Literature review on disaster resilience education: Enhancing individual knowledge of disaster resilience among children and public based on best practices of japan and other countries

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Aminath Shaufa

Project Officer

National Disaster Management Center

Republic of Maldives

DISCLAIMER

Contents of this research paper is prepared by Ms. Aminath Shaufa, Visiting Researcher of 2018 term (August-November) Batch A, for the Asian Disaster Reduction Center, Kobe, japan.

Currently I hold the position of project officer for the National Disaster Management Center, Republic of Maldives. The findings, interpretations and conclusion represent my own work and all sources of information included in the report is acknowledged from primary and secondary sources and does not signify the views of the Asian Disaster Reduction Center or National Disaster Management Center.

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ACRONYMS

ADRC	Asian Disaster Risk Reduction
CCDRR	Child Center Disaster Risk Reduction
CSS	Comprehensive School Safety
DRE	Disaster Resilience Education
DRR	Disaster Risk Reduction
DM	Disaster Management
FRS	Fire and Rescue Services
GHAE	Great Hanshin-Awaji Earthquake
GEJE	Great East Japan Earthquake
HFA	Hyogo Framework for Action
IEC	Information, Education and Communication
MoE	Ministry of Education
MNDF	Maldives National Defence Force
NDMC	National Disaster Management Center
NEOP	National Emergency Operations Plan
SEOP	School Emergency Operations Plan
SFDRR	Sendai Framework for Disaster Risk Reduction
SDG	Sustainable Development Goals

ABSTRACT

The purpose of this literature review is to examine best practices in Japan and other countries to enhance individual knowledge of disaster resilience among children and public in the Maldives and further strengthen those programs. After compiling all the information from the study visits and one to one discussion with the disaster education practitioners, it was identified that disaster resilience education is a global problem where the mechanism of belief need to be addressed rather than knowledge change.

To attempt this, an exploratory research methodology was utilized to examine possible education content and processes that could be used by emergency agencies and other organizations to design plans, programs and activities that build disaster resilience in local communities

Keywords: Disaster Resilience Education, Disaster Resilience, Emergency and Exploratory Research Methodology,

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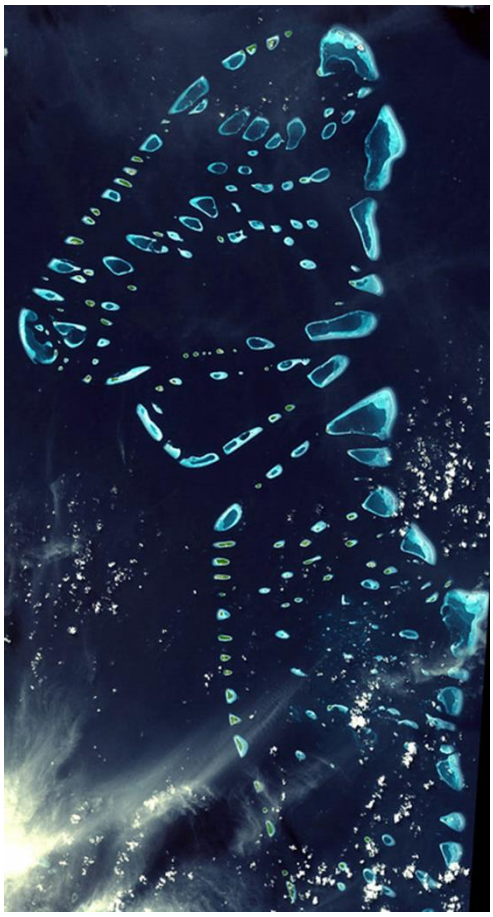
CHAPTER 1

Introduction

The Maldives are a group of scattered islands in the Indian Ocean, located to the south west of Sri Lanka. It consists of approximately 1,190 coral islands grouped in a double chain of 26 atolls, spread over roughly 90,000 square kilometers, making this one of the most disparate countries in the world. The Maldives archipelago stretches 823 km north to south and 130 km east to west. Over 99% of the Maldives is made up of the sea: only 0.331% (115 square miles) of its 35,000 square mile surface area is dry land.



The islands that make up the Maldives are very small (most can be walked across in 10 minutes; only a few are longer than 2 kilometers) and low-lying (they rarely reach more than six feet above sea-level). This makes them particularly vulnerable to sea erosion. In 1812 and again in 1955, devastating gales destroyed many northern islands, while in 1987 the capital, Male, was flooded by a severe storm. If, as some scientists predict, global sea levels continue to rise as a consequence of global warming, it will pose a particular risk to the Maldives.

Disaster is a sudden, calamitous event bringing great damages, loss and destruction and devastation to life and property. The damage caused by disasters is immeasurable and varies with geographical location, climate and the type of the earth surface/degree of vulnerability. This influences the psychological, socio-economic, political and cultural state of the affected area and people. Especially the children who end up being the most vulnerable group.

In the wake of sufferings caused by natural and man-made disasters in the last couple of decades, a new realization is taking place in the contemporary world. It is the realization of importance of disaster preparedness, early warning and effective emergency response. With the comprehension of importance

of disaster management, there triumphs a general conception to minimize the threats to life, livelihoods and infrastructure, through effective public awareness, utilizing technology-based systems.

With the paradigm shift towards disaster management approach in recent years, preparing and planning for hazards in a proactive manner rather than reacting to the disaster is practiced through disaster managers, this anticipatory approach has evolved after a strong realization that post-relief remains ineffective if no measures are taken before the disaster strikes. Therefore, it can be claimed that preparedness is actually the most important phase of post-disaster management, especially in a country like Maldives, where the communities are alienated via a huge sea barrier.

Emergencies are dealt with when they occurred and less is done in terms of preventive measures. Authorities focus on short term issues such as compensation and the need for shelters or reconstruction, to satisfy the immediate expectations of the general public. However, they neglect the more long-term issues after an emergency ad preventing future incidents, However, there is a recent trend to include mitigation measures in emergency legislation and policies and not only be reactive and respond to emergencies when they occur.

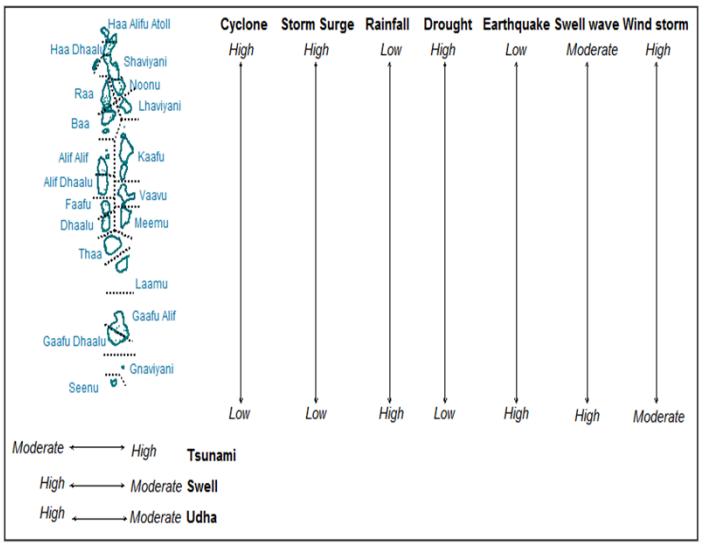
Disaster resilience education has been widely recognized at the global and national level as a core mechanism for reducing risk and strengthening resilience among children and adults. In the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) and previous Hyogo Framework for Action (2005-2015) indicators emphasized on the use of knowledge, innovation and education to build a culture of safety and resilience at all level. In Maldives, formulation of local disaster management plans began in early 2013, later introducing disaster management plans for the resorts and other sectors as well. The School Emergency Operations Plan (SEOP) formulated by Ministry of Education in 2015 identifies the delivery of school disaster management plan and disaster drill in all the schools, public or private.

Disaster Resilience Education: Disaster resilience education (DRE) is the development of hazard-related knowledge, skills and strategies, to enable learners to participate as active members in skilled and resilient communities.[1]

[1] Australian Institute for Disaster Resilience: https://www.schools.aidr.org.au/disaster-resilience-education/what-is-dre/

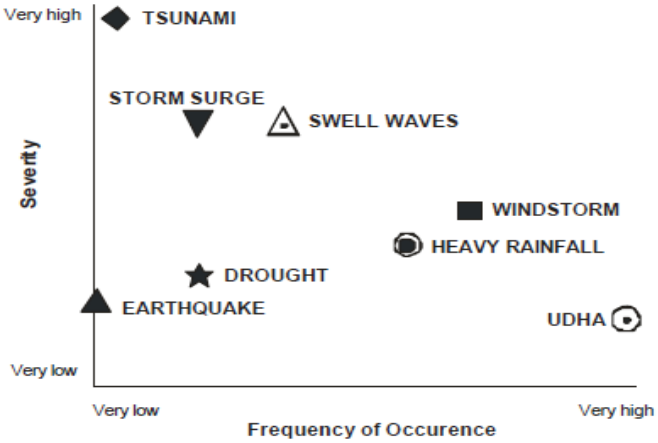
Overview of Hazards and Disaster Risk

Maldives is a low lying island nation comprising of over thousand tiny islands. All islands are subjected to physical vulnerability due to the country's extremely low elevation and the flat topography. The wide dispersal of its population of 3 hundred thousand, across the islands is also a significant contributing factor. The frequency of natural disaster of large scale is relatively low in Maldives. However, the 2004 Indian ocean Tsunami brought devastating impact to the life of its people, economy and development progress. With the realization, discussions and mindfulness for disaster preparedness began among the communities. Back then locals had a belief that Maldives is a country safe from catastrophic disasters with little to no historical records. Hence, 2004 Indian Ocean Tsunami came when no once was prepared, not knowing what Tsunami is.



However, studies and impact reports have been formulated exposing the vulnerabilities, hazards and risks of the Island nation. Islands in the Northern part is more prone to cyclone, storm surge, and tsunamis, while the Central Part of the nation is more susceptible to tsunami and Southern part has risk of earthquake tremors from the nearby Sumatra Subduction Zone, or Carlsberg Ridge.

SOURCE: NDMC, NEOP, HAZARD INDEX



The impact of a hazard in higher population concentration areas will be likely higher than in less populated areas. The Haa Dhaalu, Seenu, Raa, Haa Alifu, and Kaafu (Figure) are having higher population concentration and are exposed to various levels of hazards. It has to be noted that the islands in Seenu Atoll and Malé island in Kaafu atoll are densely populated, which increases the probable chances of impacts to the exposed hazards.

Generally, the Maldives, regularly get affected by high frequent low impact seasonal events such as monsoonal flooding, coastal erosion, salt water intrusion and intense sea surges related flooding due to sea level rise.

FQ: HAZARD PATTERNS IN MALDIVES, DIRAM 2007

FIQURE: POPULATION EXPOSURE TO HAZARDS BY ATOLL (DIRAM, 2008) POPULATION (CENCUS, 2014)							
Atoll Names	Population	Earthquake	Tsunami	Heavy Rainfall	Drought	Tropical Cyclone/Storm Surge	Swells /Udha
Haa Alif	197056	Low	High	Low	High	High	Moderate
Haa Dhaalu	13004	Low	High	Low	High	High	Moderate
Shaviyani	18570	Low	High	Low	High	High	Moderate
Noonu	12127	Low	Moderate	Low	High	High	High
Raa	10556	Low	High	Low	High	High	Moderate
Lhaviyani	14934	Low	High	Low	High	High	Moderate
Baa	8919	Low	Moderate	Low	High	High	High
Kaafu	7996	Low	High	Low	High	Moderate	Moderate
Alif Alifu	12232	Low	Moderate	Low	High	Moderate	High
Alif Dhaalu	5915	Low	Moderate	Low	High	Moderate	High
Vaavu	8183	Low	High	Low	High	Moderate	Moderate
Faafu	,622	Low	Moderate	Low	High	Moderate	High
Meemu	4711	Low	High	Moderate	Moderate	Moderate	Moderate
Dhaalu	4140	Low	Moderate	Moderate	Moderate	Moderate	High
Thaa	5329	Low	High	Moderate	Moderate	Moderate	High
Laamu	8923	Moderate	High	Moderate	Moderate	Moderate	Moderate
Gaafu Alifu	11841	Moderate	High	High	Low	Low	Moderate
Gaafu Dhaalu	8477	Moderate	Moderate	High	Low	Low	Moderate
Ganviyani	11653	High	High	High	Low	Low	Moderate
Seenu	8095	High	Moderate	High	Low	Low	High

Background and Significance of the Research

National Disaster Management Center (NDMC) was established aftermath of 26th December 2004 Indian Ocean Tsunami by a presidential decree. Before 2004 the need to mitigate, prepare for disasters was not a topic that was spoken or addressed in the Maldivian community because of the fewer hazards (floods, sea surge) and not knowing the impact of mega disasters (i.e. Tsunami). However, after the death of 82 people and 26 went missing from 2004 Tsunami, urgent need to cater the matter at hand and take immediate actions began. Thus, NDMC has worked towards response and recovery for 9 long years managing IDPs to restore everything to normal state.

2004 Tsunami experience showed us the need and importance of disaster education, specifically Tsunami education and practicing exercise programs for the public and children targeting people living in Greater Male' region and in Islands. Programs such as public awareness, community based programs or DRM digital outreach lacked during the time. It was until 2013, we pass the recovery and rehabilitation stage, focusing more on to preparedness efforts.

In Maldives, disaster preparedness through school curriculum and public outreach via disaster management programs and digital engagements is a weak area due to various reasons.

SOURCE: NDMC, SCHOOL TSUNAMI DRILL IN GA. VILLINGILI, 2017

Therefore, working at NDMC from 2014 has taken my main focus on to community engagement and preparedness through Community Disaster Management Programs (CBDRM), conducting awareness sessions to schools and other such preparedness projects along with the introduction of the official website and social media accounts and having to manage both from 2016.

