
- **Infusion** – This is a subset of the multidisciplinary approach and the simplest form of integration as it requires less planning. Teachers who use this approach select entry points across the curriculum to introduce or expand relevant subject matter knowledge. Teachers can, for example, infuse disaster-related topics and competencies into carrier subjects such as science, social studies, HFLE as well as other subjects in the curriculum including, language arts, mathematics, art, agriculture and information technology. (The Table in Appendix 5 provides examples of how DRR can be infused in subjects across the curriculum)
- **Trans-disciplinary** – As the name implies, this approach transcends the subject matter of the various disciplines. The lines separating the disciplines are blurred and instruction is organized around students' questions, real-life problems and concerns. This approach is highly recommended for teaching disaster-related learner competencies because it promotes experiential learning. Teachers who use the trans-disciplinary approach engage children in project-based/placed-based/ problem-solving activities designed to provide them with opportunities to apply what they learn in service to their community. As such, the trans-disciplinary approach is an effective tool to promote service learning.
- **Symbiotic Approach** – Through this approach, DRR Education is embedded in an existing learning programme, for example, ESD or Life Skills Education, with which it shares similar qualities. The Symbiotic Approach to integration can be facilitated through the development of DRR modules that connect to, support and enrich facets of the selected subject. Because the two subjects are mutually-reinforcing, teachers using this approach are able to help children make cross-curricular links that deepen their understanding of the competencies addressed in both and other related subjects.

Ultimately, the approach teachers select to integrate disaster-related competencies into their teaching will depend on the specific contexts, needs, and availability of resources. In some instances, it may be useful for teachers to combine approaches as no one approach is totally full-proof.

7.0 Learner Outcomes/Competencies Framing DRR Education

In keeping with the tenets of sound educational programming, a DRR curriculum should be centered around three domains:

- Knowledge
- Skills



- Attitudes/Dispositions and Values

As indicated, a DRR instructional programme must seek to build children’s capacity to become informed, concerned citizens who are inspired to take the necessary steps to protect themselves, their family members and communities. Their ability to do so will depend, in large measure, on the opportunities they will be given to (i) learn about disasters; (ii) develop and hone resilience building skills and (iii) internalize values and attitudes that motivate them to take action.

The following framework is adapted from a UNESCO generated list of generic learner outcomes for DRR Education. The outcomes are all connected to the five domains of DRR Education and collectively serve as a guide for teachers and curriculum developers interested in planning instructional programmes at the school and national levels of the education system.

Generic Learner Outcomes

Broad Objectives	Generic Learner Outcomes
Knowledge and Understanding	
(i) Children are self-aware and aware of others	Children: <ul style="list-style-type: none"> • understand their personal roles and responsibilities in times of hazard and disaster • know their personal needs, concerns, hopes, aspirations, fears and preferred futures concerning hazards, disasters and disaster risk reduction • have an understanding, grounded in practice, of personal attributes and competencies they can each call upon in times of hazard and disaster • know of the special contribution that women in the community can make before, during and after a hazard has struck, the special roles they can play in social organization, and their special needs
(ii) Children know about hazards and disasters	<ul style="list-style-type: none"> • know of the causes and effects of various hazards and disasters: rapid onset (hurricanes, floods, landslides earthquakes, volcanic activity, tsunamis, fires) and slow onset disasters (e.g. drought and climate change) • know of past local disasters • know of locally and regionally specific hazards and potential sources of disaster • know of disaster-vulnerable local spots and populations • know of the seasonality of particular hazards • have knowledge of local, national and global hazard and disaster trends



<p>(iii) Children understand key disaster risk reduction concepts and practices</p>	<ul style="list-style-type: none">• understand key disaster risk reduction concepts (e.g. hazard, disaster, emergency, risk, risk reduction, vulnerability, resilience), their application to specific hazard circumstances, and their concrete applications in the local community• understand that disaster risk multiplies with the intensity of the hazard and the level of environmental and social vulnerability but that it can be reduced according to society’s capacity to cope• understand the idea of a “culture of safety” and how it applies to everyday personal and community life• understand the economies of disaster risk reduction and the cost-effectiveness of forestalling disaster• have a practical understanding of key DRR practices (e.g. hazard mapping and monitoring, early warning, evacuation, forecasting)
<p>(iv) Children know basic safety measures</p>	<ul style="list-style-type: none">• know of precautionary, safety and self-protection measures to be taken before, during and after a disaster by their family, at community level, and at school• know of first aid procedures
<p>(v) Children Know disaster management mechanisms and practices</p>	<ul style="list-style-type: none">• know of local, regional, national and international disaster response infrastructures and mechanisms• know the roles and responsibilities of local, regional and national government, as well as of private and civil society sectors, before, during and after times of disaster• know of locally-valued indigenous disaster risk reduction and disaster coping behaviors and mechanisms
<p>(vi) Children know about the environment and the environmental/human society interrelationship</p>	<ul style="list-style-type: none">• understand the idea of an ecosystem, how humans are actors within ecosystems, and that the reverberations of environmentally unfriendly behaviors will work through the system to harm humans• understand the specifics of how human behaviors and practices can harm the environment• know of environmental issues impacting on their community; their causes, effects and amelioration• know of examples, local through global, of how damage to the environment aggravates the incidence and severity of hazards• understand the meanings and principles of conservation and know of practical conservation measures in their locality• understand the concept of sustainable development and know of concrete and practical ways of living sustainably (including sustainable usage of land and natural resources)• understand the negative interface between sustainable



	development and disaster
(vii) Children know about climate change	<ul style="list-style-type: none"> • understand the difference between “weather” and “climate” • understand the dynamics of climate change • understand that climate change is, in the main, human-induced and can identify patterns of behavior, practices, and lifestyles that are causing the climate to change • understand that climate change is exacerbating the incidence and severity of disasters • know how to apply climate change learning to their own lives and to patterns of behavior in their community
(viii) Children know about differential and disproportionate impacts of hazards on people	<ul style="list-style-type: none"> • understand how and why disasters are more devastating for some communities while others are left relatively unscathed • understand the concept of climate injustice, i.e. that climate change is falling disproportionately on those least responsible, and know and understand proposals for “climate justice” • understand that children are often especially affected by disaster • understand that disasters have differential impacts according to gender and socio-cultural status
(ix) Children know about the conflict/disaster risk reduction interface	<ul style="list-style-type: none"> • understand that personal or direct violence and structural or indirect violence (i.e. violence built into social structures and mores) can both cause and exacerbate disaster • understand that climate change and other looming and imminent hazards can trigger violent conflict, and know of mechanisms and processes, interpersonal through international, for managing conflict and pre-empting violence
(x) Children know about human rights’/child rights’ aspects of disasters	<ul style="list-style-type: none"> • know of internationally agreed human and child rights and their implications for and applications in disaster scenarios • know of rights likely to be curtailed and undermined by disasters, including the rights lost through disaster- and environment-triggered migration • know how to apply a rights and responsibilities lens to disaster risk reduction and mitigation measures and procedures
Skills	
(xi) Children practise skills of information management	<p>Children:</p> <ul style="list-style-type: none"> • have the ability to gather, receive, express and present information on disaster risk reduction • have the ability to classify, organize and sequence gathered information on disaster risk reduction



	<ul style="list-style-type: none">• have the ability to determine the quality, likely accuracy, appropriateness, provenance soundness and priority level of information received on disasters• have the ability to research and devise hazard maps and conduct vulnerability assessment
(xii) Children practise skills of discernment and critical thinking	<ul style="list-style-type: none">• have the ability to discern and interpret signs and signals of impending hazard• have the ability to assess the level of danger presented by impending hazards• have the ability to think creatively and divergently and move outside their established frameworks of reference in response to changing environments and emerging and evolving threats• have the ability to think creatively and laterally so they can identify and facilitate opportunity within crisis• possess the skills to pre-empt and circumvent threats and hazards through effective information management, out of the box thinking and intuition• have the ability to make ethical judgments about present and looming disaster situations• have the ability to decode, deconstruct and learn from spoken, written and visual media information about hazards and disaster
(xiii) Children practise coping, self-protection and self-management skills	<ul style="list-style-type: none">• have the practical skills set required so they can take all necessary measures for personal safety and self-protection before, during and after a disaster• have the skills set required to collaboratively undertake hazard mapping and vulnerability assessment exercises• possess first aid and other health-related skills
(xiv) Children practise communication and interpersonal interaction skills	<ul style="list-style-type: none">• have the ability to communicate warnings of impending hazards clearly and effectively• have the ability to communicate what they have learnt about hazards and disasters to families and members of the community• can communicate messages about risk, risk management options, environmental protection to family and community members, and can receive messages through careful listening• have the ability to engage in dialog and discussion with peers, teachers, family and community members about hazards, disasters and disaster risk reduction, expressing opinions, feelings and



