

**Research Report
Sejahtera Fellowship Program
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Title:

Khushali/Mehfooz: Perspectives of Disaster Risk Reduction in School of Asia Pacific

(A Study to strengthen DRR preparedness in Asia Pacific Region)

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Abstract

Over the past few decades it is observed that disasters are doubled in terms of their frequency. Now the countries and the places which used to be in safer zone from disasters are also in experiencing the natural hazards. It is believed that most of the disasters occurring are the results are due to the effect of climate change. In addition vulnerability is also increasing and the people are exposed more to disasters due to inadequate preparedness to face the natural calamities. Priority to strengthen disaster risk reduction (DRR) preparedness is needed. DRR preparedness can play an essential role in saving the lives and livelihood of many people living in prone areas. Disaster risk reduction is defined by the International Strategy for Disaster Reduction (ISDR), a United Nations framework, as: “The concept and practice of reducing disaster risks through systematic efforts to analyses and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.” Apart from saving lives the DRR preparedness practices can reduce the huge economic loss faced by the government. The South Asian Association for Regional Co-operation’s (SAARC) Disaster Management Centre estimates gross domestic product GDP losses annually are between 2 and 20 per cent due to disasters. The outcome of disaster in addition to immediate deaths, damage and distress is poverty. The immediate impacts are compounded by the longer-term impacts on children by loss of assets, health and education, which in turn, increases the intergenerational damage done. Framework for DRR can be applied through education, training, research, knowledge development, risk awareness and assessment, application of science and technology. Reduction in disaster risk can not only achieve by preparedness and response but also by including prevention and mitigation.

Disasters can inhibit the progress of achieving Millennium Development Goals (MDGs) through reduction on effectiveness of aid investments and thus slowing the development progress. Repeated occurring of disasters is threatening the safety and security of population and impede socio-economic development efforts. Since 1990, natural disasters such as earthquakes, storms, volcanic eruption and forest fires have accounted for over 8 million deaths across the globe. In the years 2015, about 23000 people lost their lives and more than 110 million were badly affected and the economic loss estimated was around 70.3 billion. Asia Pacific region is accounted for most of the disasters occurring worldwide due to evolving of advanced technologies and thus are exposed to hazards. Asia pacific region is traversed by one-third of the world's subduction zones and are capable of producing the world's largest earthquakes and tsunamis. According to CRED, 2012 about 80% of global economic loss has occurred in Asia Pacific region. The trends of increasing exposure and greater losses associated with disasters demand a better understanding of their complex natures and the interaction of their foundation hazards, exposure, vulnerability and resulting risks.

Disasters and Children

The most vulnerable group recognized during disasters is children. Several global incidences have proven that the maximum emergencies during disaster are born by children. Countries such as India, Nepal, Myanmar, Indonesia, Japan, Iran, Iraq, and Jakarta have been highly affected. According to reports more than 35000 of school children were affected in some part of these countries. In Nepal an earthquake of magnitude 7.5 has disturbed 3.2 million children and nearly 8200 primary and secondary schools were destroyed. Myanmar have further witnessed floods which have abandoned 4,116 schools and 2,50,000 children while in Phillipines 8,472 schools were affected. Typhoon Koppu in manila displaced one million people and damaged 803 schools.

In India during Bhuj earthquake 971 students and 31 teachers died while 1,884 school buildings collapsed, 5,950 classrooms destroyed, and 11761 school buildings suffered major to minor damage. In Tamil Nadu (Kumbakonam) fire tragedy on 16 July 2004 killed 93 children, all below the age of 11 years. During earthquake in Kashmir 2005, around 17,000 children died and 2448 schools collapsed in Pakistan side of Kashmir, however no casualties were there in Kashmir in India. The June 2013 Uttarakhand, India flash floods and landslides displaced more than 150,000 people including over 65,000 children. Post effect of disasters is very tough especially on children. Development and well being of children get shattered and there occurs grief, emotional stress and scars in minds of children with the destruction of schools and other part larger community. Therefore safeguarding the students in the school from various disasters is our primary objective. The objective of my work was to ensure safety to the students in school from Asia Pacific specifically to India. On the basis of it a proposal on Khushali/Mehfooz: Perspectives of Disaster Risk Reduction in School of Asia Pacific was started. By the term 'school safety' we mean to develop preparedness and planning to prevent, mitigate, respond and recover from natural and man-made hazards that pose threat to school students and the entire school community. Safety of child also includes safety of all his other family members and friends, and safety all the time. Though named as 'School Safety', the programme covers DRR preparedness in schools as well as villages (residences) involving students and teachers and the community and Panchayati Raj Institutions.

Sejahtera fellowship 2017

The research work carried by the help of Sejahtera Fellowship 2017 to fulfil the objective of proposed proposal. Under this fellowship programme one has to carry our work from Sejahtera Centre in Tongyeong, Republic of Korea. Further details about this fellowship can be availed from

Sejahtera Centre website. I Dr. Apurva from RCE Srinagar's, recipient of the Sejahtera Fellowship 2017, recently completed the Sejahtera Fellowship programme during the period 13 October 2017 – 10 January 2018 in Tongyeong city, Republic of Korea. Run by RCE Tongyeong, the Sejahtera Fellowship programme brings together researchers from RCEs within the Asia-Pacific region every year for a period of three to five months to conduct research on Education for Sustainable Development (ESD). My proposal for the Sejahtera Fellowship 2017 was to strengthen Disaster Risk Reduction (DRR) Preparedness in the Asia-Pacific region through the RCE Network. Not only does education on DRR build relationships between society, culture, economy and the environment, it also empowers ESD through promoting critical thinking and problem solving whilst developing social and emotional life skills. Through this research, various schools and training centres were surveyed for their DRR preparedness. The schools and the training centres in question had been involved in various extracurricular activities to raise awareness and knowledge towards DRR preparedness in their community. Programmes conducted included mock drills, enabling the students to experience examples of potential situations during disasters whilst training them to build resilience. Education through media, TV programmes and reading materials (such as comics and cartoons) were introduced in class to educate the students on how to handle different circumstances during a disaster. The detail report of the project work can be obtained from the library of RCE Tongyeong Sejahtera Centre.

Outcome of Sejahtera Fellowship

As an outcome of the Sejahtera Fellowship 2017, a DRR Network was launched during the 9th ESD International Forum held at the Sejahtera Centre from 12-14 December 2017. The new network, working towards their motto of “Embracing each breath and celebrating life”, will be governed, monitored and headquartered at the Sejahtera Centre, supported by RCE Srinagar and

other RCEs. Amongst many activities, the network plans to: foster networking between the RCEs throughout Asia-Pacific and drive engagement in DRR, help RCEs to raise funds for their local and country-level DRR activities, develop advocacy material for use in relevant forums, develop training modules for DRR Preparedness in English (to be translated by RCEs if required), as well as consolidate existing DRR material submitted by RCEs to the Sejahtera library. In addition, the DRR Network is planning to organise a number of Asia-Pacific DRR Regional Meets over the next few years, hosted by RCEs within the region. It is anticipated the required funding to run the aforementioned activities will be raised within the first year, however in order to further strengthen the network, members will be asked to provide assistance on activities such as the development of advocacy materials, IEC materials, training contents, proposals and support for communication channels (phone calls, internet, web space, laptops and other software support).

