

YANGON UNIVERSITY OF ECONOMICS
MASTER OF PUBLIC ADMINISTRATION PROGRAMME

**A STUDY ON KNOWLEDGE, ATTITUDE,
PREPAREDNESS AND PROTECTION OF DISASTERS
IN AYEYARWADY REGION
(CASE STUDY: HINTHADA TOWNSHIP)**

Theingi Soe Naing
EMPA-65 (15th BATCH)
OCTOBER, 2019

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REGION**

(CASE STUDY: HINTHADA TOWNSHIP)

A thesis submitted as partial fulfillment of the requirement for the degree of
Master of Public Administration (MPA) degree

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This is to certify that this thesis entitled “**A Study on Knowledge, Attitude, Preparedness and Protection of Disasters in Ayeyarwady Region (Case Study: Hinthada Township)**” submitted as a partial fulfillment towards the requirements for the degree of Master of Public Administration has been accepted by the Board of Examiners.

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ABSTRACT

This study assessed the community knowledge, attitude and preparedness on disasters in Hinthada Township. The objectives of the study are to assess on knowledge, attitude and preparedness and to examine the prevention/protection of disasters in Hinthada Township. In this thesis, descriptive method is used with primary and secondary data. Primary data is collected from Key Informant Interview (KII) and secondary data is obtained from Department of Disaster Management, Department of Disaster Risk Management, Township Disaster Management Committee, Asian Disaster Preparedness Center (ADPC), United Nations Organizations as well as related references from internet websites. The survey found that floods and storms are the major disaster for township. This study indicates that it is primary responsibility for the State to protect its people and their property from all kinds of hazards. However the people at community level also need to be aware of the risks of the hazards and to be equipped with the capacity to be prepared and secured from the potential disasters. It is essential to use proactive emergency preparedness management which is Community Based Disaster Risk Management (CBDRM) approach rather than reactive disaster management which is traditional approach. It is found that preparedness is important in disaster risk reduction at both the state level and community level.

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ACKNOWLEDGEMENTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
CHAPTER I INTRODUCTION	
1.1 Rationale of the Study	1
1.2 Objectives of the Study	2
1.3 Method of Study	2
1.4 Scope and Limitations of the Study	2
1.5 Organization of the Study	3
CHAPTER II LITERATURE REVIEW	
2.1 Definitions of Hazard and Disaster	4
2.2 Characteristics of Hazard and Disaster	5
2.3 Concepts of Disaster	8
2.4 Disaster Management Cycle	9
2.5 Components of Disaster Preparedness	10
2.6 Community Based Disaster Management Approach	12
2.7 Recovery on Disasters	13
2.8 Reviews on Previous Studies	15

CHAPTER III OVERVIEW OF DISASTERS IN MYANMAR

3.1	Definition and Concept of Disasters	17
3.2	Effects of Disaster	22
3.3	Community Based Disaster Risk Reduction Policy	22
3.4	Institutional Arrangements for Disaster Risk Reduction	24
3.5	Disaster Management Communications	27
3.6	Educative Measure for Public Awareness	30

CHAPTER IV SURVEY ANALYSIS

4.1	Survey Profile	33
4.2	Survey Design	35
4.3	Survey Findings	36

CHAPTER V CONCLUSION

5.1	Findings	46
5.2	Recommendations	47

REFERENCES

APPENDIX

LIST OF TABLES

Table No.	Title	Page
2.1	Timing and Predictably Classifications of hazards	6
2.2	Natural Disaster Classification	8
3.1	Hazard Profile of Myanmar	20
3.2	Public Awareness, Education and Training	31
4.1	Number of Respondents in Each Ward and Village	36
4.2	Demographics Characteristics of Respondents	36
4.3	Respondents' Knowledge on Disaster	37
4.4	Respondents' Disaster Preparedness Knowledge	38
4.5	Respondents' Experienced Disaster Types	39
4.6	Needs of Disasters Preparedness Plan	40
4.7	Knowledge of Disaster Plans	41
4.8	Disaster plans among family members	41
4.9	Receiving Disaster Information in the past 12 month	42
4.10	Respondents' participations for drills	43
4.11	Usefulness of drills	43
4.12	Township and village practice drills	44
4.13	Knowledge on evacuation	44
4.14	Disaster knowledge and training for school children	45

LIST OF FIGURES

Figure No.	Title	Page
2.1	Disaster Management Cycle	10

LIST OF ABBREVIATIONS

AADMER	ASEAN Agreement on Disaster Management and Emergency Response
AHA	ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management
ASEAN	Association of Southeast Asian Nations
ADPC	Asian Disaster Preparedness Centre
ASDA	Ashoka Social Development Association
CBDRM	Community Based Disaster Risk Management
DDM	Department of Disaster Management
DMC	Disaster Management Course
DMTC	Disaster Management Training Centre
DRR WG	Disaster Risk Reduction Working Group
GoM	Government of Myanmar
IEC	Information, Education and Communication
IFRC	International Federation of Red Cross
MAPDRR	Myanmar Action Plan on Disaster Risk Reduction
MCCDDM	Myanmar Consortium for Capacity Development on Disaster Management
MSWRR	Ministry of Social Welfare, Relief and Resettlement
NDMC	National Disaster Management Committee
NGO	Non-Governmental Organization
PSI	Population Services International
RRD	Relief and Resettlement Department
ToT	Training of Trainers