	<p>preferences firmly but constructively and respectfully</p> <ul style="list-style-type: none">• have the ability to communicate about disasters and disaster risk reduction with people from different socio-cultural backgrounds effectively• have the ability to build and maintain the trust required from family, school and community if they are to play a part in disaster risk reduction• have the ability to work collaboratively and cooperatively with others towards reaching disaster risk reduction goals• have the skills to negotiate to mutual satisfaction and manage conflict productively as they work towards disaster risk reduction• have the ability to communicate disaster risk reduction messages using appropriate and creative modes of communication (e.g. brochures, arts, music, song, theatre, puppetry, posters, poems, social media, radio, film)
(xv) Children demonstrate skills of affect and emotional response	<ul style="list-style-type: none">• have the ability to work through and express their emotional responses to threats and disaster openly and effectively• have the ability to listen to, receive and empathize with the emotions felt and expressed by others• have the ability to empathize with those threatened by hazard and harmed by disaster
(xvi) Children apply skills of action	<ul style="list-style-type: none">• have the ability to make informed action decisions based on data available, observation, dialogue and discussion and intuition• have the ability to work alone and/or with others in school and community contexts to effect change towards sound disaster risk reduction practices and behaviors• have the ability to campaign for sounder disaster risk reduction measures using electronic and traditional media, drama performance, art, petitioning, lobbying and engaging in public forums where ideas are shaped and shared and decisions made• have the necessary skills set to implement precautionary and safety measures against hazards in the classroom, school, home and community• have the necessary skills set to be able to assist victims and the vulnerable in case of disaster (e.g. first aid skills, rescue skills)• have the skills set necessary for participating in early warning and evacuation drills• have the skills set necessary for emergency response in times of hazard (e.g. light search, swimming, evacuation and creating an emergency shelter)



<p>(xvii) Children apply systemic skills</p>	<ul style="list-style-type: none"> ● have the ability to perceive relationally and identify interrelationships and interactions within ecosystems and between nature and human society, between eco-systemic wellbeing (or its absence) and community wellbeing and development (or their absence) ● have the ability to identify patterns, commonalities and relationships between different hazards and risks as well as different prevention and response mechanisms ● have the ability to identify patterns, commonalities and relationships between different hazards and risks as well as different prevention and response mechanisms.
<p>Values and Attitudes</p>	
<p>(xviii) Children demonstrate altruism</p>	<p>Children:</p> <ul style="list-style-type: none"> ● recognize the intrinsic value of nature and wish to help protect their natural environment ● recognize the intrinsic value of human life and of their community and wish to help protect all from harm ● show a willingness to be involved in voluntary community activity ● value and want to protect the special place where they live ● value the global community of humankind and planet earth
<p>(xix) Children demonstrate respect</p>	<ul style="list-style-type: none"> ● respect the diversity of perspective and opinion on disaster risk reduction in their community ● respect the special contribution that all can make to disaster risk reduction ● respect the rights of others in their concern for disaster risk reduction
<p>(xx) children demonstrate compassion, care and empathy</p>	<ul style="list-style-type: none"> ● feel care and compassion for those threatened or affected by disaster ● commit to an ethic of mutual help in times of hazard and disaster ● approach disaster risk reduction from an ethic of caring for future generations
<p>(xxi) Children demonstrate confidence and caution</p>	<ul style="list-style-type: none"> ● appreciate the need to follow safety rules and procedures on any occasion ● apply a precautionary principle and risk awareness in their daily decision making and behaviors ● feel confident, empowered and resilient enough to cope with disasters



(xxii) Children demonstrate responsibility	<ul style="list-style-type: none">● embrace a sense of responsibility to help protect themselves, their peers, their family and community from hazard and disaster● embrace a “responsibility of distance” to those living far away who are beset with threat and disaster
(xxiii) Children demonstrate commitment to fairness, justice and solidarity	<ul style="list-style-type: none">● commit to fairness and justice as the basis on which relationships between individuals, groups and societies should be organized● commit to a stance of solidarity with those who are affected by natural disasters in their own and other societies
(xxiv) Children demonstrate harmony with the environment	<ul style="list-style-type: none">● embrace an ethic of care, kindness, and respectfulness towards living things● acknowledge the specialness, beauty and fragility of nature and embrace an ethic of environmental protection and conservation.

Towards a Learning Culture of Safety and Resilience. Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum.



8.0 Best Practices for Teaching DRR Competencies to Children

Whether DRR Education is incorporated into the curriculum as a separate subject or integrated within the existing curriculum, the mode of instruction that teachers adopt must be carefully considered. Firstly, teachers' mode of teaching should be consistent with and reflect the child-centered principles of participatory learning. In order to do so, teachers must avoid the traditional transmission mode of teaching where children are seen as passive recipients of knowledge. Instead, teachers should employ a more facilitative approach consistent with child-centered teaching and learning.

The following outlines some of the practices that teachers could adopt to facilitate child-centered DRR learning in the classroom:

- Create a secure, inclusive and non-threatening classroom climate;
- Value the contributions and experiences of everybody in class;
- Encourage students to express their ideas and feelings freely;
- Model the values and attitudes you want to teach students (respect, openness, compassion, participation);
- Resist the temptation to give students an excess of information before they have had the opportunity to share and discuss what they already know;
- Avoid giving the perception that there is only one expected outcome or one right answer in each task;
- Be flexible if the lesson moves in a different direction than you planned it as long as it's productive;
- Use an array of different methods, changing from one activity to another; Every student has their own learning style/range of multiple intelligences so one method may work better for some students than for others. Mixing methods not only makes your class more interesting but also creates space to accommodate the different learning styles in your class;
- Ensure that you regularly switch up the size of the groups (pairs, small groups, larger groups, whole class) so that students work with as many classmates as possible in different group setting;
- Show students that you are curious and are also still a learner who is open to new inputs, ideas and skills;
- Debrief activities effectively to maximize learning and use the debriefing to encourage further learning and action outside the classroom.

Extracted from: Towards a Learning Culture on Safety and Resilience: Technical Guidance for Integrating DRR into the School Curriculum.

Secondly, since building children's capacity to engage in practical, placed-based mitigation and resilience activities is at the core of DRR Education teachers' mode of instruction should support experiential learning.

A note on experiential learning:

As the name implies, experiential learning is learning through experience. It is learning by doing and thinking: i.e., both hands on and reflective. The act of reflection is critical as it allows time and space for learners to mull over, analyze and evaluate their experiences before determining how to apply the knowledge gained in new and creative ways. There are a number of ways that teachers can engage children in experiential learning:



- (i) **Surrogate Experiential Learning:** it may not always be possible to engage children in actual classroom experiences, for example, volcanic eruption disaster preparedness activities. In such cases, teachers can engage children in surrogate experiential learning which mimics actual situations. Examples of surrogate experiential learning include: the use of models; simulation gaming; fictional or documentary filmic experiences and drama (role play, sketches, puppetry).
- (ii) **Field Experiential Learning:** taking children out of the classroom and into the field where they can acquire as well as apply their knowledge and skills is a powerful strategy to help build their capacity to contribute to disaster risk reduction. Children can go on field visits to disaster preparedness and emergency services or conduct hazard mapping and vulnerability assessments in school and in the community.
- (iii) **Digital learning:** with the increasing use of technology in the classroom, children can have the benefit of going on virtual field trips. The ‘before’, ‘during’ and ‘after’ activities that accompany virtual field trips are designed to help children think through and apply the knowledge gained to address disaster-related problems and concerns.

The table below offers examples of experiential learning activities suitable for teaching learner competencies related to the five dimensions of DRR Education.