The Centre for Environment Education (CEE), which hosts RCE Srinagar and five other RCEs in India, has been active in responding to all major disasters that have occurred in India during recent years. RCE Srinagar through its projects such as 'Mustaidi' (Being Prepared) and 'Mehfuz' (Well-being), is continuing to work towards DRR Preparedness, aimed at achieving 'Climate Smart and Disaster Resilient Communities'.

A video of the final presentation from Dr. Apurva on the outcomes from the Fellowship can be viewed here: <https://www.youtube.com/watch?v=IkpZ6nWuOM0>

Introduction

The need for disaster risk reduction in the face of increasing disasters. Disaster risk reduction is defined by the International Strategy for Disaster Reduction (ISDR), a United Nations framework, as: “The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.” The Asia-Pacific region is particularly vulnerable to disasters. According to the UNISDR’s Global Assessment Report on Disaster Risk Reduction of 2009, 75 per cent of global flood mortality risk is concentrated in only three countries: Bangladesh, China and India. Some 85 per cent of cyclone deaths are in Bangladesh and India. The region experiences over 50 per cent of the total global disasters, representing the largest and most disaster-prone area in the world, with a regular and increased frequency of typhoons, tsunamis, floods, droughts, fires and other natural hazards. This region accounted for over 70 per cent of the lives lost due to disasters. The South Asian Association for Regional Cooperation’s (SAARC) Disaster Management Centre estimates gross domestic product GDP losses annually are between 2 and 20 per cent due to disasters. The 2009 Global Assessment Report notes that it is rapidly growing developing countries that are more vulnerable to disasters because such development can lead to a growing concentration of people and economic assets in hazard-prone cities, fertile river valleys and coastal areas. Disaster risks increase if the exposure of people and assets to natural hazards increases faster than countries can strengthen their risk-reducing capacities by putting policy, institutions, legislation, planning and regulatory frameworks in place. Disasters impact poverty outcomes in addition to the immediate deaths, damage and distress. The empirical evidence shows that school enrolment tends to fall, and children may develop at a slower rate due to nutritional shortfalls following disasters. Evidence from Save the Child International confirms that children

are one of the highest risk groups (with over 175 million affected annually). The immediate impacts are compounded by the longer-term impacts on children by loss of assets, health and education, which in turn, increase the intergenerational damage done. Evidence is also beginning to emerge of the links between climate change and conflict, with a better understanding of the damage multiplier and risk-accelerator impacts of disasters and climate change on states with weaker governance or institutions (so-called fragile states). For example, the ongoing conflict in Afghanistan and more recent situation in Pakistan have prompted wider concern about the multiplier effects of disasters. While climate-driven disaster alone does not cause conflict, it can act as an accelerator of instability or conflict, placing a burden to respond on civilian and military institutions. The accompanying displacement of people and stress on government resources and legitimacy was predicted in earlier models of climate change-induced emergencies. Other drivers of disaster include complex emergencies and short-term human-made disasters, such as oil or chemical spills. Pandemics and epidemics can also drive wider disasters. Governments in the Asia-Pacific region are committed to disaster risk reduction through the Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters.

Definition of disaster risk reduction

The UNISDR defines disaster risk reduction as “The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.” The disaster risk reduction framework is composed of the following fields of action: risk awareness and assessment, including hazard analysis and vulnerability/capacity analysis; knowledge

development, including education, training, research and information public commitment and institutional frameworks, including organizational, policy, legislation and community action application of measures, including environmental management, land use and urban planning, protection of critical facilities, application of science and technology, partnership and networking and financial instruments early warning systems, including forecasting, dissemination of warnings, preparedness measures and reaction capacities. According to Living with Risk: A global review of disaster reduction initiatives, “It may be helpful to note that full disaster risk reduction includes prevention and mitigation rather than only preparedness and response. This is an important distinction helping to enhance the understanding of DRR as a development intervention and going beyond within the old disaster management paradigm.”

Disaster Risk Reduction (DRR) crosses multidisciplinary boundaries from fields such as health, urban planning, public policy, education and emergency management, and is the purview of a range of inter-governmental and non-government organizations (NGOs). Research from each field represents a range of different expertise, as well as varying purposes, audiences and goals. For instance, organizations, such as NGOs, collect data and produce publications to inform their constituencies and the public. As such, these organizations are often consumers rather than producers of DRR research, whose aim lies largely in promoting and guiding future actions in their respective fields amongst their primary audiences.

Impact of disasters

Natural disasters can significantly compromise development progress, reduce the effectiveness of aid investments, and halt or slow progress towards the achievement of the Millennium

Development Goals (MDGs). This presents a significant threat to development and has considerable implications for international aid programs. Globally, disasters both natural and manmade have become a very common phenomenon. Repeated disasters threaten the safety and security of population and impede socio-economic development efforts. Between 1900 and 2013, more than 6873 natural disasters were recorded worldwide, over 330 in 2014 and over 376 in 2015. Since 1990, natural disasters like earthquakes, storms, volcanic eruption and forest fires have accounted for over 8 million deaths across the globe. During 2015, worldwide more than 22,765 people were killed by natural disasters and another 110.3 million were badly affected. Moreover, the economic loss because of natural disasters during 2015 was estimated to be US\$ 70.3 billion.

The Asia-Pacific region accounted for more than 74% of global human fatalities from disasters between 1970 and 2011 (CRED, 2012). The regions in Asia Pacific is evolving with advanced technologies but are exposed to hazards. Incidence of the Fukushima nuclear in 2011 is one such example. Asia Pacific region is knowingly traversed by one-third of the world's subduction zones and are capable of producing the world's largest earthquakes and tsunamis. In 2005, tsunami provided a catastrophic reminder and the enormity of this single event took humanity by surprise. Major disaster events in 2011, such as the Great East Japan Earthquake and the following tsunami, as well as the severe floods in Thailand, provided stark evidence of the concentrated disaster risks that affect human well-being and future development in Asia and the Pacific. About 80% of global economic loss occurred in Asia Pacific (CRED, 2012). The trends of increasing exposure and greater losses associated with disasters demand a better understanding of their complex natures and the interaction of their foundation hazards, exposure, vulnerability and resulting risks.

Disasters in India

Owing to its unique geo-climatic and socio-economic conditions, India is highly vulnerable to natural hazards like floods, droughts, cyclones, earthquakes, landslides, avalanches and the forest fires. According to reports there occurred 4317 fatalities in 2015 and a total loss of 40 billion dollars due to extreme climatic conditions. However, the frequency common disasters reported from 1900- 2014 are floods (53.5%) > extreme temperature (10%) > landslides (8.5%) > earthquakes (3.3%) > others (2.1%). Moreover, maximum mortalities were caused by earthquakes (41.7%) > floods (31%) > storms (17.7%) > extreme temperatures (8.8%) > and others (1.8%). Accounting to economic loss; storms (23.1%) > earthquakes (7.1%) > drought (2.8%) > others (0.6%).