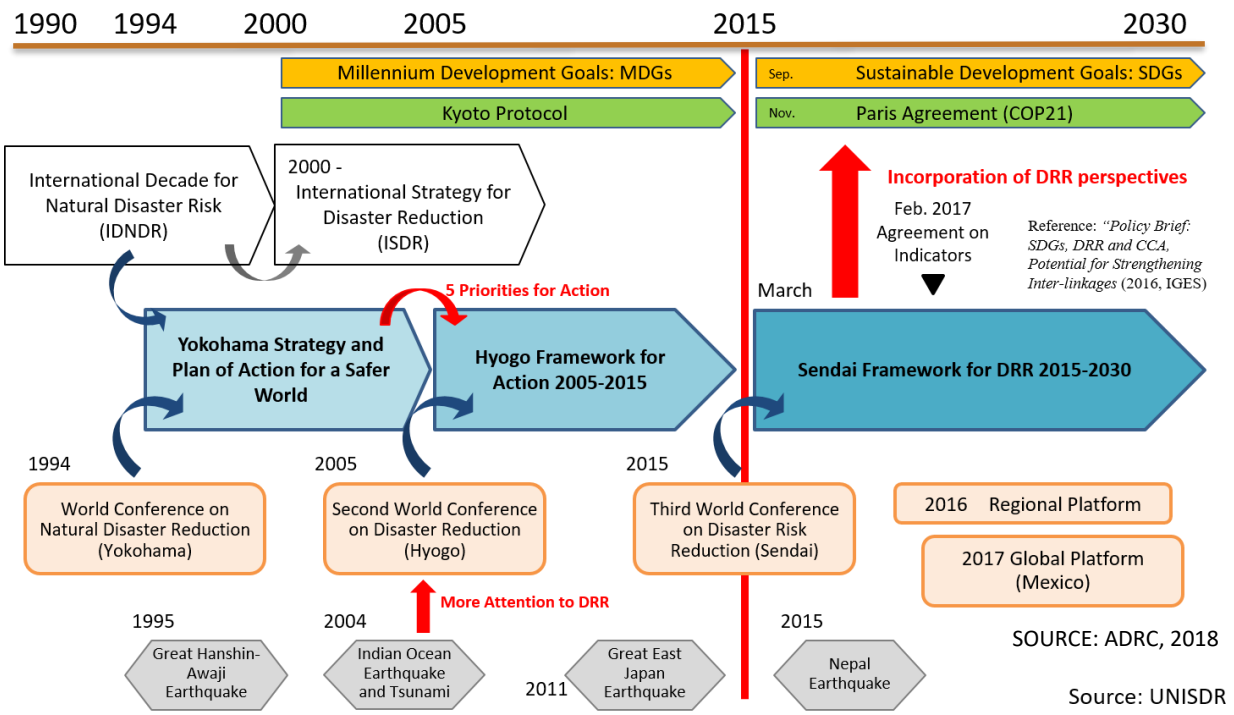
Identifying the need to conduct a nationwide survey to Evaluate (school) educator's knowledge of disaster and resilience began after being actively engaged in the implementation of School Tsunami Drills from 2017in local islands for the UNDP's and Japan's regional project 'Reducing the loss of lives of school children from tsunamis in Asia and the Pacific through better awareness and preparedness''. This is first program of its kind to implement in Maldives history. Conducting these awareness programs to

the school students and local community on tsunami preparedness and implementing full scale Tsunami Drill in the Islands drew my attention on the importance of developing a fully structured disaster education program where government and non-governmental partners can work together in achieving the same goal of making the children and communities more resilient.

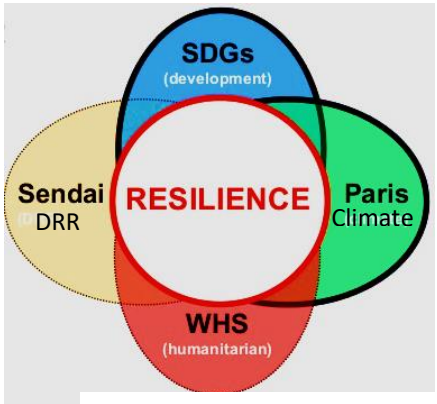
SOURCE: UNDP IN ASIA AND THE PACIFIC

CHAPTER 2

Global Disaster Education Situation



In the past decades, global frameworks have been developed for disaster risk reduction with the elements of coherence and resilience[2]. The Yokohama Plan of Action and the Hyogo Framework for Action (HFA) have guided nations and communities to strengthen and invest in disaster risk reduction (DRR) measures.



SOURCE: PLACARD, 2017

The Sendai Framework is the successor instrument to the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience

[2] Global Frameworks (Margot Steenbergen, October 2017) - https://www.placard-network.eu/joining-forces-cca-drr-workshop/

of Nations and Communities to Disasters. It is the outcome of stakeholder consultations initiated in March 2012 and inter-governmental negotiations held from July 2014 to March 2015, which were supported by the UNISDR upon the request of the UN General Assembly (UNISDR, 2018)[3]

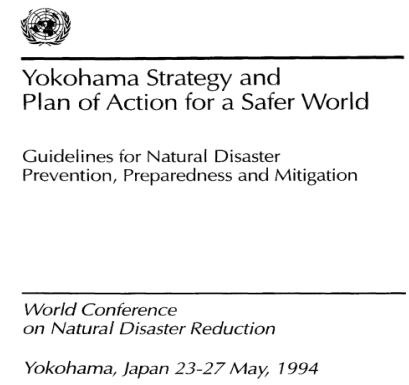
Yokohama Strategy and Plan of Action for a Safer World[4]

Strategy C: - Strategy for the year 200 and beyond, (Page 12)

- Education and training in disaster prevention, preparedness and mitigation

Plan of action: - Activities at the community and national levels (Page 14)

- N: Establish and implement educational and information programmes amide at generating general public awareness, with emphasis on policy makers and major groups, in order to ensure support for, and effectiveness of disaster reduction programmes



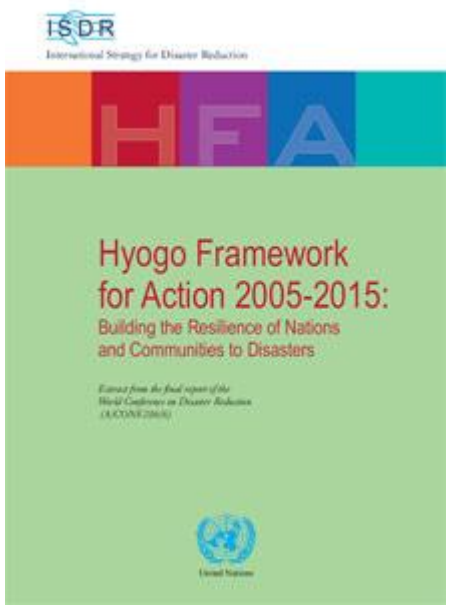
Hyogo Framework for Action 2005-2015

3 Strategic Goals

1. The integration of disaster risk reduction into sustainable development policies and planning

2. Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards

3. The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes.



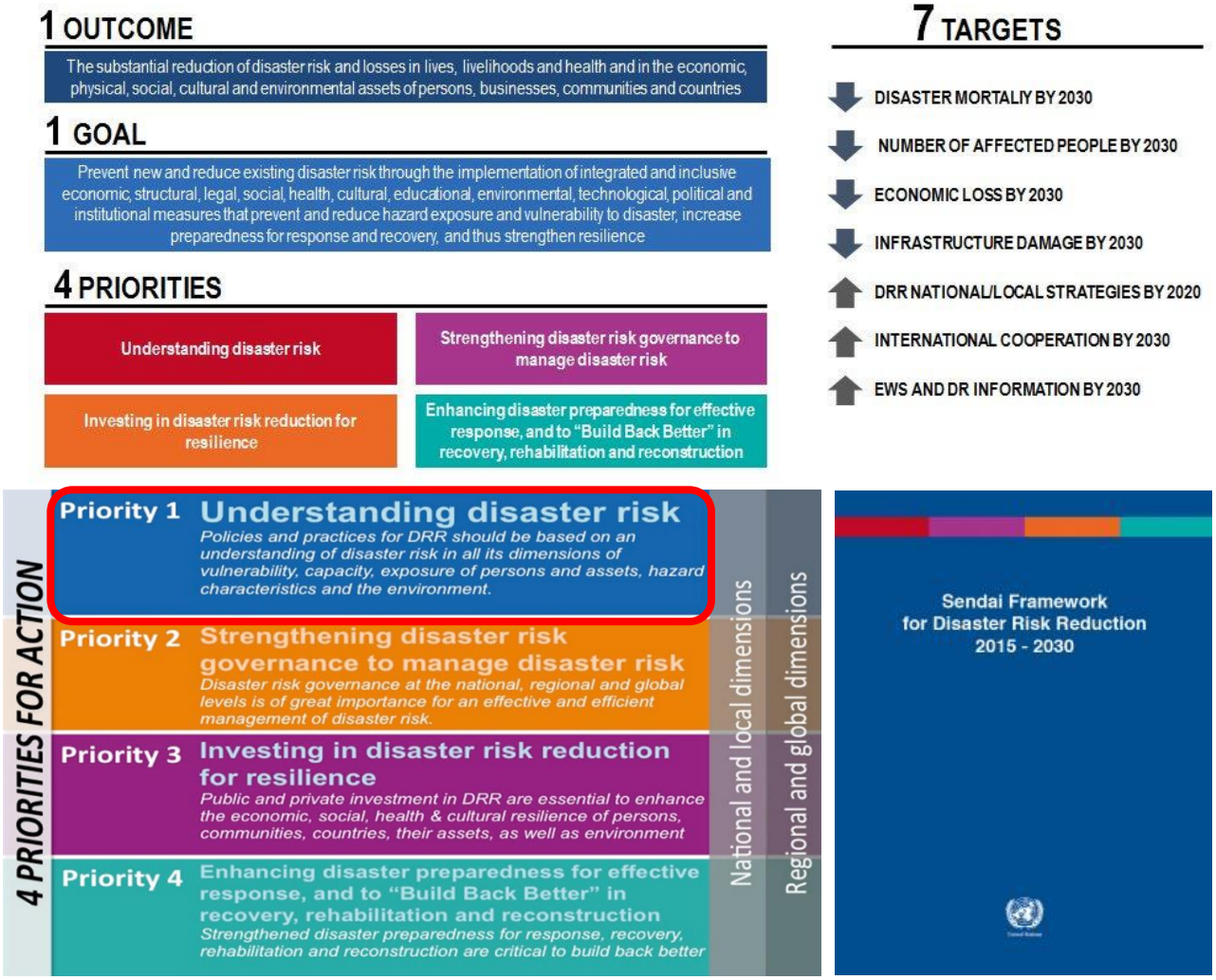
[3] https://www.unisdr.org/we/coordinate/sendai-framework

[4] Yokohama Strategy and Plan of Action for a Safer World
https://www.unisdr.org/files/8241_doc6841contenido1.pdf

Five priorities for Action

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience **at all levels**.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

Sendai Framework for Disaster Risk Reduction 2015-2030

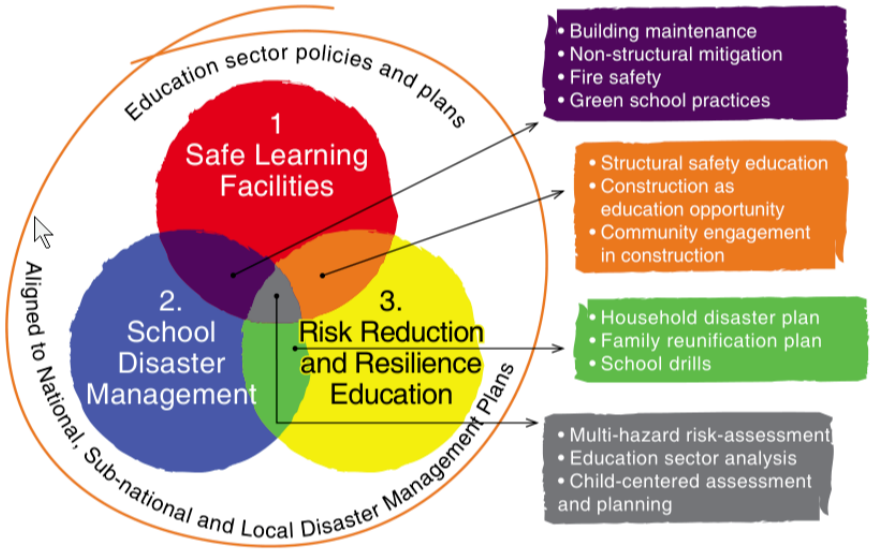


Sustainable Development Goals – Goal 4 (Quality Education)

Comprehensive School Safety (CSS) Framework

Comprehensive school safety (CSS) provides a comprehensive approach to reducing risks from all hazards in the education sector developed in 2012 with the definition of "an all-inclusive approach to reducing risks, stresses and shocks faced by children, teachers, schools and communities, founded on the participatory multi-hazard risk assessment and development of safe learning facilities, school based disaster management, structural and non-structural safety and risk reduction education'' (working Draft, South Asia Regional Policy Framework for Child-Centered Disaster Risk Reduction)

A safe school has minimal disruptions during disasters and thus continues to provide a conducive learning environment for children with 3 pillars[5].



SOURCE: ASEAN Safe School Initiative

[5] : ASEAN Safe School Initiative - https://aseansafeschoolsinitiative.org/home-2/towards-school-safety-in-asean/

Regional Disaster Resilience Education Situation

There are more than 600million children in South Asia, who constitute 27 percent of the world child population and 36 percent of the total population in the region while relative child population of Maldives covers 34.78% (2013)[6]. Children comprise 60% of total casualties in most disasters in the region. Children are especially vulnerable and disproportionately affected by disasters and other crisis. Emergences can do significant damage in a child's formative years, affecting their growth and development.

To strengthen capacities of children to survive and cope with disasters, are being held. In Bangladesh, swimming lessons for children was one of the activity that was carried to reduce the risk of children drowning in flood waters, in earthquake prone countries like Nepal, children were taught how to duck-cover-and-hold in the event of an earthquake.[7]

SOURCE: CHENNAI FLOOD, AHMEDABAD, GANDHINAGAR (2017)

In September 2015, in Kathmandu (Nepal), member states from the South Asian Association for Regional Cooperation (SAARC) endorsed the "SAARC Framework and Road Map on Child-Centered Disaster Risk Reduction". In the conference all member states agreed on the importance having a child center DRR approach and rapid implementation given the context of child causalities due to disasters during the last decade in South Asia. One of the agreed actions is to strengthen capacity building in the CCDRR approach.

UNICEF ROSA is one of the United Nations (UN) agency that conducts workshops to DRR professionals to increase the regional's capacity on Child-Centered Disaster Risk Reduction by partnering with Asian Disaster Preparedness Center (ADPC) and with other South Asian countries to strengthen child-centered approaches with disaster risk management. One of their aim is to facilitate integration of CCDRR in to mainstream development and planning process as well as develop skills for CDRR plans and initiatives.

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[6] Child Centered Disaster Risk Reduction in South Asia (2015), http://ndmc.gov.mv/assets/Uploads/48413-childcentereddrrsouthasia2015.pdf

[7] South Asia Regional Policy Framework for Child-Centered Disaster Risk Reduction

In conducting these workshops, their rational is that children's specific vulnerabilities and their requirements for basic survival including nutrition, health, psychosocial care and protection. The main killer in the South Asian region is children being susceptible to natural hazards and climate change induced vulnerabilities. South Asia's children underlines the importance of addressing the fact that children now account for 70 percent of those impacted by frequent disasters striking in the region.

UNICEF's Child-Centered Disaster Risk Reduction (CCDRR) program for children creates long term development gains for children and society at large. Participation, empowerment and equitable development further help in stabilizing fragile states and in building more sustainable societies.

In their workshops they cover contents on basic concepts and terminologies for understanding CCDRR, South Asia Regional framework on CCDRR, Core commitments for children (CCCs) in Humanitarian Action, Comprehensive school safety (CSS), assessing disaster risks, hazards assessments, child centered vulnerability and capacity assessments, child centered disaster risk assessments, communications risks, child centered DRR planning, child centered emergency preparedness planning and mainstreaming CCDRR into development process.

CHAPTER 3

Status of Disaster Resilience Education in Maldives

Disaster resilience education has become a debatable area in the recent disaster forums and papers. It's noted that disaster resilience has no given definition. However, it addresses in bolstering the capabilities of communities by heightening the disaster resilience skills of each individual enhancing their capabilities to proactively engage in the event of calamities.