DRR Dimension	Experiential Activity
Understanding the Science and mechanisms of natural disasters	<ul style="list-style-type: none">– conducting interviews with residents about past hazards and disasters;– conducting interviews with meteorological officers– going on transect walks with local hazard experts– looking at local hazard maps
Learning and Practising Safety Measures and Procedures	<ul style="list-style-type: none">– engaging in mock drills and simulations;– participating in first aid training– developing a family preparedness disaster plan– packaging a family safety preparedness bag
Understanding Risk Drivers and how Hazards can Become Disasters.	<ul style="list-style-type: none">– Conducting hazard risk assessments to complete:<ul style="list-style-type: none">• hazard ranking charts• seasonal calendars• disaster history charts• disaster causes and impacts sheets• class, school, community risk maps



Building Community Risk Reduction Capacity	<ul style="list-style-type: none">– producing and placing warning signs in school and community– planting trees or mangroves– engaging in community clean up campaigns– conducting group (e.g. the elderly) or community vulnerability and capacity investigations
Building an Institutional Culture of Safety and Resilience	<ul style="list-style-type: none">– making DRR related presentations to peers, teachers and community members– painting murals that promote safety and resilience building on walls in and around the school and the community– participating in student led discussions– planning and conducting student led assemblies on DRR related issues

Other appropriate learning modalities that support effective DRR instruction include the following:

- **Affective learning:** Children’s psycho-social development is often overlooked when instruction is being planned. Fundamentally, children must be encouraged to share their feelings about threats posed by disasters and other catastrophic events. In addition, nurturing children’s social consciousness and empathy is a critical component of DRR learning. Children must be nurtured to care for and take action to promote, not only their safety but that of others who may be more vulnerable than they are. Even if children in a particular community have never experienced a disaster, it is important that they too are nurtured to develop empathy for those who have been victims of disasters. Therefore, time and space must be allowed for children to participate in empathetic exercises that provoke a sense of social responsibility and advocacy.
- **Imaginal learning:** encouraging children to use their imagination to visualize possible disaster-related scenarios is a powerful strategy to help them develop awareness of critical issues. Through visualization, children can be encouraged to imagine past, present, and future hazards and to build on the ideas that come to mind. For example, children could be led to imagine what took place during past disasters and the lessons which could be learnt from them. Conversely, they could visualize what a positive or negative future would look like and the pre-emptive steps they can take to secure the former and mitigate the latter. They could also be led through mental walks to become familiar with the steps they could take to keep safe during a disaster or catastrophic event.
- **Interactive learning:** an essential aspect of DRR Education seeks to develop children’s capacity to work collaboratively. In this regard, teachers must plan activities that engage children in meaningful face-to-face interactions with peers and with others. Brainstorming of ideas is one such activity which provides rich opportunity for children to interface with one another in a non-threatening and empowering way. Other examples of interactive learning include: participating in interactive multi-media presentations, pair, peer, and whole class discussions as well as in discussions with teachers, community members, or visiting technical and DRR experts.



- **Inquiry Learning:** in order to solve problems children must be able to inquire into phenomena and formulate their own solutions. Thus, children’s natural inclination to discover new things should be inspired and facilitated through investigation and discovery. Teachers must create opportunities for children to research and study relevant DRR subject matter and to apply their knowledge in authentic ways. Internet research and research that taps into indigenous knowledge present opportunities for children to inquire into DRR issues, at the global and local levels.
- **Action Learning:** in keeping with the trans-disciplinary approach, action learning engages children in activities that go beyond subject disciplines and which focus instead on community-based interventions and partnerships. Through action learning, children can actively test their recommendations to reduce risk in their communities and participate in hazard awareness and risk reduction campaigns such as tree planting and community risk mapping exercises. Service learning is an example of action learning.
- **Somatic and Expressive Learning:** With the ever-increasing vulnerabilities of children, the real impact that disasters can have on their emotional growth and well-being must be given prime consideration. As such, it is incumbent upon principals and teachers to give due care and attention to the emotional needs of children.

Children’s capacity to build emotional resilience is essential in order to cope before, during and after a disaster. Somatic and expressive activities that explore body movement and emotional expression help empower children to manage their feelings and behaviours. Examples of somatic and expressive learning activities include artistic expression through dance and movement. This form of learning is particularly effective for bodily/kinesthetic learners.

- **Project-based learning:** the power of Project Based Learning (PBL) lies in its ability to offer relevant experiential learning. PBL provides learners with the scope to acquire deeper knowledge as they inquire into real world problems and issues; answer complex questions and develop practical solutions to effect change at the local and global levels. Since it is children and not teachers who take the lead in determining the purpose of the inquiry, children are presented with opportunities to develop a sense of agency and the advocacy skills needed to become change agents. Through PBL, children are able to acquire and demonstrate the competencies and dispositions necessary to contribute meaningfully to disaster risk reduction beyond the school setting. These competencies and dispositions are as follows:
 - Critical thinking
 - Creativity
 - Research
 - Communication
 - Presentation
 - Project management
 - Collaboration and group skills
 - Self-confidence
 - Curiosity
 - Empowerment
 - Perseverance

A note on Project-Based learning (PBL) for DRR education.

It is important to note that Project Based Learning is not the same as doing projects. Generally, projects are



driven by teachers; usually tied to academic standards focused on product and can be done alone or at home. The end result of a project is usually confined to display in the classroom.

In contrast, project-based learning is driven by student inquiry; connected to solving real life problems; focused on both process and product and requires collaborative effort with peers and support from teachers. The result of project-based activities can be shared beyond the classroom with a wider audience.

Localizing DRR Instruction:

Irrespective of the modalities teachers use to deliver DRR instruction, their efforts would be in vain if children are not interested in what is being taught. This is because the knowledge children receive through exposure to any curriculum must be relevant to their lives. For children to respond positively to learning about disasters and climate change, instruction must be localized. Therefore, it is imperative that principals and teachers tune children into the immediate and potential hazards to which they are exposed. In order to do so, principals and teachers must themselves be informed of those threats and how they can be mitigated.

Teachers must seek to incorporate local realities, concerns and needs when planning DRR instruction. They must also combine indigenous knowledge, for example, local prevention measures as well as tried and tested coping skills with the learning contained in textbooks and other educational material. Tapping into indigenous knowledge contributes to building a culture of safety and resilience through the school/community links that are forged.

School location is an important factor to consider when localizing DRR instruction because it tunes children into the hazards which may be of greatest threat to them. By way of example, children whose schools (or homes) are located in close proximity to the sea may be more interested in learning about storm surge than about landslides or bomb scares which may occur elsewhere. Consequently, engaging children in risk assessment and vulnerability mapping exercises are useful strategies to capture and maintain their interest.

Promoting DRR learning through the Informal curriculum: Co and Extra-Curricular Activities.

Even in instances where there is no explicit DRR instructional programme included in the formal school curriculum, schools can introduce DRR learning through the informal curriculum. Indeed, the informal curriculum plays a pivotal role in preparing children to participate in meaningful school and community-based risk reduction and resilience building initiatives.

Broadly speaking, the informal curriculum may be conceptualized as consisting of learning experiences which occur outside the timetabled curriculum: at lunchtime, after school or during vacation. As such, both co and extra-curricular activities may be considered to be part of the informal curriculum. The distinction between co and extra-curricular activities has become blurred and the meanings may change depending on the context. For purposes of this guide, the terms co and extra-curricular activities are used to refer to those experiences that complement and supplement students' acquisition of DRR related learning outcomes outside of the formal, written curriculum.

Since so much of DRR Education is community focused, co and extra-curricular activities should give children the opportunity to engage meaningfully and authentically with a wide range of persons operating outside of the school setting. These would include: community members, members of service groups and conservation organizations (National Trust, Archeological and Historical Society) persons attached to disaster preparedness/response institutions (the Red Cross, NEMO, the Fire and Emergency Service, the ST John's Ambulance) technical and other experts (engineers, architects, meteorologists, experienced farmers, fishermen, medical workers, etc.).



Public Awareness and key messages

Non-formal public education is a core component of the disaster preparedness, risk reduction and resilient building work which has to be undertaken with communities. As disseminators of knowledge, children have a leading role to play in transmitting

key information to their communities. Co and extra-curricular activities are powerful tools that teachers can use to help children disseminate information and make real life connections outside of the regular timetable and beyond the classroom. Naturally, because these activities are not bound by the regular class schedule, children gain more time to participate in experiences that help nurture and hone the advocacy skills critical for active citizenship.