Disasters and Children

Children have been recognized as one of the most vulnerable groups during disasters. Globally several incidences across the world have provided evidence that maximum victims of disasters or emergencies are born by children. Countries such as Nepal, Myanmar, Indonesia and Vanuatu along with northern Jakarta have been highly affected. More than 351 schools and about 34,500 children were affected in some parts of these countries. In Nepal an earthquake of magnitude 7.5 has disturbed 3.2 million children and nearly 8200 primary and secondary schools were destroyed. Myanmar has further witnessed floods which have abandoned 4,116 schools and 2,50,000 children while in Philippines 8,472 schools were affected. Typhoon Koppu in Manila displaced one million people and damaged 803 schools. In India during Bhuj earthquake 971 students and 31 teachers died while 1,884 school buildings collapsed, 5,950 classrooms destroyed, and 11761 school buildings suffered major to minor damage. In Tamil Nadu (Kumbakonam) fire tragedy on 16 July 2004 killed 93 children, all below the age of 11 years. During earthquake in Kashmir 2005, around 17,000 children died and 2448 schools collapsed in Pakistan side of Kashmir, however no casualties were there in Kashmir in India. The June 2013 Uttarakhand, India flash floods and

landslides displaced more than 150,000 people including over 65,000 children. Post effect of disasters is very tough especially on children. Development and well being of children get shattered and there occurs grief, emotional stress and scars in minds of children with the destruction of schools and other part larger community.

Therefore safeguarding the students in the school from various disasters is our primary objective. The objective of my work was to ensure safety to the students in school from Asia Pacific specifically to India. On the basis of it a proposal on Khushali/Mehfooz: Perspectives of Disaster Risk Reduction in School of Asia Pacific was started. By the term 'school safety' we mean to develop preparedness and planning to prevent, mitigate, respond and recover from natural and man-made hazards that pose threat to school students and the entire school community. Safety of child also includes safety of all his other family members and friends, and safety all the time. Though named as 'School Safety', the programme covers DRR preparedness in schools as well as villages (residences) involving students and teachers and the community and Panchayati Raj Institutions.

Methodology

Selection of DRR research

Survey method

Selection and analysis of DRR research

Survey Method

General overview education in South Korea

In this part, I would like to describe about Korean education system in general and its issues. After I describe the Korean education dynamics, then I will go to inside about the DRR preparedness and design and its policy in Korea and the model of DRR in Korean schools through case study in Tongyeong city. Generally, Korean education system is centralized. The Korean government through Ministry of Education, Science and Technology develop, distribute and evaluate the national curriculum for the school. The national curriculum is revised every 6 years to 10 years by ministry of education, science and technology. The aim of this curriculum is to develop group of democratic citizens with strong moral and civic conviction. Korea also develops an initiative programme named as STEAM which consist of Science, Technology, Engineering, Art and Mathematic. The paradigm of Korean education has also changed from teacher centered learning to practice based learning and student centered learning. In order to support that learning method, Korean Ministry of Education is engages school autonomy. The purposes of this initiative is to give an opportunity to the school to develop school curricular based on school need and its environment as well as to reduce overload study, emphasizing practical skills and student's competencies.

Meanwhile, formal education structure in Korea divided into three levels. They are 6 years of elementary school, 3 years of Middle school and then followed 3 years of High school. They are moral education, Korean language, social studies, mathematics, science, physical education, fine arts, and practical arts. In Middle school level, the curriculum consists of 9 main subjects. In High school level, it is consist of 10 primary subjects and elective courses. Since the sustainable development need to be transformed into education, followed with Decade on ESD 2002, education paradigm in Korea dramatically changing, according to Korean National Commisiion

for UNESCO the role of ESD in Korea related with sustainability issues is centered on the survival and prosperity of Korean Peninsula. Recent policy in education shows that Korean government has also released guidebook for Middle school student and teacher on the importance of green growth education in the school in 2012. It means environmental education is not enough to accommodate sustainable development; it is also need to consider about green growth dimensions.

Case Study 1

DRR preparedness in Korean schools: Chung re yol girl's high School, Tongyeong, South Korea

A Chung re yol school is a girl's high school located at 70 Kyunnae- ro Yongnam – Myeon (53024) in Tongyeong city. The school was built on 20th January, 2005 and covers an area of 35,875 m². The total numbers of student studying in the school is 586 and are in between the age group of 16-18 years. The school is surrounded by the beautiful mountains and has a sea in front of it which gives a scenic beauty to the school. The slope of the school is quite high from sea level. The school has its own cafeteria and a big ground for the students to play or rest. The building is well architected with enough space for parking and open area. The school also has its own organic garden where they grow vegetable such as brinjal, tomato etc and other material with organic amendments. This garden is maintained by staff along with teachers and students also. While entering in the school there is a stoppage barrier being put so as to not allow the vehicles to go beyond it. A big parking area is built to park your vehicles. Next to the stopped barrier is a Cafeteria having enough space for the students to eat and enjoy. The school has a well developed system of waste management. There is a room made outside the school near to play ground where the organic waste are separated from other and is kept, which is further used as a fertilizer by converting it into

a vermicompost. Cheongreyol school is very strict on food wastage and they train their students not to have wastage.

As per our appointment we met with the school teacher responsible for DRR, and had an opportunity to interview her. During our interview with the Mrs. Dosun Hong, a senior social science faculty with extra responsibility of DRR preparedness who is serving this school from the last 23 years, I got to know that the school has been appreciated by UNESCO for saving energy and reducing its consumption from last year to the present year. She has been imposed the charge of DRR preparedness in school since two years. The school is certified and is appreciated by UNESCO for its green environment and energy saving efforts. As a result of it the school is also called as UNESCO school. In our questions of educational system she gives the structure which is described as below (Table 1)

Class/ grade	1	2	3	4	5	6	Total of grade
1	33	32	32	32	32	32	163
2	30	30	31	31	33	32	187
3	35	35	35	35	33	33	206

The slogan of the school is ‘Keep Doing Well’ and the main goal of school is to (1) strengthen education by studying as well as by learning; (2) create group of talented students; (3) enhance the personality built up to serve for nation, Korea. The school believes that “Through studying and learning, we cultivate talented people who can play a leading role in korea”.

1. 2 Disasters and its preparedness in Cheongreyol girl’s school

The building of school is seismically designed so as to prevent from Earthquakes. It is compulsory to have seismic design for all the schools in Korea. Among the major disasters in Tongyeong, Typhoons and Earthquakes are frequent. Typhoon is the major disaster of Tongyeong

province. Every year in the month of April, Tongyeong faces typhoons; however the intensity could be low or high but can cause hazards. However, earthquake was not frequent phenomenon few years back, but now since last two to three years the frequency has increased. According to Mrs. Dosun Hong, there were two earthquakes felt last in the year 2016 and the chance of its striking is increasing. However, the school is well aware of other disasters and has prepared it accordingly such as Fire, Flood, Tsunami, Building collapse etc.