'VOSHUFILAA' TRADITIONAL TEACHING METHOD

Disaster resilience education is a holistic methodology which involves communication and engagement. Australian and New Zealand Disaster and Emergency Management Conference paper gives the notation that disaster resilience education, communication and engagement (ECE) ought to additionally involve learning regarding the community itself, as well as a way to scale back vulnerabilities and connect communities through social capital formation (Dufty, 2014). Thus creating an educational climate is important to foster equilibrium of the three elements; knowledge, attitude and skills. It is vital to know the history of the community that you live or reside in, attitude to work together as a community and the know-how of evacuation centers, safest routes, lifesaving skills and so forth (Cabinet Office 2015, p. 5)[8]. Opportunities for disaster resilience education, communication and engagement were known within the main learning domains: behavioral, cognitive, emotive and social. The findings are undeniable, that several current disaster educations, communication and engagement programs (Dufty, 2014)

The Maldives invests more than 20% of its GDP on social services (education and health). Quality education, elimination of educational disparity and decentralization of educational service has been the main educational policy of the government for years. Maldives is one of the few countries who has achieved universal education. However, much has to be done to improve the countries disaster resilience education strategies.

[8] Cabinet Office (Disaster Management Office), Tokyo. Japan

Executive Committee for Disaster Management Education Challenge Plan

Education System in Maldives

The traditional education system is replaced by the British system of education with the establishment of primary and secondary schools. Curriculum development began in 1976. Simultaneously other programs were introduced and continued through the 1970s and until the mid-1980s from where on the First Ten Year Master Plan for Educational (1986-1995) began implementation. English language is used as the medium of instruction in most schools; however, there are schools that provide Arabic and Islamic education specifically.

The first western-style school in the Maldives is the Majeediyya School, a secondary established in 1927. The school was originally co-educational, but it was felt necessary to create a second school for girls (Aminiyya School) in 1944.

The literacy rate of Maldives is one of the highest in the world (98%) and the educational standards are highest in the region. Roughly 35% of the Maldives is under 18 years old, making education a key area for social investment in the national future. Since the Maldives unified its education system in 1978, it has gone from 70% literacy, with women more likely to be illiterate than men, to universal primary education and a 98% literacy rate (UNICEF Maldives).

The method of teaching and learning process in the schools even in the early grades, are exam driven. The schools conduct their own examinations until the 10^{th} year. Students sit a national exam in the 10^{th} year, Secondary School Certificate (SSC) in Dhivehi and Islam and Cambridge O level for other subjects. After the 12^{th} year students sit for the national Higher Secondary Certificate (HSC) exam in Dhivehi and Islam and London Edexcel A Level exam for the rest of the subjects.

A milestone in educational services was reached with the establishment of the Maldives College of Higher Education – MCHE in 1998. Maldivian students now have the prospect of post-secondary education (from diplomas to bachelor's degrees in certain areas) at the many faculties functioning under the MCHE. In early 2011 Maldives National University was formed by collaborating and upgrading all the faculties of the then Maldives College of Higher Education.

Education, which was primarily concentrated in Male', the capital city is now extended throughout all parts of the country. Establishment of Atoll schools in the Maldives has provided a nationwide access to education. With the limited number of universities field of study areas in the Maldives, Maldivians have to travel to other countries to obtain higher education.

The Maldivian government is continuously making an effort to improve educational standards in Maldivian schools. In these efforts, the Maldivian government is making large investments in secondary, vocational and higher secondary education.

	Pre-Primary		Primary		Lower Secondary		Higher Secondary	
	Atoll	Male'	Atoll	Male'	Atoll	Male'	Atoll	Male'
Government Schools	-	1	193	13	176	13	45	4
Community Schools	120	4	-	1	-	3	-	1
Private Schools	102	16	1	3	-	3	-	4

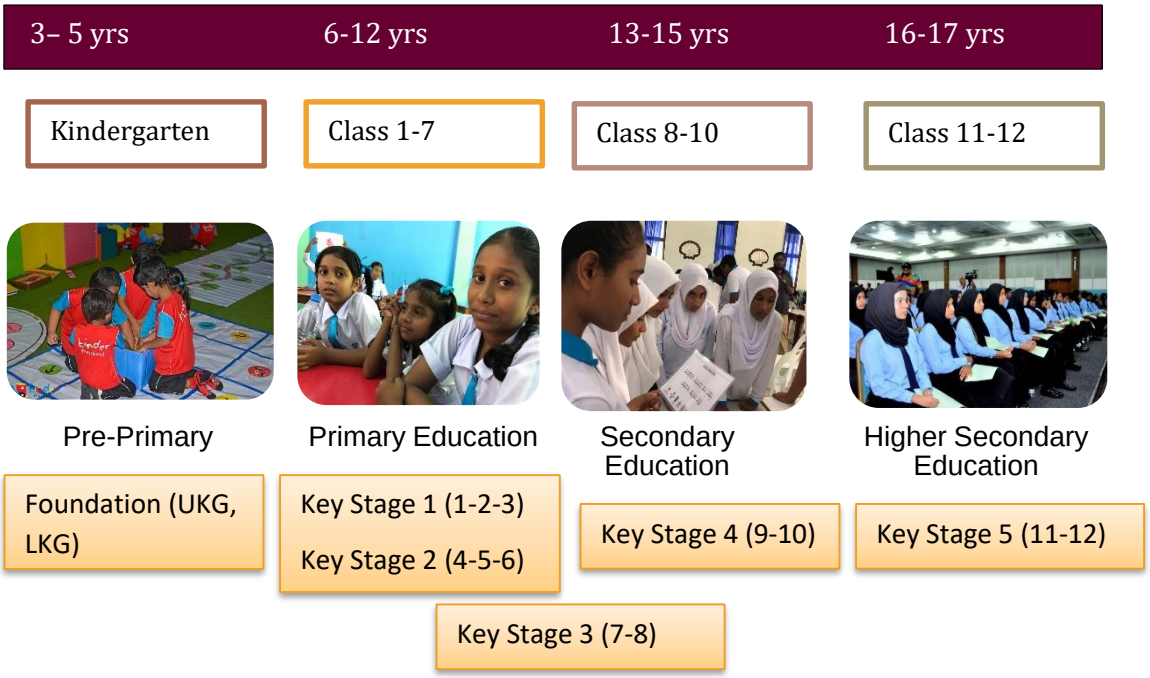
SOURCE: SCHOOL STATISTICS, MOE

Across the country there are four types of schools: state-run schools, state subsidized community schools, public-private partnership schools (PPPs) and private schools. Altogether, 375 schools provide education for just under 88,000 students, a quarter of the national population. Out of these schools, 58% are state-run. Male', the capital, has 6% of the total schools providing education for 41% of the student population. In terms of equality of access for both the sexes in education, gender parity in the Maldives education system is high across all levels of school education[9]

[9] Improving Education in The Maldives: Stakeholder Perspectives On the Maldivian Education - https://www.researchgate.net/publication/275042035_IMPROVING_EDUCATION_IN_THE_MALDIVES_STAKEHOLDER_PERSPECTIVES_ON_THE_MALDIVIAN_EDUCATION

Official School Ages by Level of Education

Primary education lasts seven years and starts at the age of 7. Secondary education begins at age 12 and lasts for 3 years. Completion of secondary education prepares students to sit for the London GCE 'O' levels examinations. Higher secondary education is available in a government establishment in Male' after which candidates get ready for the London GCE 'A' level exams.

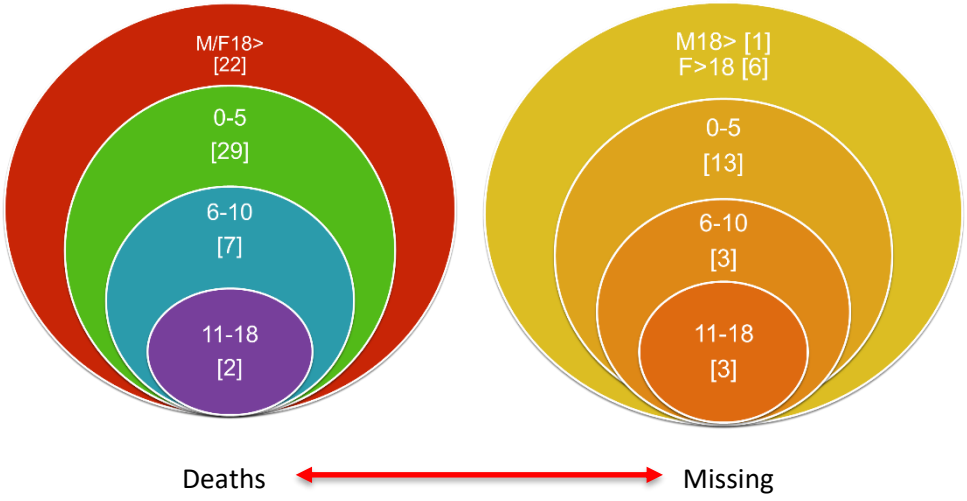


Significance of Disaster Education

Children's are the most vulnerable group of people in the society. They spend half of their day in school or engaged in extracurricular activities. Hence disaster education plays a significant role in developing a disaster preparedness culture among children of all ages. For years it's been a taboo that children must not be included in the disaster preparedness phase. However, children being the victims and them being the hero in most situations has changed the impression that indeed they must be well informed of natural disasters and preventive measures as well as adults.

In the catastrophic December 26, 2004 Tsunami which swept over the countries in the Indian Ocean, children accounted for one third of tsunami deaths. The proportion of casualties rose as 39% of the

population represented children in the eight hardest hit countries (UNICEF, 2004). Along with Indonesia, India, Sri Lanka and Thailand, Maldives was also hard hit by the 9.2 magnitude tsunami leaving 82 people dead and 86 people missing till date.



FQ: STATISTICS OF THE VICTIMS

Thought a huge number of children's lives was lost, there are many documented stories of how children proactively saved villages and families from the calamity because at some point in their life they have learnt about the signs of tsunami and proved to the world they need a voice and many reasons to use them in making the cities more resilient.

Disaster resilience education initiative bore fruit in Japan after the Great East Japan Earthquake of March 11, 2011. Exemplifies by the case of Kamaishi City of Kamaishi Higashi Junior High School in Iwate Prefecture, where the lives of many school children and students who at school saved from the tsunami (Cabinet Office 2015, p. 5)[10]

[10] Cabinet Office (Disaster Management Office), Tokyo. Japan
Executive Committee for Disaster Management Education Challenge Plan

CASE STUDY: The Effectiveness of Disaster Resilience Education at Kamaishi Higashi Junior High School (Kamaishi City, Iwate Prefecture) from the Great East Japan Earthquake

Kamaishi Higashi high school is located approximately 500m from the coastline and has long been identified as vulnerable to tsunami. The Unosumal district where Kamaishi Higashi Junior High School is located, depopulation has led to the high school being abolished, meaning that the junior high school students have to take the lead in propelling initiatives in the community.

Given this, Kamaishi Higashi Junior High School has implemented a disaster resilience education program on an ongoing basis with the following three aims. From the desire for each student to become project leader in the community's disaster prevention in their capacity as a member to the regional community.

- Be responsible for promoting your own life
- From rescued to rescuer
- Passing on the culture of disaster resilience

The disaster resilience education program was implemented with the aim of cultivating the ability of students to judge circumstances by themselves and to proactively take the initiative in reacting. The program encompassed collaborative initiatives with the region including joint evacuation exercises with the neighboring Unosumai Elementary School and disaster resilience learning programs involving all school members called ''EAST rescue" which also involved local households and people throughout the community.

When the GEJE struck, the 570 students of Kamaishi Higashi junior high school and Unosumai elementary school applied what they had trained to do over and over again, and all begun to evacuate toward high ground as soon as the earthquake struck. Their ability to calmly judge their situation as it unfolded around them lead to protect and save all their lives from the surging tsunami.

Diversity and Inclusion of Disaster Resilience Education

The United Nations Conversation on the Rights of Children (UNCRC) in 1989 states “every child has the right to education, irrespective of disability and without discrimination of any kind” (Ferguson, 2014). Sustainable Development Goal 4 on Education and the Education 2030 Framework for Action emphasize inclusion and equity as laying the foundations for quality education (UNESCO, 2018). Kaur & Aurora (2014) defines Inclusive education as an educational approach and philosophy that provides all students with community membership and greater opportunities for academic and social achievement to increase participation in a way that effectively responds to the diverse needs of all learners. The need for progress on inclusive education is crucial, especially given the context of international targets such as the Millennium Development Goal (MDG) of universal primary education by 2015 and the goal of Education for All (EFA) by 2015. These goals are achievable only if the persons with disabilities are included.

In Maldives, currently more than 75% students are enrolled in pre-primary, primary to high secondary grades from 2.5 to 18 years of age, (NBS Pocket Book, 2016) local language being Dhivehi and a high percentage speaking in the second language, English. Out of this, there is an alarming percentage of children who lives with various disabilities, among whom are school goers while the rest are unable to get a school education.

Socioeconomic, mental, physical, living condition, and other factors pose a risk of exposure to vulnerabilities and hazards around them. All these factors also depend on the capacity to response and recover from disasters. Hence it is crucial to engage and involve all the children regardless of their disabilities or their ethnicity or geographic location, in the disaster education and communication process (Wisner et al. 2006, peek 2008). The successful implementation of any inclusive policy is largely dependent on educators having a positive approach (Avramidis, 2000). Wherein, teachers play a responsible role in children’s behavior and learning, in both normal and special education needed students. In fact, inclusive education is crucial for special need children with their different abilities.

Inclusive education in Maldives started recently. Implementation of the new strategy has lot of drawbacks; one factor being lack of professional experts. Therefore, early childhood educator’s perception on integrating the children with special needs in mainstream classes become a very important matter in teaching. Teacher’s role in student’s success is huge, and their potentiality plus their dedication helps to uplift the entire school (Killion, 2007). Even though the school provides leaning

environment, teachers play the most important part in student's personal developments, in all areas. Thereby to provide an effective teaching; teachers need to fully know his/her students (Youk, 2014). Knowing a student includes knowing his/her background, and what motivates the students to learn. Furthermore, her abilities and disabilities are also need to be noted so he/she can be facilitated accordingly in the best suitable way. Without these types of information, it is not likely to bring out the best in students with special needs (Armstrong, 2004).

In a theory proposed by (Cartney.Mc, 2006) As cited on Deirdre Barry Power (2010), According to mc Carty (2006), in his research says that inclusive education get students many benefits and training for adults living.

DRR Information, Communication and Education Materials

Capacity building activities have been undertaken in the Maldives in the past, these activities have mostly concentrated on health and environmental aspects rather than inclusive disaster education.

A number of disaster risk reduction educational materials have been developed and implemented in countries around the world. However, there seems to be a general lack of evidence showing the effectiveness of these interventions and whether they have contributed to the overall enhancement of community resilience and ultimately to disaster risk reduction. To be effective, disaster educational programs must result in greater disaster resilience in communities at all levels.