As recommended by the Red Cross (2018) sound school and public awareness messaging should aim to build the capacity of children and communities to: (i) assess risks and plan activities to recognize and respond to hazards; (ii) take mitigation measures that make the built and natural environments safer and establish early warning systems and (iii) develop response capacity by learning appropriate skills. The role of the teacher, in this regard, is to facilitate the development of the skills children need to craft high quality messages. (See Appendix 6 for characteristics of effective DRR messaging)

The following are examples of co and extra-curricular activities and which can be adopted to help children disseminate key DRR messages in schools and in the community:

- disseminating written material: posters, flyers, leaflets, signage;
- displaying student made or sourced educational material: storybooks, puzzles, comic books, games, documentary videos;
- organizing and or participating in drawing, writing or art competitions;
- granting school safety awards: e.g. safety badges, trophies, certificates;
- bestowing safety commendations to community members;
- installing school safety monitors and school and community safety/disaster risk reduction ambassadors;
- establishing after school clubs: school safety, environmental;
- conducting disaster drills and simulations;
- facilitating student led assemblies;
- hosting school/community disaster reduction fairs and open days consisting of: cultural performances, exhibitions, lectures and talks, poetry, dance, music, improvisation, short skits, puppetry, role play, display of student work (art, informational books, essays, risk and capacity maps, models, etc.);
- organizing and or participating in community service projects;
- using information technology: social media postings (SMS), creating short videos, web pages and activities such as games, online quizzes;
- television programmes;
- using mascots (fictitious character, animal or object);
- creating Slogans;



- co-opting positive role models and celebrity spokesperson(s): (e.g., frontline volunteers, respected elders, community members, beloved teachers, sports figures, etc.).

Special Event Days:

One co-curricular strategy which can be used by teachers, working alone or as part of a whole school effort, is the development of DRR themes and activities around a designated ‘Special Event Day’; for example, teachers can collaborate to implement a special ‘Disaster Reduction Day’ or a ‘School Safety Day’ which may coincide with the day a disaster occurred in the country. Because of the ease of implementation, ‘Special Event Days’ can be used to introduce critical DRR related knowledge, skills and behaviours in a non-threatening, engaging way. This strategy can be equally effective if teachers capitalize on internationally recognized days. Such days include, but are not limited to the following:

- International Mother Earth Day;
- International Day for Disaster Reduction;
- World Water Day;
- World Tsunami Awareness Day;
- International Day for the Conservation of the Mangrove Ecosystem;
- World Day to Combat Desertification and Drought;
- World Ocean’s Day;
- World Environment Day;
- International Day for Biodiversity;
- International Day of Forests;
- International Day of the Tropics;
- International Day of Clean Air for Blue Skies;
- International Day for the Preservation of the Ozone Layer;
- World Habitat Day;
- World Soil Day;
- International Day of Epidemic Preparedness.

DRR ‘Special Events Days’ should not be viewed as ‘nice to have’ stand-alone activities or as substitutes for teaching. They must be carefully planned to ensure that the activities are connected to the formal curriculum by reinforcing, supporting, refining and consolidating children’s acquisition of the DRR competencies that are being taught during class time. Links to the curriculum should also be facilitated by engaging children in the planning and preparation stages before the day and in reflective sessions following the special day. The time allowed for children to reflect on the day’s activities is key as it presents them with the opportunity to analyze and connect their experiences to what they are learning in the formal curriculum.

9.0 Best Strategies for Assessing Children’s Acquisition of DRR Competencies.

Since effective DRR instruction promotes child-centered and experiential, learning, the assessment strategies used to measure and track students’ progress must be aligned with those principles. In order to do so, teachers need to assess (i) what children know or can do, (ii) their preferred mode of internalizing information and the processes they employ while learning. It means there must be dual focus on product and process to allow for children’s progress to be monitored over time and in a variety of ways. In keeping with the goals of child centered DRR instruction, the strategies teachers use to assess students should be:



- i. both formative and summative in nature;
- ii. authentic and connected to real life;
- iii. inclusive of all of the domains: knowledge, skills, attitudes;
- iv. reflexive in order to improve both teaching and learning;
- v. non-threatening so that children welcome assessment as a natural part of the learning process;
- vi. flexible to allow for self and peer evaluation;
- vii. differentiated to align with children’s learning style/multiple intelligences.

The following are examples of formative and summative forms of assessment which can be used to monitor and gauge children’s acquisition of DRR competencies, attitudes, and behaviours:

- Written tests (including multiple choice questions)
- Written compositions
- Report writing Oral questioning Quizzes Simulations
- Observation checklists Questionnaires Journals/logs/diaries
- Artifacts: drawing, painting, cartoon strips, posters, flyers Puzzles
- Construction of models/gadgets
- Demonstrations: singing, role-play, dramatizations Group work
- Self/peer evaluations Portfolios

10.0 Putting it all together

The Framework for including DRR in the School Curriculum should be used as a guide to plan the way forward for DRR curriculum development and instruction in St Lucia and Antigua and Barbuda. Planning the way forward entails decisions being taken at the national education policy level and at the level of the school/classroom. The following basic questions could be used by policy directors, technocrats and school principals/teaching staff to inform their decision-making process:

1. Current Status – Where are we now?
2. The Goal – Where are we going?
3. The Path – How will we get there?
4. Reality Checks – How will we monitor our progress?

As indicated previously, DRR Education can be included in the school curriculum through a number of approaches:

- i. as a separate/stand-alone subject;
- ii. in the form of modules embedded in a similar subject or;
- iii. integrated across existing curriculum subjects.

Generally, disciplined-based curriculum development coincides with the national five-year cycle of curriculum review and revision. It is a longer and more intensive process, requiring direction and input from central Government. Outside of the five-year curriculum review process, new knowledge can be incorporated into the curriculum through the development of modules. The decision to undertake a formal process of module development also rests with central government. Although the process of module development is not as intensive as disciplined-based curriculum development, it certainly requires



resource input and coordination at the national education level. More specifically, both discipline and modular-based curriculum development require the skilled leadership of curriculum specialists. (See Appendix 7 for a full listing of the steps to be followed for DRR curriculum and module development)

It would be pedagogically sound and pragmatic to embed DRR Education in a subject such as EDC with which it shares common characteristics. As a practical matter, because EDC modules already exist, DRR related modules would be more easily incorporated into that subject.

At the school level, DRR education can be introduced to children through the integration of new and/or expanded DRR learner competencies in regular classroom instruction and informally through co and extra-curricular activities. This would require teachers to decide on the method or methods they would use to integrate the new and expanded DRR content and learner competencies. Integration of DRR learning will also entail teachers making use of co and extra-curricular activities to complement teaching and learning.

Planning DRR Education at the National and School Level

Level	Decision	Options	Product	Lead Actors
National Education Sector	Formal curriculum development	1: Developing DRR as a Stand Alone subject. 2: Embedding DRR in a related subject (EDC or HFLE)	1. DRR Curriculum Guide 2. DRR Modules	<ul style="list-style-type: none"> • Policy directors • Curriculum specialists • Education Officers
School/Community	Integration of DRR competencies in classroom instruction	1. Infusion 2. Thematic 3. Project Based 4. Combination of approaches <ul style="list-style-type: none"> • Co and extra-curricular activities 	1. Integrated lesson plans 2. Plans for co and extra-curricular activities	<ul style="list-style-type: none"> • Principals • Teachers • Education Officers



11.0 Critical Next Steps

11.1 National Policy Level

If the decision, at the national policy level, is to include DRR Education in the formal school curriculum, two major tasks must be accomplished irrespective of the approach adopted for inclusion:

- i. the full development of relevant and context specific DRR learner competencies and;
- ii. the sequencing of content and learner outcomes to match the developmental stage of children across grade levels.

The following table outlines examples of the sequencing of DRR learner outcomes.