DRR preparedness

The school organizes various training programmes for both the students as well as teachers. The teachers play an important role during any emergency in school. With this thought process, the teachers in Cheongryeol get trained once in year for risk reduction. It is compulsory to have 15 hours of training as well for the teachers in a year. As we know that the students are prima facia of the DRR preparedness as the risk of getting casualties is more to them. Therefore awareness and training programme for students are given more importance in Chengreyol. Along with the school authority the government organizations are also involved in training programmes. A Cheogreyol school has its own structure of DRR preparedness for students such as Mock drills. It is performed two times per semester every year to ensure safety of students from typhoons and earthquakes. In this activity it is announced that there is a earthquake strike or building collapse, so you all need to rush out as soon as possible and gather in the ground outside the school. The announcement is heard in every class through speakers installed in each class. As soon as the announcement was done the students are advised to get into the tables and cover their head with their books or anything which could protect them being hurt on head. Then they are asked to leave the class run through the exit gate to gather in a play ground. Once all the students gets collected in the ground outside the classroom, the teachers then asked them to line up and then they start

counting the number of students so as to ensure that no one is left in the classroom (Fig.). However, the students do not take it seriously but at least get an impression of risk management during emergency. The government organizations visit or instruct Cheongreyol through message about DRR preparedness once in a week. They make the student aware of the disasters and preparedness through manuals, reports and training, if required. For example, the officials from fire departments visit the school and give them knowledge about the preparedness of fire and training on how to deal in case of fire to both the students as well as teachers. Typhoon is the other very frequent disaster in Tongyeong. The school keeps its self updated by checking the broadcast from meteorological department about any typhoon. And if, there is any possibility of typhoon the students are informed and are asked to stay at their homes. The school building is designed in a way to minimize the effect of typhoon (Fig.). It has windows with double layered thick glass to absorb wind shocks. The walls are made of stones and brick on the side of typhoon to minimize the risk. In case of flood, the school is well protected as it is built at a higher altitude. Slope of the school is high and is built in way to keep the school up even at higher water level. It also has a good drainage system to make the seepage of water easy. Regular lectures are delivered and tips are given to students on flood management and preparedness. Extreme dipping of temperature is other problem in the country as the temperature reaches below freezing point upto -15 to -20°C is some part of Korea. However, in Tongyeong the winters are warmer than other regions. Here, the temperature in winters dips to about 2 - 3°C . The students wear thick uniforms and with good quality of jackets to ensure the safety. The classes are provided with thick glasses and a heating system to avoid cold.

In their DRR preparedness, the school has also appointed one nurse teacher so as to look the first aid possibilities as in Korea it is compulsory to have one nurse teacher in every school. Moreover,

in Cheongreyol the teachers are trained to perform specific tasks during emergency. The role of teachers is divided and each teacher has to perform according to her duty. Such as in case of fire it will be the responsibility of a particular teacher who has been trained for this specific task to call fire brigade, ambulance in case of casualties and even to carry important documents. The tasks are divided among the teachers so as to avoid confusions during emergency. According to Cheongreyol school the government organizations ask them to prepare task regarding DRR. The government gives information about a disaster and asks the school to make a report on their DRR preparedness and submit. On the basis of that government makes a plan as if how to strengthen the DRR preparedness in their schools and awards them accordingly.

Moreover, Government organisations issues book and manual on DRR preparedness. This book and manual is given distributed as one book in each class. Students really find it interesting as it is described by means of cartoon characters. In Korea 53 hours of training is mandatory in schools for DRR preparedness.

There are various other methods by which Cheongreyol school performs DRR preparedness.

- There are manuals prepared from government organizations mentioning the methods of DRR preparedness from various disasters.
- By performing mock drills of disaster, as discussed earlier
- Watching videos on disaster in different parts of world and methods of preparedness applied. Each class has a big LED TV installed to watch the videos and programme on DRR both from school as well as from government organizations.
- Through training classes on regular basis on DRR preparedness and by making them physically stronger by physical education teachers.

- Fire alarm and fire extinguisher are placed at every floor.
- Awareness and understanding through comics, cartoons, books.
- School is well provided with many exit gates to use during emergency with glowing signs to make it easy to find the gate even in dark.

An action-advice is made in case of building collapse and is given from school to students to avoid casualties

1. Signs of building collapse

- the floor of the building cracks or sinks
- the sound of a crack on a wall or floor cracks like ice
- Animal such as a dog suddenly barks or is unstable unlike usual.

2. When you are inside of building while collapse

- Close the gas Valve
- Never use elevator
- Don't be panic, look for an escape exit or shelter
- Escape to safe place with strong walls such as escape stairs and elevator hall.
- The injured person escapes to a safe place as soon as possible and takes first aid
- Find the items you need to escape, such as sturdier, rope, flashlight and so on.

3. When you are outside of building while collapse

- You should find the safe area from further collapses and gas explosions
- Don't approach near collapsed buildings which have potential danger such as further collapse, explosion, pieces of broken glass and fire.
- When you are walking near collapsed building, protect your head using heavy book, bag, and cushion.

4. When you are been buried under collapsed building.

- Do not spend physical energy by using unnecessary moving and shouting.
- Minimize dust absorption by covering mouth and nose with clothes

- Tap/Knock the wall or pipe regularly
- The waves of mobile phone can help the rescue so that turn on power of phone for certain regular period of time to save battery of phone.
- To maintain body temperature, look for some food and water with hope to rescue
- To prepare further collapse or fall, stay near strong wall and strong table to protect body or near window for inflow air
- Do not turn on matches, lighters as there is a risk of explosion caused by gas leak.
- When you get stuck from debris, have to move your finger and toe at anytime so that the blood circulates well
- When you are convinced that there are people around you, you should flash a flashlight, call out loudly, or tap the pipe to get the rescue team's attention.
- As thinking about your family, you will be able to have motivation to rescue.

Though the Cheogreyol school has a well prepared system of DRR preparedness but it has certain limitation which I found during my visit. Limitations are mentioned as below.

- Students are not serious while performing mock drills due to the virtual training programme conducted.
- Swimming is not compulsory in schools. Though, there is Sea near the school.
- No life safety jackets in the school

Pictures of Chengreyol School



Cheongreyol school campus



Curved shape of school building to minimise the effect of Typhoons;



Big open ground to be used in case of Disaster



Announcement room ; Students Hiding under table ; Running outside; Gathering in field for counting



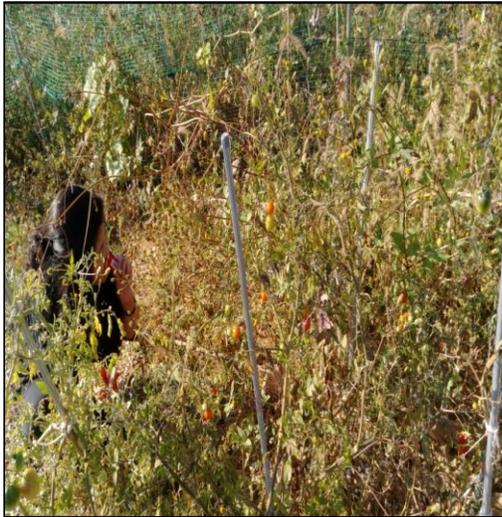
Tools of DRR preparedness in school (Mike; Fire alarm; Fire extinguisher; Room heaters)



Students watching videos and announcements from government officials on DRR preparedness