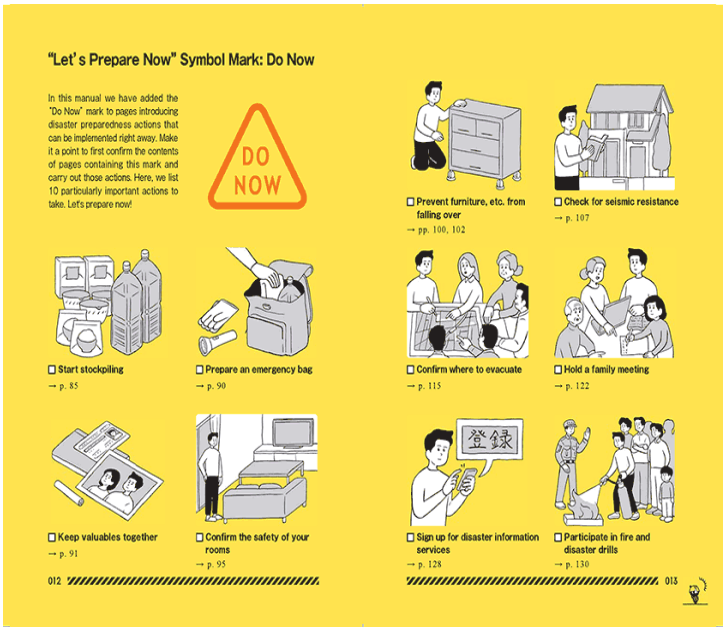
During the study visits to multiple institutions and organizations in Hyogo Prefecture, Kobe City, Osaka City, Tokyo City and Hokkaido to gather research data, I have come to conclusion that the institutions have solid DRR education materials and brochures. The brochures consist of lot of attractive mascots and colorful diagram to educate earthquakes, Sediment disasters and Tsunamis including well established museum in most of the institutions. But I was in self-doubt of the outreach of the IEC materials to the public. According to the Cabinet Office (Sept 2018), distribution task of ICE materials is given the municipalities, however the percentage of outreach has not been figuratively identified and that it remains unsolved.

DRR Awareness Materials and Activities

- Tokyo Bosai – A Manual for Disaster Preparedness[11]

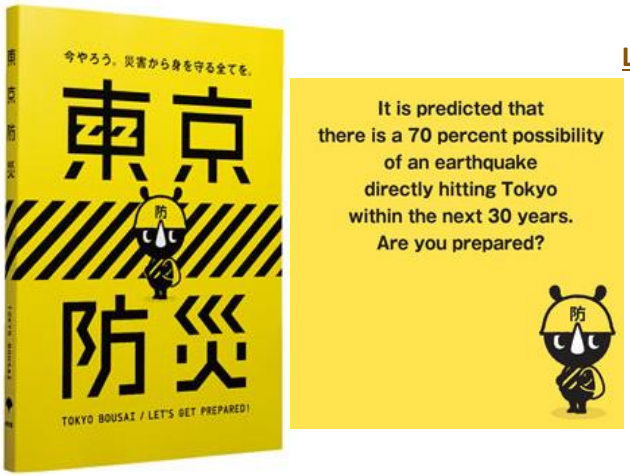
Recently Tokyo residents could find a nicely designed yellow package in their post box. Containing some fun elements such as heaps of illustrations, map, sticker and even a 16-page Manga, it is something entirely different. The package contains Tokyo Bōsai or the Disaster Preparedness Tokyo, a manual to help households get prepared for an earthquake directly hitting Tokyo and advise on various other disasters.

Disaster Preparedness Tokyo was compiled by The Tokyo Metropolitan Government and is tailored to the various local features of Tokyo, its urban structure, and the lifestyles of its residents, and contains easy-to-understand information on how to prepare for and respond to a disaster. It contains information which are useful now – to get prepared – and in the event of an emergency.



Bosai the Rhino – Throughout the manual Bosai-kun (防サイくん) a cute rhino character is used on chapter divider pages. Even disaster preparedness can be fun

[11] http://www.metro.tokyo.jp/english/guide/bosai/index.html (PDF Download)



LIST OF CHAPTERS OF THE BOOKLET:

- Simulation of a Major Earthquake
- Let's Get Prepared – Disaster Preparedness Actions
- Other Disasters and Countermeasures
- Survival Tips
- Disaster Facts and Information You Should Know
- Manga comic: "TOKYO 'X' DAY"

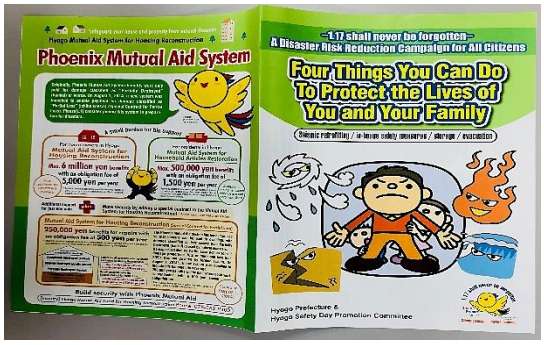
❖ The Great Hanshin-Awaji Earthquake Memorial Disaster Reduction and Human Renovation Institution

- A Study Note on Learning Disaster and Life.
- Implementation of "Summer Vacation Disaster Mitigation School 2018" by the DRI Museum

'A Study Note on Learning Disaster and Life' (1995.1.17) includes contents on how to prepare for an earthquake and how to live with earthquakes while the book is user friendly with short questions and answers, inclusive of exercises students and the adults can further enhance their knowledge.

- ‘Four Things You Can Do to Protect the Lives of You and Your Family’

  A handy pamphlet that covers contents on seismic retrofitting, in-house safety measures, storage, evacuation and what to do in an emergency with attractive visualizations.



- Disaster prevention guide for children and parents – 10 Points to protect your family

Points on different hazards in both English and Japanese with diagrams explaining what to do during in an emergency and in disasters, how to use emergency dialing system and etc.

According to the booklet, Hyogo Prefecture sends out disaster information (Earthquake, Tsunami, and weather alerts) and evacuation information to residents in English, Korean, Chinese, Portuguese and Vietnamese with free mobile registration.

Addressing the Maldives context, the main constraint or issue for this particular subject has been the ‘need’ and ‘want of people. Since Maldives is a country with high impact low frequency disasters, most people do not take disaster education seriously as it should be taken.

Digital media has become the most feasible way to reach the majority of the population. Social Media, television, radio, print and online media are pathways of information dissemination and channels of public demands. They are the highest possible medium to create awareness. Natural disaster is unavoidable. So early warning and precautionary measures would help in minimizing the loss to life and property.

- Living tomorrow for Students

  Developed by Board of education in Hyogo prefecture in 1997. There are 4 type of materials, for lower grade in elementary school, higher grade in elementary school, for junior high school, for high school.

❖ “Iza! Kaeru Karavan”?

A fun program of learning about disaster prevention through playing with families and friends. The “Iza! Kaeru Caravan[12]!” program that started in 2005 is extending its activities in other countries while understanding the regional characteristics and proposing disaster prevention activities suitable to the region. BOSAI (Disaster prevention), a new aspect of Japanese culture, has been exported to various countries.

The awareness is growing overseas as well after the experiences of various disasters such as the large-scale eruption of Mount Merapi in Indonesia, the heavy flood in Thailand, and the damage caused by typhoon on the island of Leyte, The Philippines.

❖ Red Bear Survival Camp[13]

survival experience program for parents and children. The participants have fun while learning what to do during a disaster and acquire the skills and strength required to survive whatever situation they may face.

❖ DRR Festivals and other such events

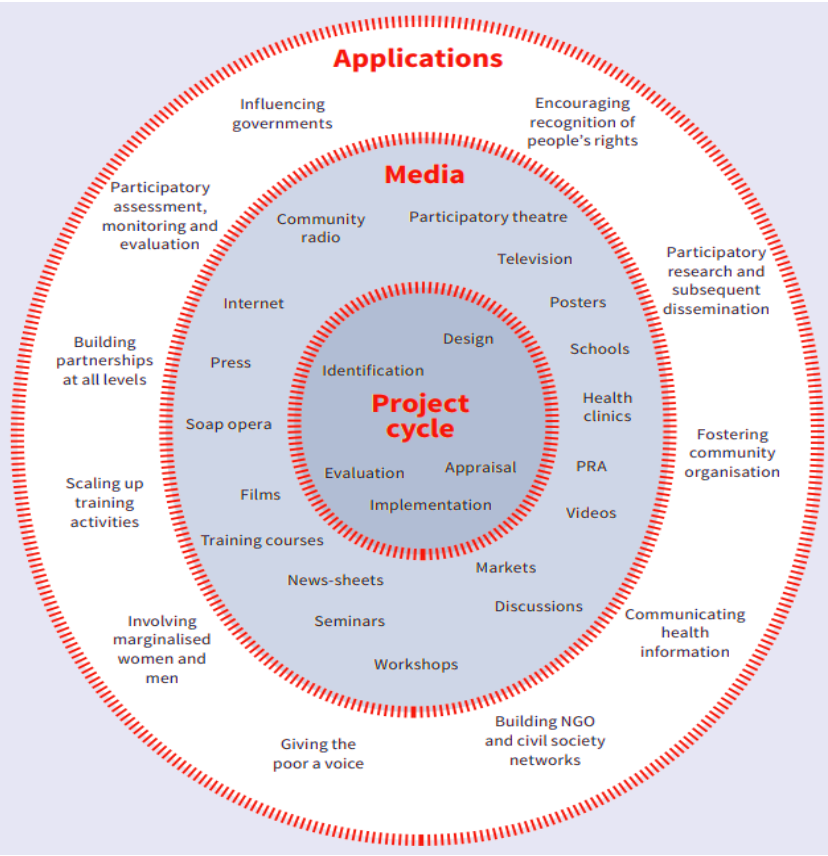
DRR festivals that include activities such as narrow route escape games, children’s cooking classes (how to cook emergency food), storytelling written by students, making paper box (origami)

[12] “Iza! Kaeru Caravan”? http://kaeru-caravan.jp/en.html

[13] Earth Manual Project - http://www.earthmanual.org/p05en/

DISSEMINATION OF DRR INFORMATION, AND EDUCATION MATERIALS

Strategic, coordinated work to generate and communicate knowledge about DRR brings benefits to significant numbers of vulnerable people. Good communication also has an important part in public decision-making processes. Most DRR communications initiatives aim to promote behavioral change amongst communities and their organizations, but there are also opportunities to achieve social change by supporting community dialogue or collective action on issues of risk and vulnerability. Like participation, communication should aim to shift the balance of power towards communities by enabling people to investigate, define and explain their own problems[14].



SOURCE: A. BURKE, COMMUNICATIONS AND DEVELOPMENT: A PRACTICAL GUIDE (LONDON: DEPARTMENT FOR INTERNATIONAL DEVELOPMENT, 1999, http://www.eldis.org/vfile/upload/1/document/0708/doc7389.pdf, p. 24.

[14] Disaster Risk Reduction, Twigg, J (2015), - https://goodpracticereview.org/wp-content/uploads/2015/10/GPR-9-web-string-1.pdf. Page 191

All DRR programmes should include communications and awareness-raising as a central, ongoing element, and they should have a clear strategy for doing this. In practice, relatively little time and effort is invested in this area. It is often just a component added to the end of individual projects, undertaken by people without specialist training or skills. Public education therefore becomes fragmented into separate, one-off, short-term interventions whose impact is rarely assessed. Ideally, it should be a long-term, sustained process that seeks to raise awareness and stimulate protective action progressively and sustainably.

ICTs, which play an important part in DRR are now extensively used worldwide to raise public awareness of hazard risk and support household and community action, especially in preparedness and response.

Communication methods for DRR

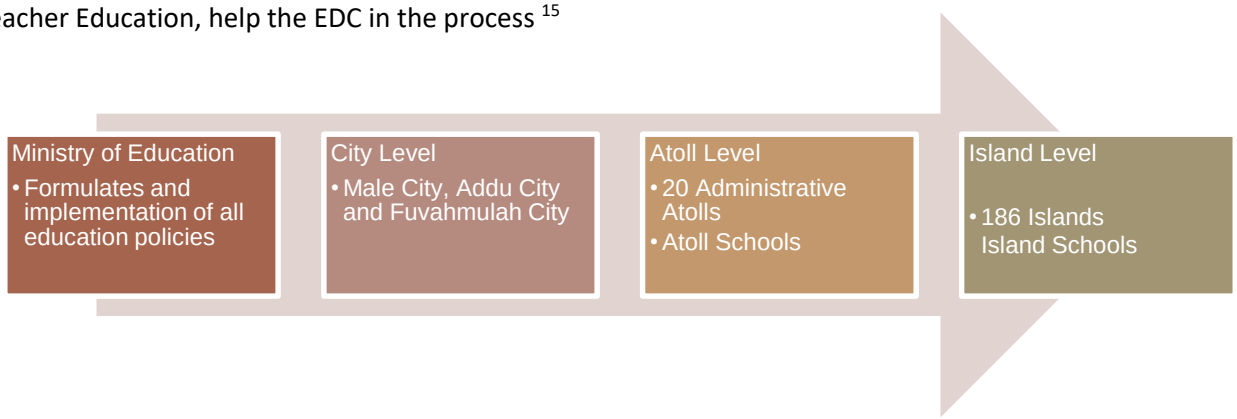
- Interpersonal Communication
- Printed, Visual and Audio-visual Media
- Maps and communication tool
- Use of radio (Public Information Broadcasting, Participatory radio)
- Presenting and Interpreting Images
- Use of Social Media
- YouTube

CHAPTER 4

Curriculum alignment

The curriculum plays a huge role in implementing a good inclusive program. It should be flexible and accessible. As cited on UNESCO (2005), "Strategies such as flexible time frames for work completion, differentiation of tasks, flexibility for teachers, time for additional support and emphasis on vocational as well as academic goals can be useful" (Callan, 2013). According to that it is very important for educators to ensure that the curriculum provides those opportunities for teachers for student's success. The curriculum should as well offer a supportive welcoming environment for students with special education needs.