Domain: Knowledge	
Broad Objective: Children know about hazards and disasters.	
Generic Learner Outcome: Children know of past local disasters	
Grade Level	Example of Learning Outcomes Progression
K-2	Children understand when and where natural hazards/disasters took place previously in their community
3-4	Children have a basic understanding of causes and effects of previous natural hazards/disasters in their community
5-6	Children understand patterns/trends of past local disasters in terms of locations, durations, season, and impacts
7-11	Children understand impacts of past local disasters from socio-economic, gender, human/child rights perspectives

Domain: Skills	
Broad Objective: Children practise communication and interpersonal interaction skills.	
Generic Learner Outcome: Learners have the ability to communicate disaster risk reduction messages using appropriate and creative modes of communication (e.g. brochures, arts, music, song, theatre, puppetry, posters, poems, social media, radio, film) Ages	
Grade Level	Example of Learning Outcomes Progression
K-2	Children are able to express basic DRR messages learned at school in drawings and posters for class/school displays
3-4	Children are able to create DRR posters and brochures on specific natural hazards most relevant to their own community for display and distribution in the community
5-6	Children are able to pass on DRR messages using performing arts (such as puppetry, theatre, songs, poetry) to younger children
7-11	Children are able to plan, prepare and implement DRR campaigns using multiple communication modes of their choice (including social media, radio, film) for a wider audience



Domain: Attitudes/Values	
Broad Objective: Children demonstrate responsibility	
Generic Learner Outcome: Children embrace a sense of responsibility to help protect themselves, their peers, their family and community from hazard and disaster	
Grade Level	Example of Learning Outcomes Progression
K-2	Children have positive self-worth and confidence to be responsible
3-4	Children become aware of their responsibility to care for each other in times of hazard
5-6	Children show willingness to take action to keep themselves and others close to them safe from potential hazards
7-11	Children demonstrate firm commitment to taking action to keep their community safe from potential hazards

(Grades 7 – 11 correspond to Forms 1 – 5)

Adapted from: Towards A Learning Culture of Safety and Resilience Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum

The scope and sequence charts that emerge from the sequencing activity are necessary to track the level of cohesion among DRR learner outcomes across grade levels. Most importantly, they are useful in helping teachers develop appropriate and effective lesson plans. In order for this to be achieved, learner outcomes should be sequenced in a manner that both supports the cumulative reinforcement of DRR competencies across grade levels and facilitates the vertical integration of the learning programme.

11.2 School Level

Once a school has decided to integrate DRR learner competencies in the instructional programme, a number of activities must be taken to prepare for instruction. Three of the most critical activities are highlighted below:

Activity 1: Becoming familiar with local hazards and associated risks.

In preparing to teach DRR, principals and teachers must become knowledgeable about specific hazards and the threats they pose to the school and surrounding community. This knowledge can be gained by principals and teachers providing answers to the following questions:

- What are the main hazards that your community or society is exposed to?
- What disasters has your community or society had to cope with?
- What were the social, economic and political effects of those disasters?
- What are your community/society's main vulnerabilities?
- Which groups and persons might be particularly vulnerable — what are they vulnerable to and what are the sources of their vulnerability?
- What capacities, expertise and resources do you have to help minimize disaster risk?



- What capacities, expertise and resources can you find in your community/society that can help minimize disaster risk?
- How can you use those capacities, expertise and resources for teaching DRR

Extracted from: A Teacher's Guide to Disaster Risk Reduction. Stay Safe and Be Prepared. UNESCO, Paris, 2014. P. 8

Activity 2: Becoming familiar with DRR learner competencies

Principals and teachers must also be very knowledgeable about the learner competencies that frame DRR Education in order to plan instruction. First of all, teachers must be aware of the DRR related competencies (though limited) that are contained in the existing school curriculum and include them in their planning. If scope and sequence charts are not yet available, teachers can refer to The Generic Learner Outcomes to develop lessons plans. This may require teachers working together to select learner outcomes they wish to prioritize for their schools.

Activity 3: Identifying/developing instructional material

Teachers would need to carry out an audit of the existing DRR teaching/learning material available for use. At present, the DRR related content contained in school textbooks does not adequately cover the breadth and depth of DRR learner outcomes. As indicated, there is readily available DRR educational material which can be adapted for local use. Material such as PSAs can be sourced from local NGOs for example: the Red Cross, NEMO, the Fire Service, The National Trust, community health centers and through open source online searches.

See Appendix 8 for lists of questions which can be used to guide the inclusion of DRR Education and related practices at the national and school levels.



APPENDIX 1

The following table contains a sample of DRR related learner outcomes in the current school curriculum.

Primary Level

Subject	Indicative Learner Outcomes
Science	<ul style="list-style-type: none">● observe changes in weather patterns over a specified period;● explain what is weather;● state the differences between weather and climate;● discuss how pollutants affect people’s activities;● discuss how people’s activities may result in air and water pollution;● discuss ways of reducing air and water pollution;● identify marine pollutants;● suggest ways of preventing/reducing marine pollution;● describe ways of preventing soil erosion;● list ways in which people’s activities may affect the water supply;● discuss the effects of water shortage on the environment and human activity;● identify ways in which water may be conserved;● give simple definition of drought and discuss its effect;● define the term, environmental destruction● appreciate that the environment needs to be protected;● define conservation;● recognize the role that humans play in protecting or destroying ecosystems;● distinguish between actions that harm a habitat/the environment from those that preserve it;● investigate the factors that result in environmental destruction;● identify some ways in which environmental destruction may be prevented.● explain the importance of mangrove swamps, rainforests and ponds;● explain environmental conservation action that may be taken in everyday life;● investigate conservation needs of their country (focus on terrestrial);● demonstrate involvement in environmental protection;● describe the role of recycling and other conservation methods in maintaining balance in the environment;



	<ul style="list-style-type: none">● state the safety measures to be carried out during an earthquake and demonstrate each;● identify volcanic activity as a natural process in the environment;● explain how volcanoes are formed;● investigate the effect of wave action on the environment (e.g. beach, coral reefs).
Social Studies	<ul style="list-style-type: none">● give the reasons why it is important to use our resources wisely;● suggest reasons for conserving the natural resources;● identify and define the different elements of the weather;● illustrate how the elements of weather are measured and recorded, and give a weather report;● indicate what human-made changes have been made to the local environment;● classify and explain the local weather features;● give examples of how the weather affects the lives of people;● propose a course of action for preserving the natural environment;● explain some of the major changes that have taken place in the landscape, population, and economic activities in the Caribbean since its early settlement;● classify the major resources of the Caribbean region;● identify examples of how science and technology have changed the physical environment and affected our resources;● explain how current events in the world affect the safety and well-being of people in the Caribbean;● plan and participate in a class or group project aimed at reducing wastage or correcting the misuse of a local natural resource;● describe a course of action for individuals and for the family in preparing for the various natural disasters that affect the region.



HFLE	<ul style="list-style-type: none">● identify ways in which some communicable diseases are spread;● list ways to prevent the spread of communicable diseases; list personal practices that can prevent the spread of communicable diseases;● identify measures for reducing risks to diseases in the home/school/community;● show curiosity to explore various environments;● predict the effects of the absence of some environmental features on health;● identify personal safety risks/hazards in the school/on the road and at home;● identify some negative factors in the environment, home/school/community that impact on our health, e.g. litter, garbage odours and smells, loud noises vehicle exhaust and old cars.; suggest strategies for collectively improving the environment of the school/home community;● practice behaviours to prevent injuries to self and others;● make a personal safety plan for home school etc.;● set goals for promoting and maintaining a healthy home/school environment;● list desirable behaviours they would practice in various situations for protection from injuries;● identify ways in which environmental damage affects health,e.g. improper garbage disposal, deforestation, use of chemicals, air, water, noise pollution, etc.;● list ways in which we can protect the environment;● list ways of utilizing the environment without degrading it;● assess their school and home environments for health and safety hazards;● list which personal behaviours and lifestyles affect the environment, e.g. poor garbage disposal, use of aerosol sprays, air pollution, pesticides, insecticides;● suggest strategies for collectively improving the environment of the school, home, community;● predict the short and long-term consequences of poor practices on the environment;● describe problems that arise in communities as a result of poor environmental management;● develop and implement a plan of action to improve an environmental problem affecting the health of your school or community;● identify environmental problems in your community that require help and support from outside agencies.
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EDC	<ul style="list-style-type: none">● suggest ways to improve the school environment;● discuss the consequences of unplanned development on crown lands;● be involved in activities which will portray themselves as good citizens;● explain what it means to influence a citizen;● identify the types of decisions that citizens make;● identify examples of negative and positive choices made;● define the concept of “Basic Needs”;● show an awareness of the rules which protect them while they use the school grounds;● identify the rights that they have while on the school grounds;● demonstrate ways of being a good citizen in their school, home and community;● state ways by which we can be responsible for safety in our community;● identify the people in the community who can help us;● state the ways in which these people help us;● identify ways in which they can provide service in the community;● display/demonstrate/exhibit ways in which they can make a difference by being actively engaged in proposed activities;● define ‘rights’/‘responsibilities’ (what are rights and responsibilities?);● identify their rights as children;● identify their responsibilities (home, classroom, school and wider community);● display/demonstrate/ exhibit ways in which they can make a difference by being actively engaged in proposed activities;● define ‘rights’/‘responsibilities’ (what are rights and responsibilities?);● identify their rights as children;● identify their responsibilities (home, classroom, school and wider community);● define the concept of “change”;● discuss how to prepare for change;● differentiate between positive and negative ways to cope with change;● examine how we can utilize the media effectively;● identify the major issues facing their communities;● describe the changes they wish to see in their communities;● identify activities taking place in the community that influence positive change;● identify groups which actively participate and influence change in the community;● identify young persons who help to bring about positive changes in their communities;● define the terms community service, volunteerism, volunteer;● identify volunteer groups and individuals in the community;● explain the benefits of giving service/volunteering in the community;● suggest ways in which young persons can help make positive changes in their communities;● define the terms community service, volunteerism, volunteer;
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- identify volunteer groups and individuals in the community;
- explain the benefits of giving service/volunteering in the community;
- suggest ways in which young persons can help make positive changes in their communities;
- suggest how individuals can help to care for special citizens;
- examine how well your school, community and government cater to the needs of special citizens;
- discuss how special citizens are affected when they are neglected by family and community;
- outline the role of the family members in caring for special citizens;
- outline the role of community members in caring for special citizens;
- suggest how young people can show care and concern for special citizens in their school or the community;
- define the concept of a global citizen;
- discuss our rights as citizens of the world;
- discuss our responsibilities as global citizens;
- identify the countries and organizations that significantly influence world events.