Segregation of wastes at student's level; Glowing sign showing emergency gates during dark



Organic field maintained by staff and students growing vegetables (Brinjal; Tomato)



Me with Mrs. Dosun Hong, a teacher and students discussing about DRR preparedness in Cheogreyol School



Me with Prof. Choi, A Marine Scientist, Gyeongnam National University in his chamber discussing on DRR



Me in lab of Prof Choi with his research scholar from Vietnam and discussing about DRR preparedness in lab

Case Study 2

Earth quake in Pohang, South Korea:

Tremors felt were second strongest on record

An earthquake of 5.4 magnitudes had struck Pohang at 2.29 P.M on 12th November, 2017. The epicenter was measured about nine kilometers north of Pohang and nine kilometers beneath the surface. The quake was followed by aftershocks of lesser intensity, including a 3.6 magnitude. Later, a 4.6 magnitude earthquake occurred 8 km's north of the city at south Gyeongsang province creating a fear of more tremors among citizens (Korean Metrological Administration; KMA). South Korea's state-run Korea Meteorological Administration said the epicenter of quake was inside Pohang while the US Geological Survey said it was centered about 9.3 kilometres (5.8 miles) northwest of the port city. The shaking was felt even in Seoul, more than 300 kilometres (186 miles) away.

The earthquake was South Korea's second strongest in decades since the country officially began monitoring them in 1978. The biggest quake occurred in September 2016, when a 5.8 magnitude occurred near the ancient city of Gyeongju, which is close to Pohang. That quake also caused injuries but no deaths. The recent earthquake damaged infrastructure, injured dozens of people and leaving about 1500 people homeless till date. According to the Ministry of the Interior and Safety 1,536 people had been forced to evacuate their homes and 57 people were injured. No deaths have been reported since the quake rattled the southeastern coastal region around the port city of Pohang. More than 1,000 houses and dozens of other buildings and cars were damaged or destroyed, however, cracks and other damage were found in military facilities, bridges, port facilities and water supply facilities. Images from media showed a crumbled wall piled on damaged cars, broken windows and cracks in buildings. The quake also forced the education ministry to put off the

university entrance exam for one week because some buildings chosen as test venues had cracks and students in the southeastern region were displaced from their homes and complained of anxieties. The annual test administered by the government is a huge national event in South Korea, where diplomas from top colleges often guarantee better jobs and spouses. This is the first time that the exams have been postponed in history of Korea.

Reacting to Pohang earthquake and following its consequences, the nuclear safety and security commission launched an emergency task force to monitor the safety of all 13 nuclear reactors across the country's southeastern region and around the cities of Busan, Ulsan and Gyeongju. Nuclear reactors in Ulsan, 80 kms south of Pohang, operated normally with no sign of radiation leaks according to Korea Hydro and Nuclear Power. The commission said no reactor suffered any damage due to earthquakes. Seven people sustained minor injuries due to earthquakes, two of them were serious. Fire departments have received dozens of calls from worried citizens in Chonwon city, 130 kms away from Pohang. However in Pohang fire departments had responded to 42 rescue calls, while 7000 were made nationwide to the emergency hotline 911. The earthquakes caused trains passing cities in the Gyeongsang provinces to slow down for minutes, delaying services for passengers. The Ministry of the Interior and Safety dispatched six officials to Pohang to monitor and oversee the quake struck zone. Photos from the city showed concrete debris, tiles, iron beams and glass falling into streets, destroying parked vehicles, brick walls and electricity poles.



Vehicles in Pohang, South Gyeongsang Province, got crushed by concrete slabs that fell from the top of a building next to them after a 5.4-magnitude earthquake struck the city on Wednesday afternoon

Handong Global University students evacuated the campus as the walls of a building crumble. People in Seoul reported they felt furniture and light fixtures shaking. According to the Ministry of Interior and Safety, no fatalities were immediately reported to the authorities. As of 5 p.m., 10 light injuries were reported in Daegu and the North Gyeongsang Province area. President Moon Jae-in was briefed on the earthquake on his way to Seoul from Manila, and convened a meeting with his senior aides immediately upon arrival. Moon returned from an eight-day tour of Southeast Asian nations. The Prime Minister Lee Nak-yon called on government agencies to roll out response measures according to the country's disaster relief manual, and highlighted the need to ensure the safety of nuclear facilities. Lee further said that "As with organizations concerned with disaster relief and damage assessment, nuclear power plants, and

related facilities must go into emergency operations until the situation is over,” in the emergency response center in Seoul. The Ministry of Interior and Safety put the emergency response headquarters into operation and dispatched officials to assess the situation and to oversee the response measures. Minister of Culture, Sports and Tourism Do Jong-hwan ordered concerned government bodies to assess cultural assets in the area for possible earthquake damages. Moreover, in response to the earthquake, Marines and special operations troops were mobilized support relief and cleanup efforts. According to reports, the earthquake shook buildings, causing books to fall from shelves and sending tremors to as far as Seoul and northern Gyeonggi Province. People on Jeju Island also reported buildings shaking, books falling from shelves and frames falling off walls. It also caused brief disruptions in internet and other communication services. In Pohang, about 100 residents of an apartment complex near the epicenter fled their homes to safer areas after the quake hit. Students at a nearby elementary school were seen evacuating classroom.



The earthquakes rattled Handong Global University campus in Pohang, destroying walls of one of the campus buildings



Products inside a supermarket in Pohang fell off shelves following the series of earthquakes.

Case Study 3

Earthquake In Iran-Iraq Is The Deadliest Of 2017

The earthquake struck on the border of Iran-Iraq struck in a populated region where more than 1.8 million people live. The border region between Iran and Iraq experienced the deadliest earthquake to on 12th November, 2017. The 7.3-magnitude earthquake is estimated to have killed between 530 and 580 people and injured another 7,460. The earthquake was felt as far as Kuwait, Qatar, Turkey, Lebanon, Israel and the United Arab Emirates. According to the US Geological survey, it hit late night with the epicenter in a rural area on the Iranian side of the border, just south of the Iraqi city of Halabja, which tracks earthquake activity around the world. The quake was at a depth of 23 km (just over 14 miles), which is considered shallow, according to the survey. It was felt across the region with aftershocks hitting Pakistan, Lebanon, Kuwait and Turkey, according to reports of news agencies in those countries. Iraq's Meteorological organization issued a warning on Iraqi state TV urging citizens to stay away from buildings and to refrain from using elevators. Most of the reported casualties are in Iran's western province of Kermanshah, nearby the epicenter of the earthquake. Search efforts are underway in the region, with rescue workers digging through rubble in an attempt to find any missing people. The earthquake has damaged the main hospital in the town of Sarpol-e Zahab that is being used to treat the thousands of wounded victims. In addition, it is estimated that 70,000 people in total will need some sort of shelter as a result of the earthquake's damage. Unfortunately, the damage was widespread in the Kurdish mountains where most of the homes are made from mud bricks and are not best suited to withstand an earthquake. The earthquake triggered multiple major landslides as a result of the shaking, which had made

rescue efforts more difficult in the mountainous region. Additionally, many people were forced to sleep outside or in incomplete buildings as nighttime temperatures dropped below freezing.