In the Maldives, National Curriculum is based on fundamental principles within an Islamic framework. These principles, derived after several stages of consultations, encompass democracy, equity, nationalism, independence, innovation for development and strengthening of the Maldivian society. Based on these fundamental principles, the MOE, in consultation with the National Education Council (NEC), produces national objectives for the education sector (see above). The Educational Development Centre (EDC) is responsible for translating these national objectives into curriculum statements after appropriate consultations. Once the Minister of Education adopts the curriculum statements as policy, EDC draws up the national frameworks for individual subject areas, the syllabi, textbooks, teacher's guides and other relevant resources. Subject panels, consisting of practising teachers and subject specialists from various sectors, including the Department of Public Examinations and the Institute of Teacher Education, help the EDC in the process [15]

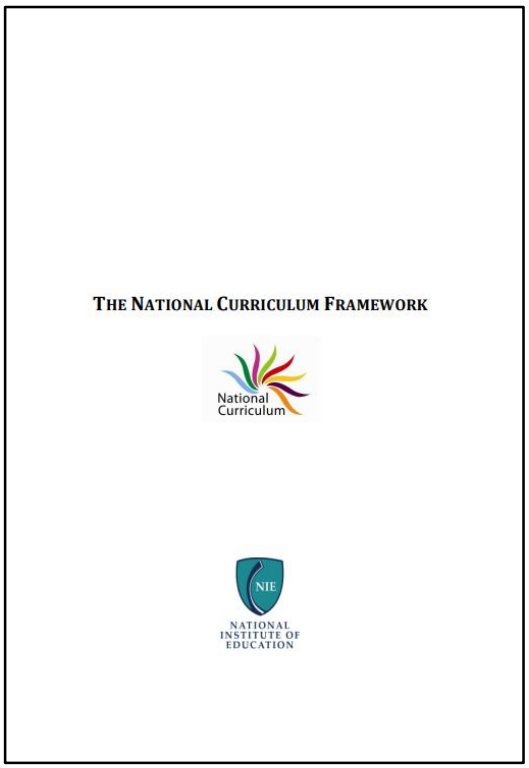


[15] Education policies, curriculum design and implementation at the level of upper primary and general secondary education- http://www.ibe.unesco.org/curriculum/Asia%20Networkpdf/ndrepmv.pdf

Detailed Interrelationships Between Various Bodies Involved in The Adaptation of Curricula in The Maldives

	CENTRAL LEVEL	REGIONAL/PROVINCIAL	SCHOOL LEVEL
	MINISTRY OF EDUCATION (MOE) EDUCATIONAL DEVELOPMENT CENTRE (EDC) DEPARTMENT OF PUBLIC EXAMINATIONS (DPE) INSTITUTE FOR TEACHER EDUCATION (ITE) SUBJECT PANELS (P)	ISLAND OFFICES (10) ATOLL EDUCATION CENTRES (AEC) ATOLL PRIMARY SCHOOLS (APS)	HEADS SUPERVISORS (SP) TEACHERS COMMUNITY PARENT/TEACHER ASSOCIATIONS (PTA)
AIMS & OBJECTIVES	Sets national aims (EDC MOE). Sets national codes of behaviour (MOE). Trains teachers according to national goals (ITE). Ensures school-based supervision and support (MOE).	Interprets aims to teachers (IO/ AEC/APS). Interprets national codes of behaviour for pupils and teachers. Sets local codes of behaviour for pupils (AEC/APS).	Interprets aims and objectives to pupils (heads/teachers). Interprets local and national codes of behaviour for teachers and pupils (heads).
CURRICULUM PLAN	Writes national syllabus and allocates appropriate syllabus for secondary level (EDC, P). Decides time allocations (EDC/ MOE). Trains teachers for the implementation of the national curriculum (ITE). Ensures achievement of curriculum objectives (MOE).	Teaches according to national syllabus (AEC, APS). Timetable as recommended (AEC, APS). Recommends community participation (IO, AEC, APS).	Makes schemes of work (teachers, SP, heads). Timetable according to recommended time allocations (heads, SP and teachers). Teach according to national syllabus (teachers). Controls co-curricular activities (heads, SP, PTA). Provides assistance to schools (PTA).
METHODS & APPROACHES TO TEACHING	Prepare teachers' guides which recommend teaching methodology (EDC, P). Moderate teaching methodology through supervision (MOE). Train teachers in the use of certain methodology (ITE).	Conduct workshops for teachers on teaching methodology (AEC, APS). Facilitate in conducting field trips and other field work (AO, IO).	Practices recommended methodologies (teachers). Relate methods according to student needs (teachers). Relate teaching to local community (teachers).
MATERIALS	Commissions to write textbooks for the national syllabus (EDC, P) Choose textbooks for secondary schools. Produces or commissions to produce audio-visual materials for the national syllabus (EDC).	Choose educational resources for school use (AEC, APS). Initiate locally relevant resource materials (AEC, APS).	Gives importance to the use of recommended textbooks (heads, SP, teachers). Procure resource and supplementary materials (heads, PTA, community/parents)
EVALUATION & EXAMINATION	Set central examinations and expected standards (DPE). Train teachers in assessment and evaluation (ITE).	Conduct regional workshops for teachers on assessment and evaluation (AEC, APS).	Evaluate and assess all aspects of student achievement (teachers, SP, heads). Sets all internal tests and examinations (teachers, SP, heads). Marks work and keeps records (teachers, SP, heads).

SOURCE: EDUCATION POLICIES, CURRICULUM DESIGN AND IMPLEMENTATION AT THE LEVEL OF UPPER PRIMARY AND GENERAL SECONDARY EDUCATION, ABDUL MUHSIN MOHAMED AND MARYAM AZRA AHMED



A new National Curriculum[16] was implemented in 2013. The key issues discussed in the discussions reviews was the school subjects, and whether the curriculum provides a balanced framework to meet the needs of the education system of the Maldives, the Maldivian context and the students. The National Curriculum was also discussed in relation to students with special needs or disabilities. In the Maldives children with physical disabilities are supported, but with significant variations across the nation. It was seen that currently, there are no mechanisms established within the education sector to identify or address the needs of students with disabilities in terms of curriculum or resources. overall there is much to be done to integrate students with special needs into the wider learning environment[17].

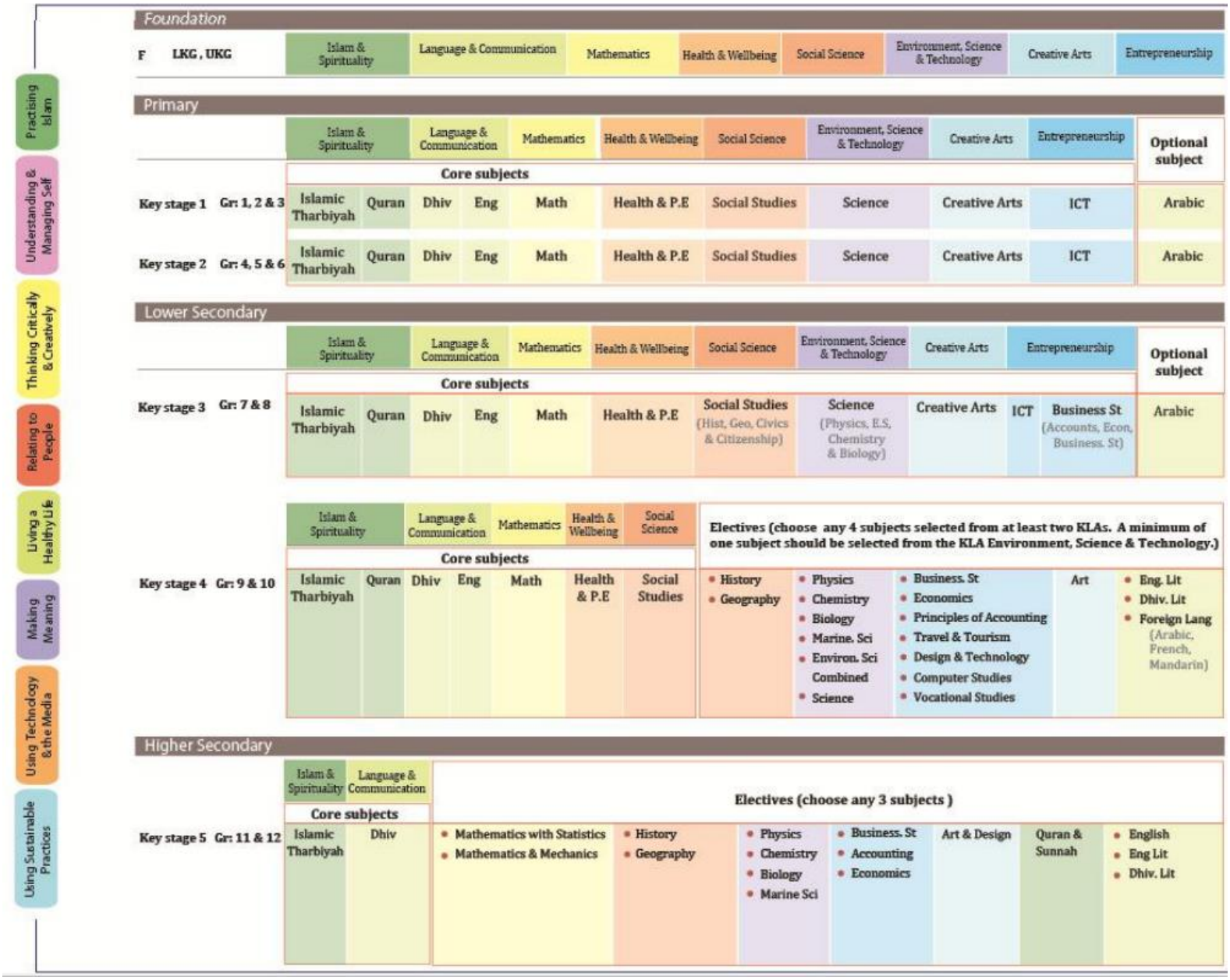
In the Maldivian curriculum some subjects address the disaster management concept. Among those subjects, Social Studies is one subject which give a thorough concept on climate change and natural hazards. Several reforms have already been introduced into the content and teaching methodologies of the national curriculum that came into effect in 1984. However, this curriculum now needs a major revision to adjust and strengthen it to enable our citizens to face the challenges of the twenty-first century. A major nationwide curriculum review activity is planned for April 1999.

In general, the curriculum covers compulsory 4 modules Qur'an, Dhivehi, Islam Mathematics, and English and Other subjects according to the school standard as the table below.

[16] National Curriculum Framework - https://www.moe.gov.mv/assets/upload/National_Curriculum_Framework_English.pdf

[17] International Journal of Small Economies Vol. 4 No. 1Year 2013 Pages 23-38 https://www.researchgate.net/publication/275042035_IMPROVING_EDUCATION_IN_THE_MALDIVES_STAKEHOLDER_PERSPECTIVES_ON_THE_MALDIVIAN_EDUCATION

HOW THE DIFFERENT KEY LEARNING AREAS ARE ADDRESSED AT EACH KEY STAGE OF LEARNING?



SOURCE: MOE, NIE, NATIONAL CURRICULUM FRAMEWORK

In 2013, Ministry of Education has put forward disaster preparedness week in the Academic calendar for the month of May and August (at the start of the year and the end of the school year). However, these weeks have not been very effective since teachers are not trained to conduct disaster preparedness or specific disaster related exercises or activities. (This accounts for all the schools in the islands and greater male' region too).

A one day 'School Preparedness programme was facilitated by National Disaster Management Center (NDMC) for primary teachers on March 7, 2015 of 5 schools in Greater Male' Area (Male'-Villigili-Hulhumale') to train teachers to conduct sessions for the students during disaster preparedness week. The program was designed in a way that the teachers would be able to practice disaster preparedness activities at their school during the preparedness week and when teaching lesson on areas of disasters.

Many concerns were brought up for allocating a disaster preparedness week without any handbook or proper guidance leaving it to the schools. So these weeks were mostly utilized for fire drills and fire evacuation rather than focusing on preparedness on natural disasters. As mentioned earlier, none other schools in Maldives, except the 5 schools of Tsunami Drill Project has had experience of any tsunami drills.

In my opinion, Maldives education system lack disaster resilience education content though a guide for 'school emergency operations plan' was formulated in (2009) along with Ministry of Education and UNDP Maldives[18]. The guide aims at educating school administrators and staff including students, on the necessary protocol to follow during an emergency that includes chapters on planning and response.

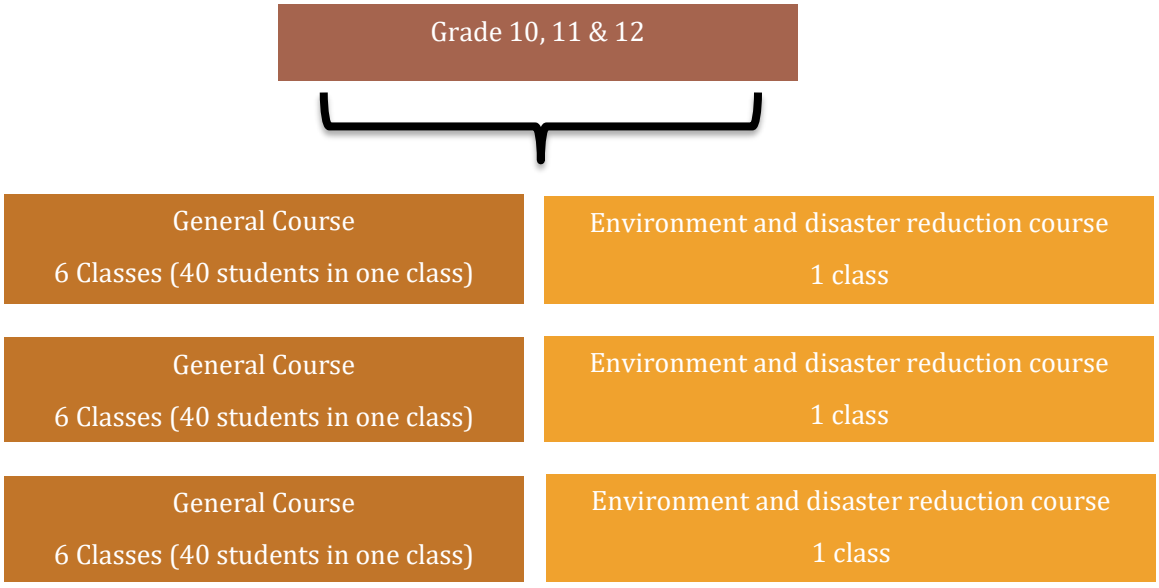
Providing theoretical and practical knowledge on disasters have been an issue among the people who conduct such programs professionally. In the recently developed key stage curriculum, introduction of disaster education is included from level 3 (students of age 9) to Level 8 (students of age 14) in their Science module, Social Studies module and Dhivehi module (mother language/first language module). Since it's being taught in different modules the inclusion is still frail in our curriculum which need be improved. Hence, there is a need to examine current disaster education practices with a view to aligning them to the broader goal of disaster resilience.

[18] Guide for "School Emergency Operations Plan" Maldives (First Edition)

Case Study of Maiko High School

During the visiting researcher program 2018, I visited Maiko High School in Maiko City, Hyogo Prefecture being the first school in Japan to have a well-established disaster management course in school syllabus. Maiko High School disaster management course was launched in 2002 after the 1995 Hanshin-Awaji Earthquake. Following the establishment of Maiko High School, Miyagi Tagajo High School launched their disaster management course in 2011 after the Great East Japan Earthquake being the second school in Japan to have a structured DM course in the school syllabus.

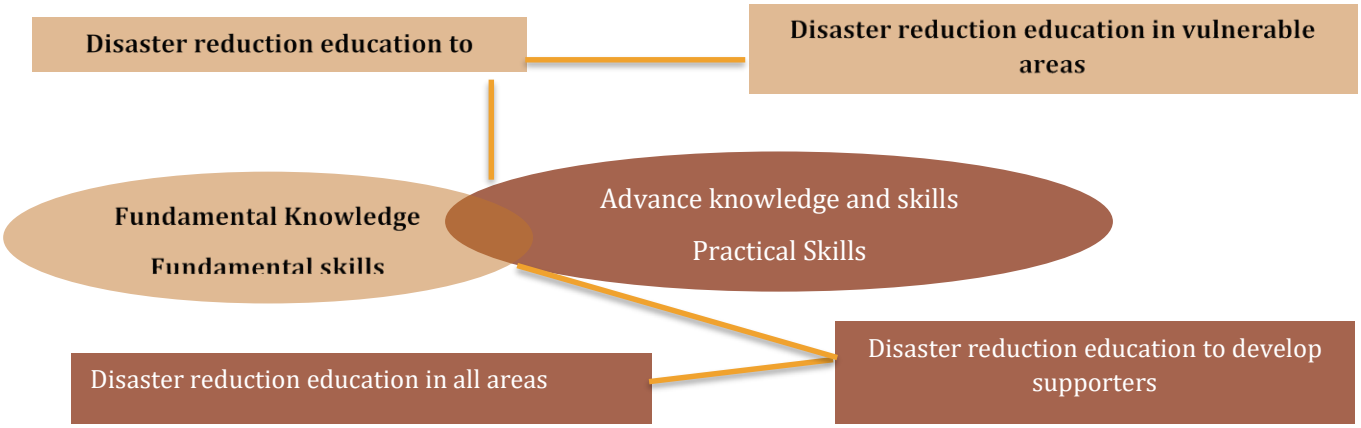
The learning process starts with an entrance exam which comprises of DM course and general course where the students would be sitting for either of the course. Students who chose DM course learn more about hazards in a detailed manner. “In terms of disaster education, they learn more than survival as they are taught to respond to disasters in Japan as well as outside Japan” Masuda (2018).