Secondary Level

Subject	Indicative Learner Outcomes
Social Studies	<ul style="list-style-type: none">● appreciate the human and natural diversity of the region and how this can be harnessed to promote sustainable development through regional integration;● explain and use correctly concepts and terms associated with human and physical resources: development, environment, conservation, energy, renewable resource, natural resource, non-renewable resource, infrastructure, food security, pollution, conservation, global warming, greenhouse effect; environmental impact and assessment.
Geography	<ul style="list-style-type: none">● appreciate their role as individuals in the sustainable use of the environment;● recognise the national and regional responsibilities for the sustainable use of the environment;● describe the “greenhouse effect”;● describe the ways in which human activities influence climate change;● explain the importance of coral reefs in the Caribbean;● explain the importance of mangrove wetlands in the Caribbean;● distinguish between a natural hazard and a natural disaster;● describe the impact of earthquakes, hurricanes, volcanoes, landslides and flooding on the physical and human environments in the Caribbean;● explain the responses of individuals, national and regional agencies in the Caribbean to reduce the effects of the natural hazards and disasters;● compare the consequences of climate change in the Caribbean with those in EITHER the United States of America (USA) OR the United Kingdom (UK);
Biology	<ul style="list-style-type: none">● suggest means by which the environment could be conserved and restored;● describe the impact of human activities on natural resources;● explain the negative impact of human activity on the environment: pollution by agricultural practices such as use of chemical fertilizers; products of industrialization and improper garbage disposal;● assess the implications of pollution of marine and wetland environments: impact on the health of ecosystems, aesthetic and economic benefits to small island states● discuss current and future trends regarding climate change: increase in greenhouse gases, rising global temperatures, rising sea levels and ocean acidification; the vulnerability of small island states to climate change.



Integrated Science	<ul style="list-style-type: none">• describe the characteristics of a cyclonic storm: (a) Seasons. (b) Weather patterns. (c) Hurricanes;• describe tidal waves: Brief description and the causes - underwater landslides, volcanoes and earthquakes, tsunami;• explain the causes of the different types of volcanic eruptions; the ecological consequences of volcanoes in the long and short- term. Include Kick-em-Jenny underwater volcano off the coast of Grenada;• discuss the relationship between earthquakes and volcanoes; and the function of the seismograph The Richter scale. Significance of the numbers on the Richter scale;• identify the various types of fossil fuels;• discuss problems associated with the use of fossil fuels; Fossil fuels as a non-renewable resource; environmental effects of acid rain, global warming.
HFLE	<ul style="list-style-type: none">• demonstrate an understanding of the inter-relationships of a sustainable natural environment;• analyse the interaction of basic environmental systems and implications for environmental risks;• critically analyse community policies and actions as these relate to a sustainable environment;• value the importance of a sustainable environment;• critically analyse the key factors in priority environmental health issues in the school and community setting (e.g., malaria risk increased in the school/community by an infestation of the carrying mosquito in a mangrove swamp);• appreciate the importance of individuals, schools, communities, and nations to advocate for a healthy environment.
EDC	<ul style="list-style-type: none">• define rights and responsibility;• identify their rights as children;• exercise their rights in given situations;• understand that rights come with responsibilities;• recognize that there are persons in the society who need special care;• recognize that they have a role and responsibility in caring for these persons;• understand the value of the environment to our survival;• understand the physical environment significantly determines our lifestyle;• appreciate the impact that the forces of nature can have on human life;• identify behaviours that harm the environment;• understand how our actions negatively impact the environment;• demonstrate an appreciation for the fact that the environment can be destroyed;• recognize that protecting the environment is everyone’s responsibility;• recognize that they can help in small ways to protect the environment;• demonstrate through their actions an appreciation for the environment.



APPENDIX 2

Classification of Hazards and Examples

A

Classification	Hazards
Climatological	<ul style="list-style-type: none">– drought– extreme heat/heatwave
Biological	<ul style="list-style-type: none">– major epidemic diseases (avian influenza, SARS)– potential pandemic diseases (viral, bacterial, fungal and prion diseases: cholera, zika)– plant or animal contagion– insect and other animal plagues and infestations
Geophysical	<ul style="list-style-type: none">– earthquakes– landslides– tsunamis– volcanic eruptions– earthquakes
Meteorological	<ul style="list-style-type: none">– tropical cyclones– hurricanes
Hydrological	<ul style="list-style-type: none">– floods– storm surge
Technological and Man-Made	<ul style="list-style-type: none">– radiological emergencies (sources: radiography machines, radioactive material for use in the industry)– chemical emergencies
Non technological and Man-Made	<ul style="list-style-type: none">– wildfires– forest fires



B

Hazards Within School Buildings	Hazards Outside the School Building
<ul style="list-style-type: none">– narrow dimensions of halls or stairways (in case of a mass evacuation);– smoke in the hallway (from a science laboratory);– doors and windows opening inward;– glass panes;– electrical wires;– tall bookcases or cabinets not properly secured to a wall;– areas where flammable liquids are stored (science laboratory, school kitchen, storeroom);– other movable, falling or blocking items.	<ul style="list-style-type: none">– power lines;– trees;– parapets, roof tiles, galvanized sheets, glass;– concrete walls along routes to buildings;– rivers, sea coast, main roads, market place, inflammable goods storehouse, a bus stand,– open well, open drains, inferior- quality fencing;– lack of ramps or handrails.

Adapted from: Public awareness and public education for disaster risk reduction: Action-oriented key messages for households and schools

**APPENDIX 3**

Some of the Sustainable Development Goals (SDGs) and indicative targets
2015- 2030 pertaining to DRR Education

Goals	Indicative Targets
Goal 1 No Poverty	End poverty in all its forms everywhere.
Goal 2 Zero Hunger	Ensure sustainable food production systems and implement resilient agricultural practices.
Goal 3 Good health and Wellbeing	Ensure healthy lives and promote well-being.
Goal 4 Quality Education	Ensure inclusive and equitable quality education opportunities for all.
Goal 6	Ensure availability and sustainable management of water and sanitation for all.
Goal 9 Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
Goal 11 Sustainable Cities and Communities	Make cities and human settlements inclusive, safe, resilient and sustainable.
Goal 12 Responsible Consumption and Production	Ensure sustainable consumption and production patterns.
Goal 13 Climate Action	Take urgent action to combat climate change and its impacts.
Goal 14 Life Below Water	Sustainably manage and protect marine and coastal ecosystems.
Life on Land	Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services.
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build
Peace, Justice and Strong Institutions	effective, accountable and inclusive institutions at all levels.
Goal 17 Partnerships	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Adapted from: Comprehensive School Safety, A global framework in support of The Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector and The Worldwide Initiative for Safe Schools March 2017; P.