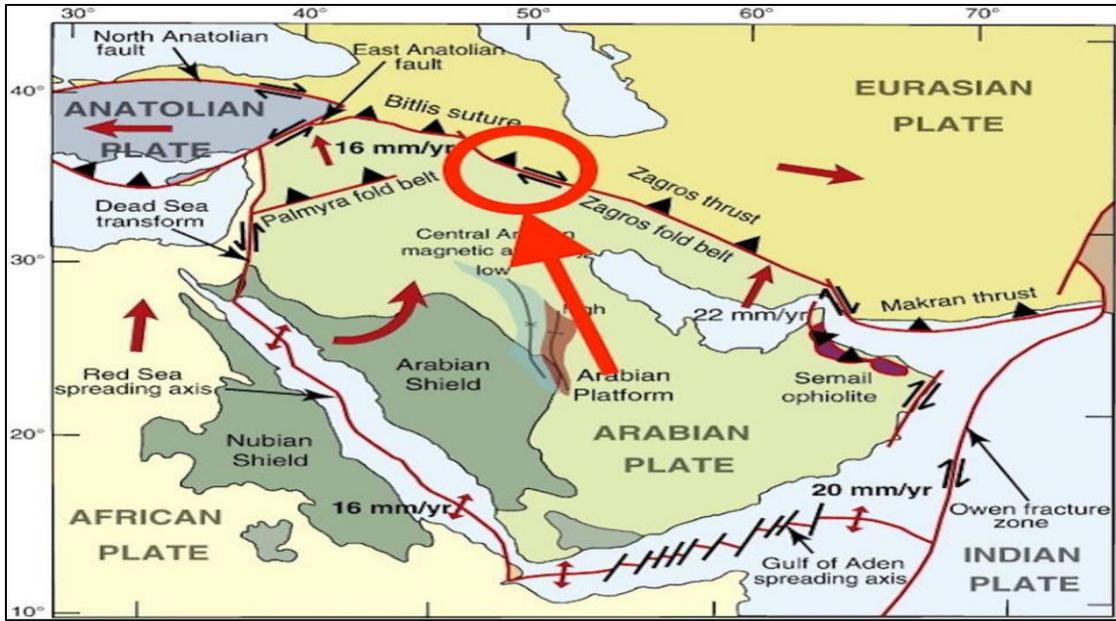
A woman mourns as she holds the body of her daughter, who died in an earthquake, in Sarpol-e-Zahab, western Iran, November 13, 2017.



A picture taken on November 14, 2017, shows a view of the buildings left damaged by a 7.3-magnitude earthquake that struck two days before in the town of Sarpol-e Zahab in Iran's western Kermanshah province near the border with Iraq, leaving hundreds killed and thousands homeless. / AFP PHOTO / ATTA KENARE (Photo credit should read ATTA KENARE/AFP/Getty Images)

Cause of Earthquake

The earthquake was a result of the collision of the Arabian and Eurasian plates. The Arabian plate is moving northward by a few centimeters per year, colliding into the Eurasian plate and producing the beautiful Zagros Mountains. This collision between two continental plates switches from a subduction to a strike-slip setting depending on specific location. In the region where the earthquake took place, the two plates are sliding against one another. The compression forces and friction induced from the two plates rubbing against one another have caused several major earthquakes in the region. This specific earthquake was a result of a reverse fault, where rocks are compressed and thrust up above nearby rocks. These fold and thrust belt, which has formed the Zagros Mountains, triggered a 7.8 magnitude earthquake in 1978 which killed at least 15,000 people. Further to the south where the boundary between the plates is a subduction has experienced major earthquakes and tsunamis. In 1945 a magnitude 8.0 earthquake produced a tsunami that combined killed more than 4,000 people. The recent Iran-Iraq earthquake was felt as far away as Turkey, Israel, and Kuwait. While the death toll continues to rise, it is already the deadliest earthquake in the world in 2017 and the deadliest to strike Iran since 2012. Unfortunately, earthquakes will continue to occur in this region as the Arabian plate continues to push up against the Eurasian plate. Hopefully, preparation is underway to learn from this tragic event and rebuild stronger and better than before.



Tectonic setting of the Iran-Iraq earthquake showing the Arabian and Eurasian plate collision



Iranians salvage items from damaged buildings in the town of Sarpol-e Zahab in the western Kermanshah province near the border with Iraq, on November 14, 2017, following a 7.3-magnitude earthquake that left hundreds killed and thousands homeless two days before

Casualties and Extensiveness of damage

The majority of victims were Iranian. IRNA, the country's state news service, said on Tuesday that at least 530 people were killed and 7,817 were injured. Officials in Kermanshah said most of the Iranian deaths were in the town of Sarpol-e Zahab where 236 people died. At least 10 people killed in Iraq. According to Iraqi Red Crescent 10 people were killed in Iraq's northern province of Sulaimaniyah, and 430 people were injured there. Though tremors were felt beyond Iraq and Iran, however there were no injuries reported in neighboring countries. Small magnitude earthquakes have continued to hit around the area as an earthquake of magnitude 4.3 was felt near Sarpol-e Zahab in Iran. Emergency has been declared in Sulaymaniyah, Iraq to assess the aftermath, according to local Kurdish media. Iraq's meteorology centre advised people to stay away from buildings and elevators, in case of aftershocks and residents were told to sleep outside their homes as precautionary measure. The most extensive damage was in the town of Darbandikhan, southern Sulamaniyah. The Iranian Red Crescent said more than 70,000 people needed emergency shelter. It is difficult to send rescue teams to the villages because the roads have been cut off as there have been landslides, said Iran's emergency services chief, Pir Hossein Koolivand. IRAN has send 30 Red Cross teams to the quake zone. Several cities have been cut off from electricity, schools in Kermanshah and Ilam provinces closed, and three days of mourning have been announced. Oil pipelines and refineries in the area remained intact.

Iranian President Hassan Rouhani planned to travel to Kermanshah to oversee rescue work on according to Iranian state TV reports. The country's interior and health ministers went to supervise the rescue operations. Iraqi Prime Minister Haider al-Abadi has instructed civil defense teams and health and aid agencies to do all that they can to provide assistance to those affected by the quake. Meanwhile in Iran, the country's Supreme Leader Ayatollah Ali Khamenei sent a message of

condolence and urged military and civilian help to be dispatched to quake victims. Iran's Revolutionary Guard was reportedly traveling to the affected areas to help with rescue efforts, according to Iran's semi-official Tasnim news agency. The Iranian Red Crescent Society was working in the hard-hit areas with sniffer dogs, debris-removal teams, and teams offering emergency shelter and treatment, said Mansoureh Bagheri, a spokeswoman for the Iranian Red Crescent in Tehran. More than 500 villages in the region suffered damage (CNN report). In Iraq's semi-autonomous Kurdish region, four people were killed in Darbandikhan, while a dam was hit by falling rocks. Rahman Shikhani, the head of the Darbandikhan Dam, told CNN that cracks were spotted in the upper part of the structure but there was no water leakage. According to the reports from eye witness Majida Ameer, who lives in the south of Baghdad, said she ran to the streets with her three children after the quake hit late Sunday. "I was sitting with my kids having dinner and suddenly the building was just dancing in the air," Ameer told Reuters. "I thought at first that it was a huge bomb. But then I heard everyone around me screaming: 'Earthquake!'" Pourya Badrkhani, a music teacher in Kermanshah, Iran, told CNN he was sitting at home watching television when the quake hit. Badrkhani said he rushed out of his home along with his family and joined neighbors on the streets. He said people were donating blood to help the injured while others have volunteered to go and help the border cities, which he says were the worst affected.