Currently 840 students are studying in Maiko High School in the general course while 120 students are enrolled in the Environment and disaster reduction course.

During the visit I got the opportunity to observe a disaster management class by the Environment and DRR course teacher Ms. Junko Masuda. She believed that the main purpose of disaster resilience education is to develop civil leaders with disaster risk reduction capacity by applying the knowledge from grassroots level. Also she believes that, given the chance some may be disaster management experts, while others can use the knowledge at household and community level which would improve the DRR capacity of the communities.

Disaster reduction education includes two types. One being the disaster reduction education to develop supporters and the other being disaster reduction education to survive. Furthermore, fundamental knowledge, fundamental skills and strong will to protect lives are taken in to consideration in the context of disaster resilience education according to Masuda (2018).



Further analyzed, students under the Environment and disaster reduction course studies 91 units according to Maiko High School curriculum while the general course students study 58-63 subjects and 25-31 special subjects.

General Subjects	Special Subjects
▪ Japanese ▪ English ▪ Math ▪ Science ▪ Social Study ▪ Physical Education ▪ Art ▪ Music ▪ Japanese Calligraphy ▪ Home Economics ▪ Computer Study	▪ Disaster and Human Being ▪ Environment and Science ▪ Computer Study in Disaster ▪ Activity in Disaster Reduction ▪ Social Environment and Disaster ▪ Natural Environment and Disaster ▪ Human Being and Society ▪ Reading on Disasters ▪ Graduation Research

Practical teaching styles are being adapted in Maiko High School to include action-based activities where the teachers and students can critically reflect on their responsibility towards disaster management issues in their school and in the community. Collaborative learning with elementary school students are being conducted on a regular basis by students of Maiko High School, which includes story telling about the past earthquakes, making hazard maps, liquefaction experiments with the elementary students, preparing survival kits and etc. Students proactive engagement and facilitation with other children helps boosts their knowledge more effectively as students teach instead of the teachers.

Environment and disaster reduction course of Maiko High school is not only confined to school environment, however their syllabus includes lots of engagement with experts from universities and institutions, field visits to the affected areas within Japan (Landslide areas, earthquake affected areas, disaster risk reduction museum etc) as well as overseas. Every year group of students from the school travel to Nepal to exchange friendship and communication with students from overseas and to expand their knowledge and capacity. They also take part in the actual auxiliary firefighting training conducted by the fire department, to teach them how to react and respond.

As a result of their outreach learning activities, Maiko High School believes that that students studying in the environment and disaster reduction course would be able to be successful DRR influencers in the future with opportunities to work for international cooperation and DRR, Welfare and DRR, Housing and DRR, Community building and DRR, Environment and DRR, food and DRR and Sports and DRR, Maiko High School refers to this method as 'Maiko Method' aiming to raise experts and citizens who can be the leaders at the disaster time.

At the end of the visit I was fortunate to engage with the students and ask them couple of questions and get genuine feedbacks of their academic course. When discussed about the how much the students apply what they learn from school at the household and community level, students responded saying, now they often discuss about the disasters, emergency kit, assembly points and evacuation routes at home in case of an emergency or disaster. Also some students responded by saying that they use emergency stock piling medium and practice 'rolling stock' method in their homes.

Collaboration and Partnerships

The importance of collaboration and partnerships between key stakeholders has been emphasized over the years. 'Disaster education take the world of education and curriculum into new and unfamiliar territory, which calls for alliance and partnership' (UNESCO, 2014). Collaboration and partnership between a wide range of key stakeholders from the emergency management and education sectors, private sector, academia, non-governmental and NGO's and community based organizations are required to effectively implement disaster resilience education to the children and to the public. Drawing on the expertise and partners working together increases the capacity of producing greater results that putting individual efforts.

A three-year Memorandum of understanding (MoU) between Ministry of Education and Maldives National Defence Force (MNDF) as the organizer and facilitator was agreed upon 08 February 2018 to work collaboratively with the technical assistance from National Disaster Management Center, where the parent organization is the Ministry of Defence and National Security.

The memorandum of understanding (2018) highlights collaborative actions to be taken jointly with:

Educational Supervision and Quality Improvement Division (ESQID) and Maldives National Defence Force, Fire and Rescue Service (MNDF, FRS)

- MNDF FRS technical team to identify and facilitate the implementation of School Emergency Operations Plan (SEOP) to the selected school and Implementation of emergency drills in the school identified by ESQUID.

Educational Supervision and Quality Improvement Division (ESQID) and National Disaster Management (NDMC)

- Identification and selection of schools by NDMC's technical team with ESQID
- Yearly implementation of disaster risk reduction training workshop, for the focal points of the selected schools.
- Monitoring of emergency drills and evaluation

Educational Supervision and Quality Improvement Division (ESQID) Role

- Identification of schools to implement disaster risk reduction activities with technical guidance from MNDF FRS and NDMC and notifying the selected schools.
- Monitoring and provide guidance to the schools on the implementation of School Emergency Operations Plan (SEOP)
- Participation of ESQID staff during the implementation of emergency drills by MNDF FRS and providing necessary support.
- Provide support to NDMC in the implementation of disaster risk reduction training workshops conducted to the school focal points.
- Formulating of coordinating committee with all the stakeholders involved in the school emergency operations plan.
- Provide support in conducting school SEOP and emergency drills at the schools.
- Arrange logistics required for travels and provide support in the implementation of school SEOP and emergency drills in the Atoll schools.
- Composing SEOP and emergency drill activity calendar and ensuring schools does comply.
- Emergency response teams at the school to conduct emergency drills with support and guidance from MNDF FRS.

Environmental education and community mobilization surveys have been carried out in the past with assistance from several donor agencies. Achieving sustainable development through education is important to develop a national momentum while engaging different sectors and institutions in disaster education and community mobilization are fundamentally cross-sectional.

Actions for Disaster Resilience Education

Disaster resilience education (DRE) is the development of knowledge and skills which enable learners to assess danger in the environment and take protective action before, during and after a potential disaster or emergency event. Community resilience for disasters could be improved with stakeholders coming together to deliver the same goal.

These organizations include government and inter-governmental, UN bodies and local communities that already are promoting DRR or could be involved in the promotion of disaster prevention.

Name of Agency	Summary
Ministry of Education	• Lead agency in formulating and implementation of all education policies
National Disaster Management Center	• Main coordinating body for disaster risk reduction activities • Implementation of Disaster management policies, programs and guidelines
Maldives National Defence Force, Fire & Rescue Service	• Primary responsibility of conducting fire emergency operations, carrying out rescue operations and providing protection to property. • Promotion of DRR activities at the school and community level
Maldivian Red Crescent	• Independent, voluntary, humanitarian organization in the Maldives. • Implementing DRR activities across Maldives
UNDP / UNICEF	• Knowledge, expertise and funding
Schools/PTA and Teachers	• facilitating the students with disaster risk reduction knowledge and exposure • Involvement of PTA members in the DRR activities
Academia (Higher Education Institutes)	• heighten awareness of critical thinking among students and teachers • pioneer new research areas in DRR
Local Communities	• Advocacy
Business Communities	• Engagement in DRR activities
Other groups (Women's Groups/Disability Groups etc)	• Engagement and Advocacy
Media	• Disseminating DRR awareness information

CHAPTER 5

Basic Principles for Successful Disaster Resilience Education

Education and public awareness are the cornerstone of approaches aimed at reducing people's vulnerabilities to natural hazards. However, most countries worldwide are missing out on the most important aspects such as introducing primary disaster risk mitigation, the physical protection of people and property, environmental stewardship and recognizing underlying vulnerability connected with tenuous livelihoods (Petal, 2007,2008). Disasters result from the interaction of social vulnerability and natural hazards, which combine to put certain groups of people at greater risk than others.

The best evidence of success for disaster risk reduction education is the disasters avoided. The effectiveness of disaster risk reduction education can be assessed at micro, macro, and macro levels of social organization in the targeted population. This means that there are indicators and measures of effectiveness, efficiency, adequacy, and satisfaction to be taken from individuals and families, organizations and institutions, communities and local governments, and then tested against social policies[19]

Micro Level	Macro Level
Assessing risks and holding regular planning meetings.	Widespread consciousness of hazards, vulnerabilities and capacities (knowledge of
Identifying an out-of-area-contact, and having meeting places and reunification plans (including young children knowing their full name and address).	measures to be taken before, during, and after a disaster).
	The applications of effective early warning systems.
Maintaining insurance.	Responsible land-use planning.
Buying/renting in safe location.	Structural safety standards and their enforcement.
Building/retrofitting disaster resistant housing.	Other physical risk reduction measures.
Taking measures to secure building contents and belongings.	Environmental stewardship.
Taking fire prevention methods.	Community-based planning and assessment.

[19] Disaster Risk Reduction Education: Material Development, Organization, Evaluation. Available from: https://www.researchgate.net/publication/277821824_Disaster_Risk_Reduction_Education_Material_Development_Organization_Evaluation

Learning disaster response skills (for example, first aid, fire suppression, wireless	Community-based risk reduction activities.
communications, light search and rescue, water rescue, incident command systems)	Community-based response preparedness skills development.
Maintaining survival provisions and emergency kits.	
Maintaining emergency communication systems and local applications of early warning systems.	
Reducing, reusing, and recycling	

SOURCE: PETAL, MARLA 2008 (SAVE THE CHILDREN)

Implementation of Holistic Education in The Formal Education Process

The holistic education movement does not have a single source, a predominant proponent, or a major form of expression. Consequently, it is difficult to define holistic education[20]. The greatest limitation to formal education and training occurs when facts and knowledge are transferred from teachers to students without any related development of skills or understandings of certain issues.

Holistic education brings positive impact on the transformation of students' character values, by providing development-oriented focus such as: students' values of intrinsic religiosity by instilling values of faith deeply and affect students' daily behaviors, instilling students' emotional quotient, able to control emotion well, self-motivation, caring others (Sutarmen, Tjahjono & Hamami 2017), As this approach gives the possibility of appealing to what students already know and at the time create ways where the children can enhance their knowledge and understanding of their surroundings.

Forbes (1996) states, in "holistic education the classroom is often seen as a community, which is within the larger community of the school, which is within the larger community of the village, town, or city, and which is, by extension, within the larger community of humanity".

[20] Paper on "Whose values are shaping education?" For the Third Annual Conference on Education, Spirituality and the Whole Child at the Roehampton Institute, London

Holistic educators feel that schools must be places where the relationships we want as adults exist for the students as much as possible - where open, honest and respectful communication is the norm; where differences between people are appreciated; where interaction is based on mutual support and not on competition and hierarchy; where the common weal is the responsibility of each individual; and where the decision making process (if not engaged in by everyone at some level) is at least accepted by everyone.

SOURCE: URBAN MONTESSORI EDUCATION,2017

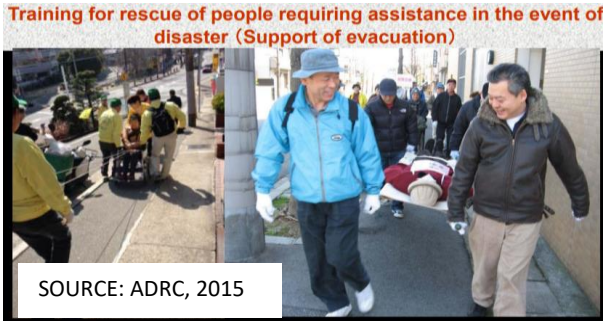
Although capacity building activities have been undertaken in the Maldives at different levels in the past, a long term educational strategy is required to achieve widespread understanding of the hazards and vulnerabilities of the surrounding environment. This is essential to boost individual knowledge on disasters as it would provide individuals and communities with better disaster risk reduction mechanism and life improving, self-help strategies in the face of emergencies and disasters.

Case Study (BOKOMI) – Disaster Safe Welfare Communities

Japan is a country that experiences the most frequent natural disasters in the world. Experiencing one after the other, they have accumulated enough knowledge than any other country. They have also developed skills of responding and preparing for disasters through its past experiences. In January 1995, Hyogo Prefecture experienced 'The Great Hanshin-Awaji Earthquake' an unprecedented disaster that killed over 6400 people, with extensive damages registered up to 10 trillion yen.

The citizens of the Kobe City created 'Disaster Welfare Community'' hoping that they would not have to suffer another tremendous disaster or neither others have to suffer from such disasters, During the past 15 years Kobe citizens have developed these systems by trial and error. Irei, (2010) Director General of JICA Hyogo states that it's a good example of community based disaster management 'that Kobe city can proudly present to the world[21].

Director General, Kobe City Fire Bureau, Onoda, (2010) "In japan, disaster education in schools is mostly teacher oriented". He also states that the educational programs are resident oriented and that involves the entire community in preparing for and working towards disaster prevention.



SOURCE: ADRC, 2015

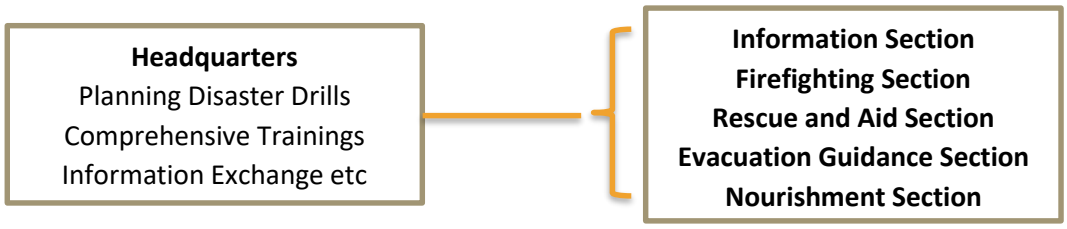
During one of the study visits, I had the chance to encounter a BOKOMI community leader Mr Haddori from Tsurukabuto community. He shared his experience of the evolution of the BOKOMI moment in the Tsurukabuto Community from the 1950s. BOKOMI is a volunteer moment, with autonomous community groups, annually receiving 200,000YEN by the government for the activities of BOKOMI depending on the size of the community. Some BOKOMIs have bigger funds if the communities have private property business or timber business. The main members of these groups are people from local resident's association, women's association, senior citizen's associations, PTA Members, business members and local volunteer fire brigades

Kobe City Government provide assistance in terms of provision of disaster reduction machinery and materials, partial aid for activity expenses, training of trainer courses and other support measures which

[21] BOKOMI – Guide Book (Sharing Lessons Learned by the City of Kobe from the Great Hanshin-Awaji Earthquake) https://www.jica.go.jp/kansai/drlc/ku57pq000005kh18-att/01_bokomiguide_en.pdf

include dispatch of firefighters, volunteer fire fighters, fire engines and loan of disaster prevention equipment's to the disaster drills[22].

The disaster-safe welfare community not only carries out disaster risk reduction activities. But also welfare activities to encourage relationship building-between neighborhood residents with the main of creating groups which can help each other in time of emergencies.