APPENDIX 4

Roles of Stakeholders in Building a Culture of School Safety and Resilience.

Stakeholders	Roles and Responsibilities
School Principal	<ul style="list-style-type: none">• Provides overall leadership in embedding school safety initiatives in the formal curriculum, school campus, community and institutional spheres and for maximizing the level of connectedness between all spheres• Encourages the participation of all students and all staff (including ancillary staff) members in curriculum linked DRR school-based and community-based learning opportunities• Knows and applies all relevant policies on school safety and DRR to overall school management and operation• Oversees special DRR days to educate the whole school (and wider) community and makes sure the experiences are linked with formal learning• Leads the school community in creating and communicating a collective vision for whole school DRR learning• Creates spaces for open dialogue on DRR, ensuring sufficient opportunities for student participation in the school and local community• Mobilizes resources and promotes collaboration between the school and local community in order to achieve the school's intended DRR goals• Monitors whole school DRR learning (of students, teachers and non-teaching staff)• Oversee the establishment of a School Safety Committee tasked with developing and updating a school safety plan, making sure that the plan covers each of the spheres of curriculum, campus, community and culture• Oversees the establishment of a school risk reduction team comprised mainly of students responsible for awareness raising, and planning preparedness and mitigation activities.• Sensitizes the PTA, school council, school board on the importance of linking DRR formal learning with safe school facilities, safe school management, and an overall school culture of safety and resilience• Engages actively and builds constructive partnerships with community organizations, district councils and local leaders to support student DRR learning



Teachers	<ul style="list-style-type: none"> ● Familiarize themselves with the main hazards that the school and community are exposed to. ● Integrate DRR and climate awareness in their lessons and ensure that whole school and local community issues and initiatives are embedded in the curriculum ● Facilitate DRR learning both inside and outside of the classroom by using a mixture of pedagogical modalities ● Create a supportive learning environment where learners feel comfortable and motivated to participate and share knowledge and experience ● Attend to children’s emotional and psycho-social needs, particularly after a disaster or catastrophic event. ● Hold regular meetings with parents to exchange views on student achievement relating to DRR learning inside and outside of the classroom ● Continuously improve their own teaching through their own reflection and learning and by participating in DRR related professional development activities
Ancillary Staff	<ul style="list-style-type: none"> ● Support school administration safety, disaster reduction and climate awareness initiatives ● Participate in school safety and disaster related training
Students	<ul style="list-style-type: none"> ● Participate fully in DRR learning inside and outside of the classroom ● Participate actively in school and community DRR forums and initiatives ● Disseminate DRR messages to peers, family and local community members ● Observe school safety measures ● Adopt the role of change agents and change advocates ● Volunteer to participate in safety and resilience building activities ● Teach others about safe and protective rules and behaviours
Parent Teacher Association	<ul style="list-style-type: none"> ● Serves as a link between school and community ● Provides support for DRR learning activities in school ● Ensures that the school has a school safety policy that is linked to formal learning, implemented, monitored and periodically reviewed ● Works with school and community to develop community, family and neighbourhood safety and disaster preparedness plans ● Identifies skills, expertise and resources that reside in the community ● Works closely with communities and students to ● ensure that out-of-school children and youth participate in DRR learning



Community	<ul style="list-style-type: none">• Supports and participate in school safety and resilience building activities• Engages in environmental protection, disaster preparedness and mitigation activities (water and solid waste management, tree planting, community garden, clearing of drains and gutters etc.)• Collaborates with schools to establish early warning signs and to mark evacuation routes, emergency centers in the community• Provides material and skills support for school safety and community disaster preparedness and response activities• Engages in safety and disaster preparedness and response training (first aid• Shares experiences with other communities
Curriculum Officers	<ul style="list-style-type: none">• Coordinate the development of DRR Curriculum at the national level• Guide teachers' efforts to integrate DRR in the curriculum• Monitor the implementation of the DRR Curriculum• Assist teachers in sourcing and or developing DRR educational material and resources• Organize and or support teacher training sessions on DRR instruction
School Safety Officer	<ul style="list-style-type: none">• Provides technical support to develop school safety plans• Monitors and assesses the implementation of school safety plans• Fosters links between schools and disaster preparedness and emergency agencies• Works with school safety committee to support curricular, co and extra-curricular DRR activities in schools and community• Ensures school management are aware of national school safety policies and procedures
District Education Officer	<ul style="list-style-type: none">• Provides schools with resource materials and latest information to enable them to understand and facilitate DRR learning• Provides schools with technical assistance to monitor and evaluate their whole school DRR learning• Assists school principals by providing technical support through consultation, training and capacity building on promoting whole school DRR learning



	<ul style="list-style-type: none">• Ensures that school management knows and understands policies and practice relating to safe school and DRR practices• Ensures the establishment of school safety committees tasked with developing and updating a school safety plan, making sure that the plan covers each of the spheres of curriculum, campus, community and culture• Coordinates the supervision and inspection of all aspects of DRR learning at school, including the dovetailing of curriculum and campus, community and whole-school DRR initiatives• Harmonizes and share DRR learning initiatives taking place in the district• Develops inter-school/inter-community DRR links and dialogue
NGOs, Disaster support service groups, etc.	<ul style="list-style-type: none">• Provide material and other resources to support school safety, disaster preparedness and response activities• Contribute to the development of school safety policies and plans• Provide safety, climate awareness and disaster• risk reduction training

Adapted from: Towards A Learning Culture of Safety and Resilience Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum UNESCO, UNICEF Pari



APPENDIX 5

Examples of DRR Infusion across the Curriculum

Subject	Examples
Arts (Visual and Performing)	<ul style="list-style-type: none">• Creating murals, collages, posters and displays on hazard and disaster themes• Composing and performing song, dance, marionette shows and plays to build community awareness of DRR• Using mime and body sculpture to convey the nature of hazards and possible human responses
Language and Literature	<ul style="list-style-type: none">• Reading and discussing stories, fables, poems and news articles on hazards and disasters• Composing essays, poems and stories in response to disaster-related print and visual stimulus material• Letter writing to local newspapers and bodies on local DRR issues
Science and Technology	<ul style="list-style-type: none">• Learning about mechanisms of climatological and geo-seismic natural phenomena• Model building and experimentation to understand basic principles of disaster-resistant construction• Learning about the effects of human activities on ecosystems
Biology	<ul style="list-style-type: none">• Learning how a healthy ecosystem, such as forest or mangrove swamp, can protect a community from hazards such as landslides and tsunamis• Examining the role of wetlands in absorbing excessive rainwater and preventing floods downstream• Reviewing how local deforestation has increased hazards in communities
Mathematics	<ul style="list-style-type: none">• Working on measurement aspects of home and school safety• Graphing natural hazard data (e.g., total number of people affected and total economic cost of cyclones in different time periods)• Extrapolating disaster trends based on recent statistics



History	<ul style="list-style-type: none">• Exploring impacts of natural hazards and climate change periods on past civilizations• Studying past major national/community disasters and identifying lessons to be drawn• Researching indigenous/traditional DRR wisdom/practice and considering its present applicability
Geography	<ul style="list-style-type: none">• Re-drawing national maps to show the effects of different degrees of rise in sea level on coastlines• Studying impacts of natural disasters on urban and rural communities• Looking at changes in land use as a means of resilience building and as a source of hazard
Social Science/ Studies	<ul style="list-style-type: none">• Reviewing disaster vulnerability through human rights and child rights lenses• Interviewing local community members on their hazard/disaster perspectives, memories and past practices• Field visits to examine local disaster support services
Civics/Citizenship	<ul style="list-style-type: none">• Meeting with locally elected officials to find out about disaster preparedness strategies and structures• Undertaking DRR advocacy projects in the local community• Engagement in community resilience-building initiatives
Health/Wellbeing Education	<ul style="list-style-type: none">• Learning basic first aid• Learning safety practices and procedures to follow with the onset of a hazard• Learning about potential post-disaster health threats
Agriculture	<ul style="list-style-type: none">• Studying and practicing adaptation of crop growing cultures in response to increasingly dry/wet climatic conditions• Learning about food preservation and food security• Learning about soil degradation
Vocational/Technical Education	<ul style="list-style-type: none">• Studying and practicing adaptation through tree and/or mangrove planting projects• Constructing equipment to measure rainfall in school area• Learning principles of disaster-resistant design and construction
Life Skills	<ul style="list-style-type: none">• Holding a debate competition on disaster related topics• Simulating international climate change negotiations• Preparing a family disaster plan

Adapted from: Towards a Learning Culture of Safety and Resilience. Technical Guidance for Integrating Disaster Risk Reduction in the School Curriculum.