Reactions from World Forum

President Rouhani visited earthquake-hit Sarpol-e Zahab and said that he wholeheartedly sympathise with all the injured and the victims of this disaster, and ask the Almighty for mercy for those who lost their lives, swift recovery for the injured and patience and health for those fellow Iranians who lost their beloved one. Ayatollah Khamenei, the country's supreme leader, said: "During these past two days, officials, including the president, visited and expressed their

sympathy for the survivors. I hope that these sympathetic attitudes continue, in practice, effectively helping the people; and, I hope they can reduce the pain and sufferings of the people, considering the cold weather is upon us." Turkey was the first country to offer aid through its Disaster and Emergency Management Presidency, announcing that 92 rescue personnel were on standby, together with 4,000 tents and 7,000 blankets.^[29] EU Foreign Policy Chief Federica Mogherini said the bloc was ready to cooperate with Iran in providing emergency relief aid and Italy's government issued orders to send 12 tonnes of tents, blankets and mobile kitchens on 13 November.^[30] Russian President Vladimir Putin sent a message of condolences to his Iranian counterpart Hassan Rouhani. Russian Emergency Minister Vladimir Puchkov also sent messages of condolences and said they are ready to help the two countries deal with the consequences of the natural disaster. "The United Nations stands ready to assist efforts to respond to the deadly earthquake that struck Iran and Iraq on Sunday," Secretary-General Antonio Guterres has said. Iran: 445 people confirmed dead, 7,100 injured, Iran's Press TV has reported Monday afternoon. Northern Iraq: 7 people dead in the semi-autonomous Kurdish region, said Rekawt Hama Rasheed, the health minister of the Kurdish Regional Government. Iraq's health ministry added that 535 people were injured. Rescue efforts: Authorities in Iran and Iraq have initiated rescue operations; Iran has declared three days of mourning. The International Committee of the Red Cross had arrived by 13 November.^[30] Sunni charities, such as the Iranian Call and Reform Organisation, were providing tents and water.^[9]

Previous earthquakes

Iran sits on a major fault line between the Arabian and Eurasian plates and has experienced a number of earthquakes in the past. The deadliest this century occurred in 2003 when a magnitude 6.6 earthquake struck the southeastern city of Bam, killing some 26,000 people. Over a decade

earlier, in June 1990, an estimated 37,000 people were killed and the northern cities of Rudbar, Manjil, and Lushan were destroyed along with hundreds of villages. In 2005, a 6.4 magnitude earthquake rocked the city of Zarand in the southeastern province of Kerman, killing at least 400 people, and in 2012 a pair of earthquakes jolted northwest Iran, killing at least 300 people.

Post disaster Images of earthquake







FERIO FEREC/ANADOLU AGENCY/GETTY IMAGES



POURIA PARKIZ/ANADOLU AGENCY/GETTY IMAGES



FARZAD MENATI/AFP/GETTY IMAGES



FELIPE DANRAB



FARZAD MENATI/AGENCY IMAGES



ABEDINI/TAHERKENAREH/EP-A-EFE



DRR Policies in Korea

By the nature, Korea is the country where four distinct seasons characterized by many arid days in spring and fall, substantial rain in summer and much snow in winter. Under these circumstances, Korea is especially vulnerable to floods and typhoons each year. In fact, the fighting with natural disaster such as torrential rain and typhoons is the major task in emergency management in Korea. In twenty-one century, not only for natural disasters but also the man-made disasters such as fire, building collapse and oil spills occurred in Korea and these major events has the key mover for shaping the emergency management system in Korea. With the experience of fighting against the water-related disasters, Korea developed a unique emergency management system which mainly suits to the natural disasters since 1960. In the emergency management field, more than 70 laws and regulations in emergency and disaster management have been enacted since the establishment

of the Korean government at the beginning of the 1950s. For example, the ‘Flood Disaster and Relief Act’ was passed in 1967 and the ‘Flood with Typhoon Countermeasure Act’ was established and it included the management of earthquakes, droughts, and flood with typhoon. This ‘Disaster Management Act’ was passed after combining aspects of the ‘Architecture Act’ and the ‘Firefighting Act’ in 1995. Back then, the individual law was managing each types of disaster and this creates the fragmentations of responsibilities and redundancy in the government. Due to the the collapse of the Samping department store served and Daegu Subway Arson occurred, the Korean government began to comprehensively manage disasters by establishing the “Emergency and Safety Management Basic Act” in March 2004. The Korean government tried to manage social emergencies including those relating to critical infrastructure and key resources as well as natural disasters and man-made emergency through this Act. The Daegu subway arson incident in 2003 worked as the impetus for passing this law. As stated earlier, since Korea built the disaster management around the natural disasters and however Korea is now facing complex, multi, compounding and natural disasters. Apparently, the disaster and safety management basic law are clearly stated that there are three different types of disasters exist in Korea: natural, social and overseas disasters.

Case study

Recent Disaster in Korea in December

South Korea sauna fire: At least 29 dead in major blaze at Jecheon fitness centre

It was unclear what caused the fire but it likely began at the building's car park, officials say

A fire broke out 21st December, 2017 at an eight-story building in the central South Korean city of Jecheon, killing 29 people and injuring 29 others. A Jecheon fire department official said the toll could rise as rescuers continue to search the building after putting out the fire. Many of the people who died had been using a public bath on the second and third floors, which made it harder for them to escape. Organisers for the Pyeongchang Winter Olympics said the Olympic torch relay had been scheduled to pass through Jecheon on Friday, but the route has been revised because of the tragedy. Local media showed firefighters battling the blaze with trucks and helicopters, and a man jumping from a window as firefighters held a mattress below. It was unclear what caused the fire but it likely began at the building's parking lot, according to fire officials. The building had several restaurants and leisure facilities, including a gym, the public bath and an indoor golf practice facility. According to sources the fire vehicles found a tough time to reach the spot of fire and thus caused the fire to break out more. The reasons observed were the organized parking of vehicles on road which had left no space for fire vehicles to reach the spot immediately.



The building had several restaurants and leisure facilities, including a gym, the public bath and an indoor golf practice facility



Emergency services at the scene where 29 people died and dozens more were injured in a fire that engulfed a commercial building in the southern city of Jecheon



A victim is carried by firefighters



Firefighters examine the burned building

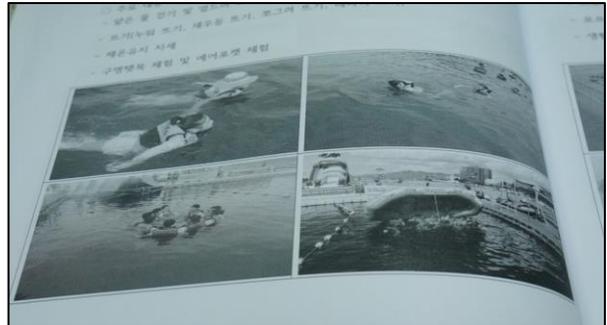
Tongyeong Marine Centre.