Activities of BOKMI

ACTIVITIES	SUMMARY
Disaster Reduction Camps	Disaster reduction drills and overnight stays take place in elementary schools which also act as refuge shelters
Junior Disaster Reduction Teams	Junior high school students play a leading role in the formation of junior disaster reduction teams, carrying out various disaster reduction activates
Tsunami Evacuation Drill of 2 BOKOMIs	Seaside BOKOMI has evacuation drills to outside one BOKOMI area, hilltop BOKOMI
Evacuation Drill for Vulnerable Citizens	Gather information on vulnerable citizens in the local communities and implement evacuation and refuge shelter based on this information with schools
Community Hazard Map	Residents take walking tours of their local neighborhood creating a map of dangerous areas and local resources, etc.
Introducing BOKOMI to the WORLD	Kobe city government has created a training course 'community based disaster risk management ' with JICA which introduced activities of BOKOMI to Participants overseas.

SOURCE: BOKOMI, FIRE PRVENTION DIVISION, KOBE CITY

[22] BOKOMI – http://www.city.kobe.lg.jp/

Integrating Disaster Resilience Education in The Community

To achieve widespread understanding of the interdependence and fragility of ecological systems, long term education mechanism is essential that will lead to the adoption of new behaviors. This is important in the protection natural and water resources as well as in the human development in the Islands.

Furthermore, educating the public on the vulnerabilities, hazards and risks that they are exposed will provide the communities with better knowledge and risk reduction mechanisms and life improving self-help strategies in the face of new disasters.

UNESCO & UNICEF (2014)[23] has identified active learning approaches that can be adopted in developing and engaging student and community centered DRR and learning activities.

LEARNING TYPE	ASSOCIATED LEARNING ACTIVITIES
Interactive Learning	Brainstorming, pair and group discussion exercises, interactive multimedia presentations by students, teachers community members, DRR experts
Inquiry Learning	Individual and team case study research and analysis, project work, undertaking surveys and interviews, internet searching
Affective Learning	Sharing feelings, hopes and fears around hazards and disasters through multiple media
Surrogate Experimental Learning	Board games, digital games, role plays, and drama, simulation gaming
Field Experimental learning	Field visits to emergency management agencies, hazard mapping, hazard vulnerability and capacity assessments, transect walk, emergency drills and simulations
Action Learning	Student and community initiatives to raise hazard awareness, participating in DRR and resilience building initiatives
Imaginal Learning	Visualizing what to do in crisis situations, writing fictional stories

[23] Towards a learning culture of safety and resilience technical guidance for integrating disaster risk reduction in the school curriculum. Geneva, UNESCO/UNICEF

USE OF DISASTERS RELICS

Historically, with the intention of passing on lessons learnt from disasters, victims of disasters leave behind structures, natural objects, records, activities and information that the future generations can learn.[24] One form of disaster education or warning too was the disaster relics. Normally disaster relics are located in local familiar places where people could see. According to the white paper, Disaster Management in Japan 2016, published by the cabinet office gives an example of Miyako City, Iwate Prefecture.

In March 2, 1933, Miyako City was struck with an 8.4 magnitude earthquake which killed nearly 1522 people leaving behind many casualties and physical damages. Later named as Sanriku Earthquake, the survivors kept a stone stele inscribed with the lessons learned from the tsunami. Homes built on higher ground than this stone stele remained safe from the tsunami triggered by the 2011 Great East Japan Earthquake.

SOURCE: AGE FOTO STOCK, MIYAKO CITY

SOURCE: MARTIN FACKLER, THE NEW YORK, STONE TABLET IN ANEYOSHI, JAPAN TIMES (2011)

From the case of Miyako City, we know the importance of using relics to pass on the lessons learnt from disasters onto future generations to minimize the damage and loss of human lives. Not only Miyako City, but other cities practice this method dating back to centuries to warn the people who will live after them.

A similar stone tablet stands in Aneyoshi, a coastal village in Japan which inscribes ““Do not build your homes below this point!” and thus, faithfully the

[24] White Paper, Disaster Management in Japan 2016 (Summary) page 26

residents of Aneyoshi town have obeyed their ancestors warning[25].

However, with the modernization these relics are diminishing in Japan, these structures were a mean of disaster education. Fackler (2011) wrote in The New York Times, 'tsunami warnings, written in stone' For most Japanese today, the stones appear relics of a bygone era, whose language can often seem impenetrably archaic. However, some experts say the stones have inspired them to create new monuments that can serve as tsunami warnings, but are more suited to a visual era of Internet and television. Thus getting more attention from the public.

In the current era, to enhance the public knowledge on disasters require engaging and interactive methods of delivery. One method used by governments is citizen led initiatives.

Rising above the landscape the captivating design of the Tsunami Monument has a story to tell as well. The balls made of steel represent the twenty atolls of the Maldives, while the upward design is to show the mounting waters of the tsunami. At the heart of the monument are iron rods that have been placed vertically. Each of them signifies a life that was lost and the name of each victim is engraved on them.

TSUNAMI MONUMENT IN MALDIVES

[25] Tsunami Warnings, Written in Stone - https://www.nytimes.com/2011/04/21/world/asia/21stones.html

CITIZEN-LED INITIATIVES

The cabinet office of Japan, focuses on raising awareness of disaster risk reduction among the public due the frequent occurrence of natural disasters and the vast loss of people in the disasters. In Japan, under their 'Tsunami preparedness initiatives, formulating 'local disaster management plans' is taken as a high priority. Their rational behind is that, citizens must have an understanding of their surrounding before disaster strikes. In the model project (FY2016) conducted for 3 years, 23 of 44 districts drafted community disaster management plans and it was identified that an effective way to achieve this is for the citizens to independently formulate action plans and share them with their neighbors before disaster. Also to bring more community involvement, cabinet office of Japan decided to select model districts from among prefectures (municipalities).

Moreover, community disaster management plan forums, citizen's disaster preparedness council are some ways the cabinet office reaches to the public. In order to integrate DRR education, local citizens with different levels of awareness and interests in disasters were asked to participate in the meetings to investigate how to foster awareness during these sessions. According to the 'White paper on disaster management in Japan (2017)', a pre and post-project questionnaire of participants in the citizen's disaster preparedness council was conducted which asked how prepared they are for disasters. The cabinet office put together its findings from the trial citizen's council and compiled a list of similar examples. Which it published in March 2016 as the Guide to initiatives to increase awareness of disaster preparedness among local citizens via random sampling" where they hope that the guide will be used to promote initiatives aimed at increasing awareness of disaster preparedness among local citizens.

It is said that in the 10 minutes following Great Hanshin Awaji Earthquake (GHAE), a total of 54 fires broke out across Kobe. Firefighting and police support was unable to reach timely because of the collapsed buildings and high number of casualties. However, citizens proactive action in firefighting and rescue saved lives of many people. Mostly in mega disasters, victims are rescued by the neighbors with little or technical knowledge they have.

MAKING COMMUNITY PEOPLE MORE RESILIENT

Apart from these initiatives Japan government in making an effort to conduct disaster drills in accordance with the 2016 comprehensive disaster management drill framework, which prescribed the basic policy on conducting disaster management drills and details of the government ‘s comprehensive disaster management drills.

Different people define community in different ways. A group of people living in one place? A small society that shares same ideologies and goals? However, In Kobe City community size is defined as the size of an elementary school (Kaneko, 2018). And thus conduct disaster prevention activities in combination with other community activities, since more people will participate in the activities enabling to raise awareness of more people in the community about disaster prevention.

- Integration into welfare activities (welfare activities + disaster prevention activities)
- Integrating disaster element in the sports events at schools, colleges, offices
- Conduct disaster prevention programs using a community festival

CHAPTER 6

Disaster Management in Japan

Japan experiences the highest number of earthquakes and active volcanic incidents being located in the circum-pacific mobile belt (Ring of Fire)[26] where seismic and volcanic activities occur constantly because of the countries geographical, topographical and meteorological conditions[27].

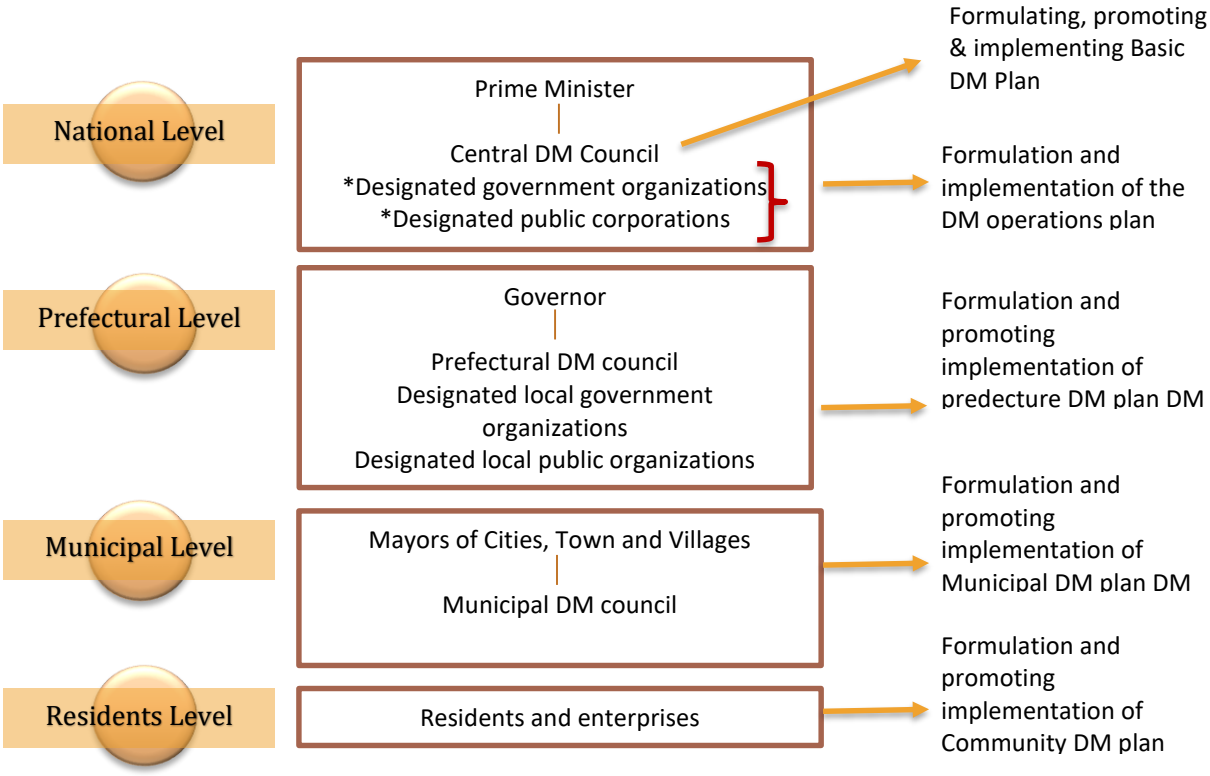
Over the years Japanese Government has made efforts to reduce the number of casualties in the large scale disasters. However, with laws and guidelines in place natural disasters remain a menacing threat to the safety and security to the people of Japan. The turning point for strengthening the disaster management system came in to effect in response to the immense damage caused by Typhoon Ise-Wan in 1959 which lead to the enactment if the Disaster Countermeasures Basic Act in 1961. Disaster Countermeasures Basic Act, addresses all the disaster management phases which includes prevention, mitigation, preparedness and response. Followed by the Disaster Countermeasures Basic Act, disaster management system has been reviewed with the lessons learnt.

Furthermore, after the catastrophic Great East Japan Earthquake, a new chapter was created in December 2011 for Tsunami Disaster Countermeasures and amendments were made in 2012 and 2014 January. Japanese government also bas a Basic act on education (1947, 2006) and School education act (1947)

[26] A precise geodetic survey in Japan, (1983)
https://www.sciencedirect.com/science/article/pii/0040195183901324

[27] Disaster Management in Japan, Cabinet Office, Government of Japan

Outline of The Disaster Management System



Designate Government Organizations: - 24 Ministries and agencies designated
Designated Public Corporations: - 66 organizations including independent administrative agencies, bank of Japan, Japanese Red Cross Society, NHK (Japan public TV Channel), Electric and Gas Companies and NTT (Telecommunication)

Source: Disaster Management in Japan, Cabinet Office

Application of Disaster Education in Japan

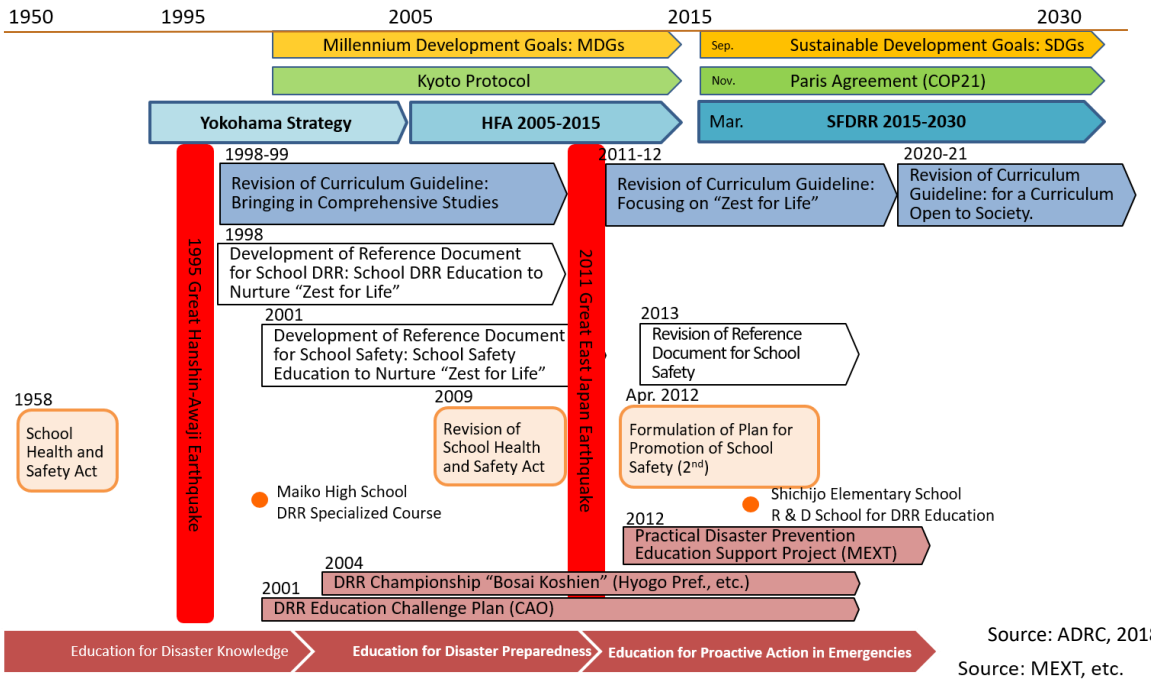
Discussed earlier in chapter 2, Case Study of Kamaishi City, Iwate Prefecture and Chapter 3, Case Study of Maiko High School, Maiko City. Application of disaster resilience education in Japan school system varies from prefecture to prefecture and school level.

Integration of Disaster Education in schools began in the early 1958 with the School Health and Safety Act. Over the years, more laws and regulations have been formulated and curriculum revisions made to strengthen disaster education in Japan.

Figure (11) describes the evolution of DRR education in Japan. With the lessons learnt from Great Hanshin Awaji Earthquake (GHAE), reference document ''Zest for Life" was formulated to enhance and nurture school DRR.

The course of study 'zest for life' by Ministry of education, culture, science and technology (MEXT). Is a 'broad standard' for all schools to organizes their programs in order to ensure a fixed standard of education throughout the country for kindergarten, elementary school, junior high school, senior high school and special needs school. It emphasis on the promotion of safety education and DRR topics to be included in existing subjects. I.e. Science, social studies, physical exercise, art, ethics and etc.