APPENDIX 6

Characteristics of Effective Messages

Characteristic	Details
Well Crafted	<p>Messages that:</p> <ul style="list-style-type: none"> • are clear, consistent and answer the following questions: <ul style="list-style-type: none"> – What is the hazard? – What damage can it do? – How has the hazard affected us previously? – How will we be affected at home, at work or at school? – Can I do anything to avert these effects? – How complicated is it? – How much does it cost? – Has anyone I know done it? – What do I need to begin? • use everyday language. <ul style="list-style-type: none"> – non-technical terminology – widely used terms and concepts • promote effective action. <ul style="list-style-type: none"> – the consequences of inaction – the effectiveness of proactive behaviour – specific, accurate and feasible examples
Powerful Imagery	<ul style="list-style-type: none"> • use visual imagery: <ul style="list-style-type: none"> – illustrations of positive behaviour – photos, graphics, animation or video, – pictures of people – avoid images of death and destruction – Visual Organizers/ design and layout – colour coding (e.g., traffic-light colours: red = stop or danger; yellow = slow or take care; and green = go or safe. – Symbols/icons that a widely understood (e.g. cross = wrong; a tick = right) – Maps with recognizable landmarks, political boundaries, main transportation routes with clear keys using iconic colours (blue for water; green for vegetation; brown for soil, etc.)
Engaging Compelling Tone	<ul style="list-style-type: none"> • attractive and interactive educational material • engaging, fun, humorous, surprising or musical



Adapted/Localized Content (in cases of existing copyright free material)	<ul style="list-style-type: none">• context specific (relate to local hazards, risk reduction practices, experiences, expertise and culture)• targeted to audience (language, age, religion, occupation)
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Adapted from: Public awareness and public education for disaster risk reduction: a guide.



APPENDIX 7

Steps in DRR Curriculum and Module development

A. DRR Separate/Stand Alone Curriculum

Step 1: Establish a team of curriculum writers comprising teachers and content experts.

Step 2: Carry out an audit of the existing school curriculum to ascertain where disaster reduction, climate adaptation, mitigation and safety issues are already being addressed, how they can be introduced or enhanced.

Step 3: Develop learner outcomes to be taught through the new curriculum. To facilitate this step, the Generic Learner Outcomes list should be expanded and customized to cover country-specific and contextual issues.

Step 4: Using the expanded/customized list of learner outcomes, develop scope and sequence charts for each grade level. (The scope and sequence charts that emerge from this activity are necessary to track the level of cohesion among DRR learner outcomes across grade levels. Learner outcomes should be sequenced in a manner that supports the cumulative reinforcement of DRR competencies across grade levels).

Step 5: Include recommendations for appropriate teaching/learning activities.

Step 6: Develop supporting age appropriate stimulus material. The development of material to support teaching and learning of DRR competencies. (It may be useful to review best practices in material development that have been successfully employed in other regional countries such as Cuba where a reference guide that contains information pertaining to disasters and climate change has been developed for students from kindergarten to post-secondary level).

Step 7: Include recommendations for effective assessment practices. Step 8: Develop and implement training for teachers.

Step 9: Solicit feedback from stakeholders, including panels of experienced teachers and content experts on the curriculum materials, and redraft where appropriate.

B. DRR Module Development

Step 1: Establish a team of module writers comprising teachers and content experts.

Step 2: Identify key concepts, issues from the list of learner outcomes to determine themes and the particular grade levels in which they will be taught.

Step 3: Determine the broad and specific outcomes for each module. Step 4: Select the content for students.

Step 5: Determine the teaching and learning activities that would facilitate the achievement of the outcomes. If necessary, develop teaching and learning material such as information sheets.

Step 6: Develop assessment strategies.

Step 7: Review and revise to ensure that module outcomes are being achieved.



APPENDIX 8

Checklists of Key Features of Effective DRR Curriculum Implementation and Practices.

A. DRR Curriculum

- Are students receiving cumulative exposure to disaster risk reduction through the primary and secondary grade levels?
- Are students within each grade level receiving reinforced exposure to disaster risk reduction across the curriculum?
- Does the disaster risk reduction curriculum consider multiple hazards?
- Is there space within the curriculum for students to consider and address local and community hazards and disaster risk reduction practices?
- Does the curriculum explain the causes and effects of hazards?
- Does the curriculum explain that disaster risk multiplies according to the level of hazard and degree of vulnerability but that it can be reduced according to societal and individual capacity to cope?
- Does the curriculum concretely address disaster prevention, mitigation, preparedness and resilience building?
- Does the curriculum establish synergies with co-curricular or extra-curricular disaster risk reduction initiatives?
- Does the curriculum treat both rapid onset and slow onset disasters?
- Does the curriculum include climate change education?
- Does the curriculum explore gender aspects of disaster risk reduction?
- Does the curriculum consider disaster risk reduction education within a framework of education for sustainable development?
- Does it also establish synergies with emergency education, environmental education, child and human rights education, child-friendly education and life skills education?



B. DRR Pedagogy

- Is learning and teaching directed towards realizing skills and attitudinal and dispositional learning outcomes as much as knowledge and understanding learning outcomes?
- Does learning stay in the classroom or does it also take place in wider school and community contexts (the 'field')?
- Are students given opportunities to practise disaster risk reduction skills in real life contexts through action learning?
- Are children offered the opportunity to assume a catalytic role and horizontal forms of leadership within local community disaster risk reduction?
- Is interactive learning a regular feature of the DRR classroom?
- Is experiential learning (around both actual and surrogate experience) a regular feature of DRR lessons?
- Do students work in teams to undertake DRR-related enquiry and research?
- Are students encouraged to engage with hazard and disaster at an emotional/feelings level?
- Are students called upon to exercise their imaginations through DRR learning?
- Are efforts made to use textbooks in interactive and action-oriented ways?
- Are special efforts made in terms of sensitive classroom facilitation when disaster risk reduction learning is happening in post-trauma contexts and/or contexts also marked by slow onset disaster?

C. DRR Student Assessment

- Is there summative assessment of students' DRR learning?
- Is there also ongoing formative assessment of their DRR learning?
- Is portfolio assessment of student DRR learning in place drawing upon and bringing together a range of assessment modalities?
- Is assessment, taken as a whole, balanced, incorporating both summative and formative elements and diverse assessment modes?
- Is assessment designed to illuminate student DRR learning in a holistic and comprehensive way?
- Is equal assessment space given to DRR-related skills and attitudinal development as to acquisition of knowledge and understanding?
- Is assessment an interesting and welcomed aspect of student learning?
- Does the teacher feed learning from assessment into lesson revision and classroom facilitation?
- Is DRR student assessment linked together with CCE and ESD learning assessment?
- Are learner assessment tools constructively aligned with the range of DRR learning outcomes?

D. DRR Learning Outcomes

- Is a comprehensively articulated list of DRR learning outcomes available for the both primary and



secondary curriculum as a whole?

- Are fully articulated subject- and grade-specific lists of DRR learning outcomes available?
- Do the lists give equal weighting to knowledge and understanding, skills and attitudinal/dispositional learning outcomes?
- Are DRR knowledge and understanding, skills, and attitudinal and dispositional learning outcomes systematically widened and deepened grade by grade?
- Are learning outcome lists periodically evaluated and revised in the light of accumulating experience?
- Is the range of learning and teaching approaches employed fit for purpose in terms of realizing the spread of agreed learning outcomes?
- Have clear and direct linkages between learning outcomes and forms and styles of assessment been established?

Extracted from: Disaster Risk Reduction in School Curricula: Case Studies from Thirty Countries.



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Internet Resources

Community Mapping through Transect Walks – <https://catcomm.org/transect-walk/>

Child-Centred Disaster Risk Reduction Toolkit – <http://education4resilience.iiep.unesco.org/en/node/533>

Take Care: A Tool Kit - <https://www.preventionweb.net/educational/view/66657>

Kia Pakari: Schools' Resilience Programme - <https://www.redcross.org.nz/what-we-do/in-new-zealand/disaster-management/looking-after-yourself/kia-pakari-schools-resilience-programme/>