Sea Explorers of Korea is the nation's foremost youth organization and champion of South Korea maritime experiences that connects us all. It is located at 194 Balgae-no, Tongyeong city. The Marine centre was opened on 17/ 12/ 2003. The total area of the centre is 6100 m² and it occupies 3529 m² for training and 2571 m² for accommodation. The total maximum occupancy is for 430 people. The centre provides various facilities such as accommodation, feeding, additional, sport, marine etc. About 220 people can eat together in the cafeteria while in their additional facilities it has a play area lecture with discussion room. In their sports activities they have a basketball court while in the marine activity they have a marine floor sea training area. They also have a nurse office and a book café with outdoor stage. The association is a not for profit organization dedicated to maritime preservation and education in order to enhance public understanding, appreciation and enjoyment of our nation's rich maritime heritage. For over thirty- eight years, membership in Sea Explorers of Korea has been an honor, a privilege and a challenge. Joining the organization, you become a part of a community of about 150,000 other young members and a part of tradition of excellence. As members of Sea Explorers of Korea, you will progress from following to leading others, and advance with a sense of honor, pride and duty that will remain them through their lives. But most importantly, Sea Explorers of Korea, through its unique combination of wide ranging programme of exhibits, group events, and maritime related educational programmes, seek to create a broad understanding to youth of the historic and continuing relationship of Korea and the Sea, The sea which they believe has affected their lives and inspired Korean art, music, and literature. Sea Explorers of Korea bring the relationship to life through on site demonstrations, role -playing, and educational activities appropriate for members of every age and back ground. Young members

practice age- appropriate interdisciplinary skills while discovering the importance of the sea in Korea history. Sea Explorers of Korea takes pride in its varied programmes for members and support services for communities. The current offerings and how to become part of a proud tradition are explained below.



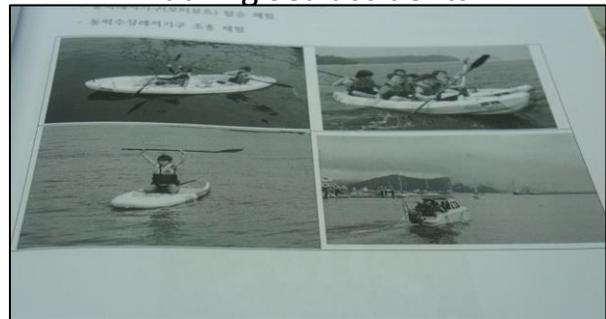
CPR Training in case of emergency



Swimming practices during Sea accidents



Muster Station, a collection point to gather during emergency



Training of using side boats

Courses of Education and Training

Training Curricula	Special Training Options			
	Exploration & Pioneer Corps	Advance Corps	Navigation Corps	Ocean Corps
Basic Education	-History of S.E.K., Basic etiquette, Preparation before 5 minute, Close-order drill - Uniform regulation, Promotion system, Responsibilities and duties, Manners of life. - National anthem, SEK song, Provisional song, City, County song, School song, Navy song Basic education as a junior leader – Programme only for College or University			

Marine Education	<ul style="list-style-type: none"> • River and Sea • Current • History of the ship • Constellation • Wind and wave • Hobour • Living things at seaside • Specimen collection 	<ul style="list-style-type: none"> • Deep Sea • Marine resources • Diving • Marine development • Earth science 	<ul style="list-style-type: none"> • Art of Navigation and engine • Marine development 	<ul style="list-style-type: none"> • How to guide the art of navigation and engine •
Skill Training	<ul style="list-style-type: none"> • Flag signaling • Study tour on the ship • Swimming • Rigging and its use • First aid and life saving • Small boat handling • Boxing the compass 	<ul style="list-style-type: none"> • Experiencing sailing on board • Rigging and its use • Artificial respiration • First aid on the sea • Boxing the compass • Small boat handling 	<ul style="list-style-type: none"> • Surveying technique • How to make chart • Art of navigation 	<ul style="list-style-type: none"> • How to guide skill training
Group Training	<ul style="list-style-type: none"> • Basic gymnastic • Special gymnastic • Sea training • Camping • Recreation 	<ul style="list-style-type: none"> • How to survive • How to manage meeting • Skin SCUBA training 		<ul style="list-style-type: none"> • How to guide youth • Psychology of the youth
Creation Activity	<ul style="list-style-type: none"> • Composition • Assembling model ship • Operating computer • Playing musical instrument • Painting 	<ul style="list-style-type: none"> • Manufacturing creative ships 		<ul style="list-style-type: none"> • Leadership training
Service Activity	<ul style="list-style-type: none"> • Various service activities for communities • Finding our root (Study tour of historical sites, studying of regional special products, culture etc) • Making knowledge extended (learning of other groups, religional activities, Making foreign friends) • Study activities (nature observation, study of marine life, inland waters and ecology etc.) • Mental education (Practice of love through honesty, sincerity, faith, cultivation of the mind) 			

DRR Preparedness



Discussing DRR preparedness with Mr. Joe, Director Tongyeong Marine Centre



Looking DRR preparedness with Mr. Joe



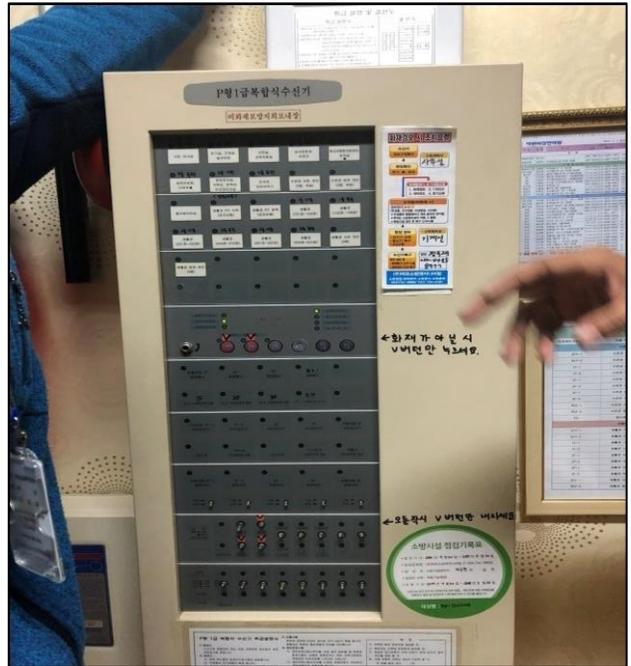
Disinfectant killer
(Water saving technology)



Long distance torches



First Aid Kit



Position finder in case of fire emergency



Emergency lights will keep lighting for one hour in case of shut down.



Medical kit in case of Emergency



Portable CPR



Stretcher for patients



Descending Life Line



Helmet with lights to help during building collapse



Gas plant room with extra door to avoid misshaping



Big Fire extinguisher near gas plant room