Evolution of school DRR education in Japan



Source: ADRC, 2018

Source: MEXT, etc.

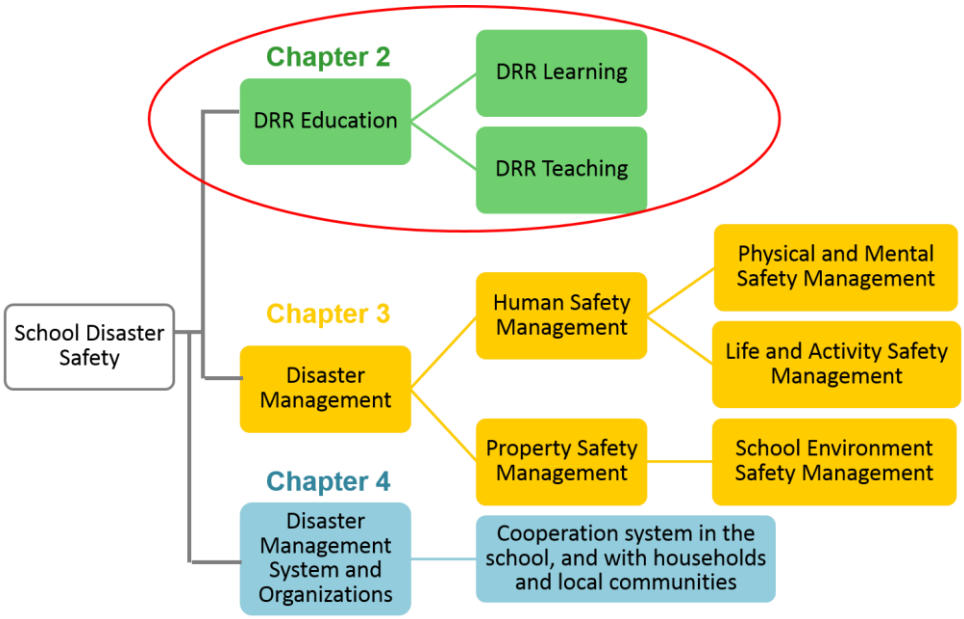
Reference document ''Zest for Life" can be taken an example for small island nation countries like Maldives, where the success stories and components could be integrated in to the education system for the betterment of the students and the community. Since Japan is a country with frequent disaster occurrence, the people of Japan learn from each one of those incidents and align their policies accordingly.

Components in the ''Zest for Life" guidebook is as follows: -

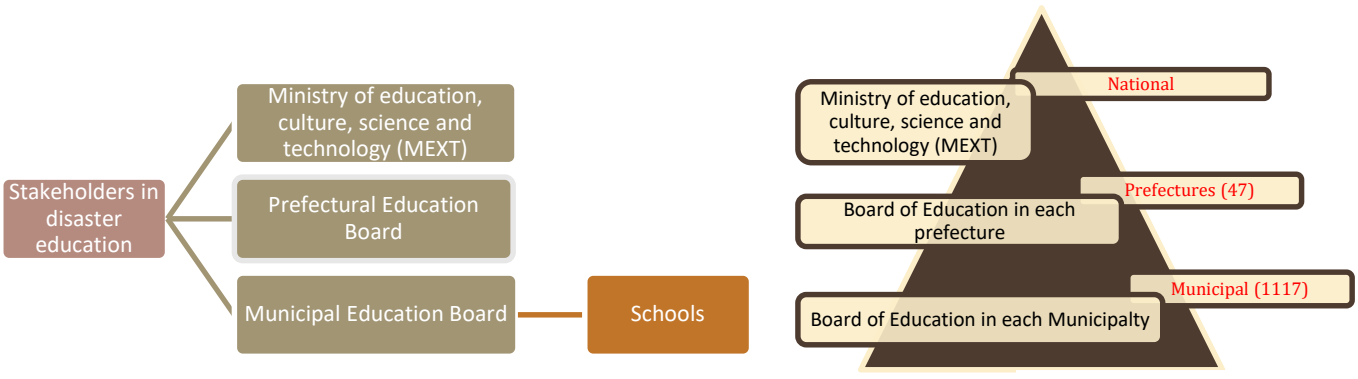
Chapter 1	Purpose and Objectives of School Disaster Risk Reduction (DRR)
✓ Purpose of School DRR	
✓ Challenges for Disasters and Promotion of the School DRR	
✓ School Safety and School DRR	
Chapter 2	**DRR Education in School**
✓ Safety Education and DRR Education	
✓ Objectives of DRR Education	
✓ Consideration for Promoting DRR Education	
✓ DRR Education in Subjects (Corse of Study)	
✓ DRR Education in cooperation with family and communities	
✓ Development of Teaching Plan for DRR Education	
✓ Evaluation of DRR Education	
Chapter 3	**Disaster Management in School**
✓ Disaster Preparedness (before disaster occurrence)	
✓ Emergency Management (in case of a disaster)	
✓ Disaster Response (after disaster occurrence)	
✓ Development of Emergency Management Manual	

Chapter 4	Systems and Organization for Disaster Management
✓ Establishment of Promotion System	
✓ Provision of Systematic Training for School Teachers and Staffs	
✓ Cooperation System with Households and Local Communities	
✓ Establishment of Promotion System	
✓ Provision of Systematic Training for School Teachers and Staffs	
✓ Cooperation System with Households and Local Communities	
✓ Establishment of Promotion System	
Chapter 5	**Examples of School DRR Education**

Components of the School DRR

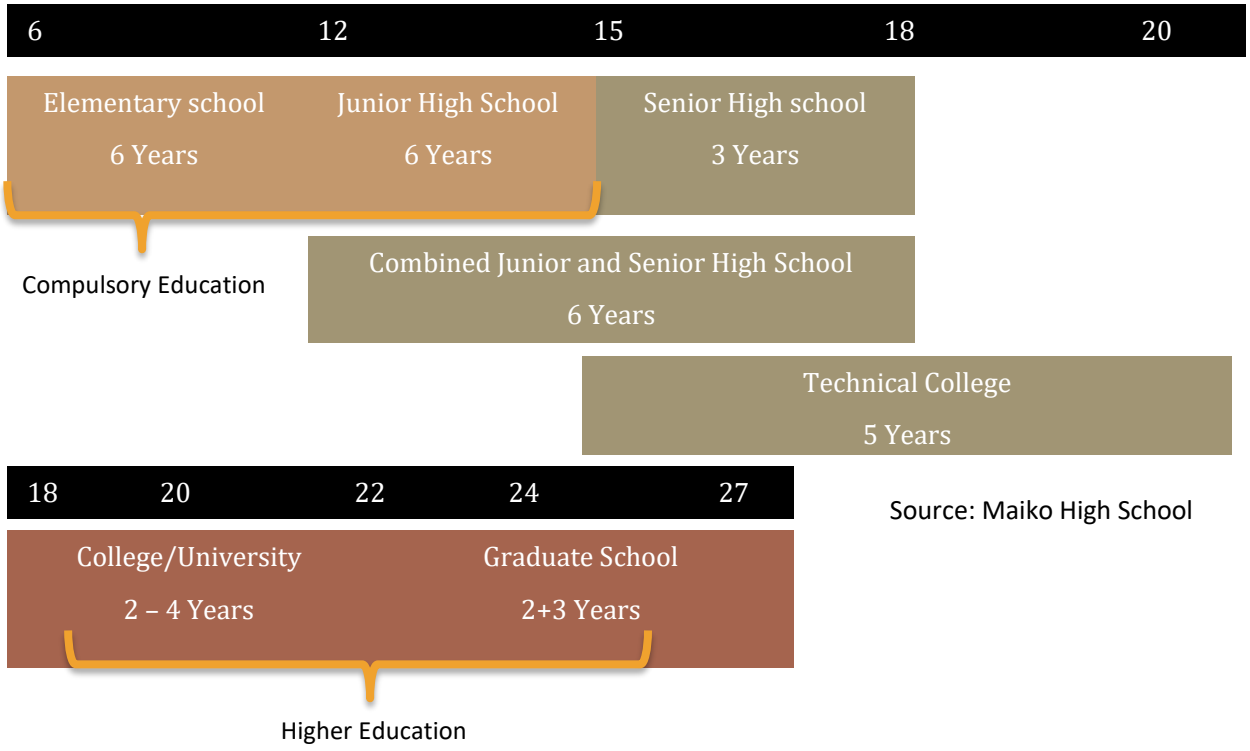


While Japan has 47 prefectures, each prefectural school education is based on their own prefecture and focus on hazards only prone to their areas. Also in each prefecture they have their own Board of Education. As for Kobe City, Kobe board of education and Hyogo board of education makes all the decisions related to the city's education system. The same mechanism applies for each prefecture in Japan.



Source: ADRC, 2018

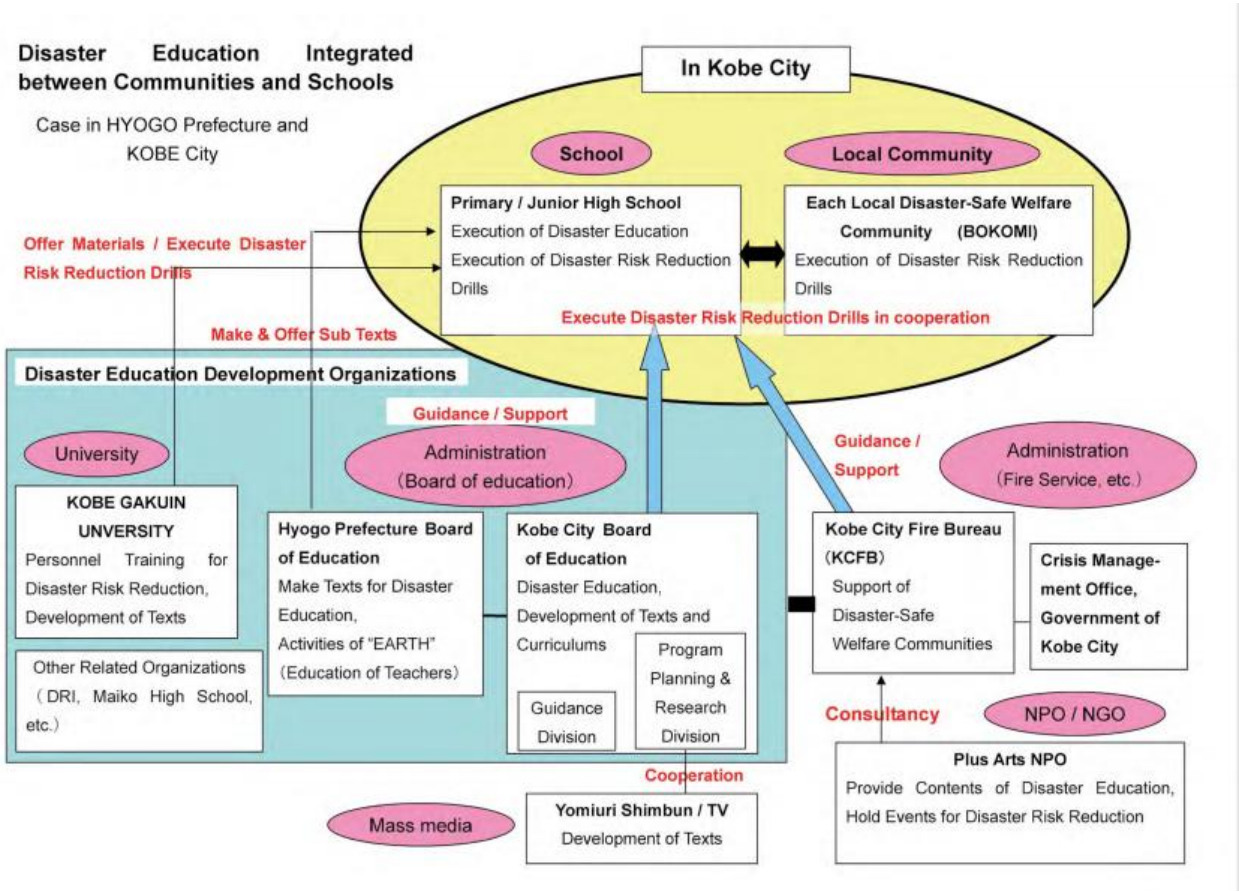
Japanese Education System



Source: Maiko High School

The Japanese Government in accordance with the disaster countermeasures basic act, every year submits to the National Diet (Japan's bicameral legislature, composed of a lower house called the house of representatives, and an upper house, called the house of councilors) report 'THE WHITE PAPER' which include overview of disasters occurring in Japan, and various statistical data and disaster management measured taken by the government and shared by other organizations and international agencies as well.

Disaster Education Integrated Between Communities and Schools[28]



SOURCE: BOKOMI GUIDEBOOK(PAGE10)

[28] BOKOMI – Guide Book (Sharing Lessons Learned by the City of Kobe from the Great Hanshin-Awaji Earthquake) https://www.jica.go.jp/kansai/drlc/ku57pq000005kh18-att/01_bokomiguide_en.pdf

CHAPTER 7

Conclusion

Based on the discussions above, it can be concluded that, incorporating disaster resilience into school curricula and community takes creative thinking and lot of planning. This also requires application of the basic principles for disaster resilience education as noted in the Implementation Handbook for Disaster Resilience Education at the Regional Level [29]

1. Learn about the problems and peculiarities of a community, as well as its past experiences in suffering disasters
2. Act on your own initiative, witness everything first hand
3. Setting smart and realistic goals
4. Be proactive in associating with key people in various fields and disciplines
5. Keep your approach positive, fun and light hearted

Disaster resilience should be included in the design, implementation and evaluation phase with the 6 key elements that includes people, governance, place, money, material and knack to get a positive output. Disaster resilience education would facilitate how the communities perceive DRR knowledge and can be used to change attitude, behaviors and values of those people.

[29] Implementation Handbook for Disaster Resilience Education at the Regional Level, Cabinet Office, Government of Japan

Recommendations

Based upon the best practices of Japan, its identified as a crucial element to enhance disaster management appreciation amongst teachers and the public to initiate an environment to influence and make an impact on disaster education to children more effectively by promoting a culture of disaster preparedness. In implementation of disaster resilience education in the Maldives, the following significant areas need has to be considered.

- Increase capacity of schools and students to respond to disasters.
- Bring needed changes to the curriculum and revise it, which would allow the students to be more independent make their own decision shifting from a teacher centered classroom to student centered class room.
- Children should also be exposed to real-life situations to make them more aware of the surrounding they live in, this would instill them with quick response and decision making skills which can be used in the event of emergencies and disasters. These exposure levels can be based on the developmental levels of the students.
- Produce effective Information, Communication and engagement materials (audio and visual aids)
- Career guidance should be provided to students from secondary level in order to inspire students and allow them to explore the different career paths available after secondary education.
- Apprenticeship programmes or work-based exercises should be integrated as part of the learning experience in schools.
- Incorporating DRR activities in the regular community festivals and occasions.
- Replicating activities like ‘’Iza! Kaeru Karavan”? / Disaster survival camps.
- Develop new strategies to incorporate public and children in disaster preparedness with the relevant stakeholders.
- Implementation of a structured DRE program in Maldives with extensive components of disaster resilience where the teachers, students and parents of those schools can be trained with guidance from NDMC, MRC and relevant agencies. Where they will be eligible to conduct programs by themselves in the long future while NDMC can monitor with event/program reports from schools to maintain the quality of the program.

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