UNFPA	United Nations Population Fund
UN-Habitat	United Nations Human Settlement Programme
UNICEF	United Nations International Children's Emergency Fund
UNISDR	United Nations International Strategy for Disaster Reduction
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNDP	United Nations Development Programme
WASH	Water, Sanitation and Hygiene

CHAPTER I

INTRODUCTION

1.1 Rationale of the Study

Myanmar is exposed to natural disasters such as flooding, drought, earthquakes, cyclones, and communicable and infectious disease outbreaks. Myanmar ranks as one of the most vulnerable countries to the effects of climate change and the impacts of natural disasters are expected to increase in the immediate future. Floods and landslides in 2015 demonstrated the vulnerability of the country to natural disasters. In addition, its population is highly vulnerability to multiple hazards: in the last 30 years alone, Myanmar suffered from 27 disaster events (seismic activity, epidemic, flood, landslides and storms) killing 162,643 people; affecting more than 4,596,724 and causing over 5,913,743,000 USD damages.

Almost the entire country is affected by natural hazards, with varying intensity depending on the hazards. Drought is the most tenacious hazard throughout the country, cyclones effect three distinct regions of the country, earthquakes and floods significantly affect similar areas when weighted by mortality, however, floods generally causes more economic damaged. Landslides also present a significant risk for regions on the western border. Furthermore Myanmar has been affected by ongoing national conflicts for the past 40 years, which have yielded population displacements and humanitarian crisis including the Bengali population.

Myanmar has made important progress in its disaster management policies, plans, and procedures since 2008, when Cyclone Nargis impacted the country leaving devastation in its aftermath. The Government of Myanmar (GoM) has modified the government structure and created new authorities and plans to improve the effectiveness of disaster management at all levels. While this progress is encouraging and shows the determination of the government to make necessary adjustments, the resources to implement the policy changes have been slower to develop.

As witnessed during the Myanmar flood in 2015, Nepal Earthquake in 2014,

Haiyan Typhoon in the Philippines in 2013, etc. responding to emergencies requires strong local and national emergency actors. They are often the first responders before international actors arrive and are at times the only responders as trends of more frequent and high-intensity disasters means international resources are stretched. Therefore, investing in strengthening local capacities has the benefit of ensuring emergency response and management is efficient, effective and sustainable, resulting in a reduction of loss of lives and assets.

There is a need to improve the humanitarian architecture in Myanmar in order to face future disaster events with well-coordinated efforts. It is critical that Myanmar government, local NGOs and civil society groups participate in the humanitarian assistance framework in order to make it more efficient and effective, as they are the first responders for any humanitarian emergency. Effective coordination and partnerships among the humanitarian actors needs to be established and operationalized in Myanmar like most of the countries around the world.

1.2 Objective of the Study

The objective of the study is to examine on knowledge, attitude and preparedness and assess the prevention/protection of disasters in Hinthada Township.

1.3 Method of Study

In this thesis, descriptive method is used with primary and secondary data. Primary data is collected from Key Informant Interview (KII) and secondary data is obtained from Department of Disaster Management, Department of Disaster Risk Management, Township Disaster Management Committee, Asian Disaster Preparedness Center (ADPC), United Nations Organizations and statistics, reports from UN-Habitat as well as related references from internet websites.

The structured interview questionnaires were prepared for community groups were distributed to 247 respondents selected randomly from Hinthada Township and nearby villages.

1.4 Scope and Limitations of the Study

This study mainly focuses on multi disaster management awareness and

preparedness plans and do not consider the sectors of disaster management cycle. The survey collected information only on general knowledge on multi disaster awareness, community attitude on what they do or will do in time of disaster and community practices on what they do before, during and after disasters. The survey was collected in Hinthada Township and nearby villages of Hinthada Township. The survey was conducted in July, 2019. This study provides some key and important insights but there are some limitations. These include some limited to a large amount of missing data from township, village tract and village levels and some unreliable and inconsistent data from all levels and some individuals unable to understand or unable to answer some of the questions.

1.5 Organization of the Study

This study organized into five chapters. The first chapter presents the introduction, including rationale of the study, objectives of the study, method of study, scope and limitations of the study and organization of the study. Chapter II includes the literature review of definitions of hazard and disaster, characteristics of hazard and disaster, concepts of disaster, phases of disaster management, component of disaster preparedness, community based disaster management approach, recovery on disasters and reviews in previous studies. Chapter III describes definition and concepts of disasters, overview of disaster, community based disaster risk reduction policy, institutional arrangements for disaster risk reduction, disaster management communications and educative measure for public awareness in Myanmar. Chapter IV consists of the survey profile of Ayeyarwaddy region and survey design of Hinthada Township, and analysis on survey data. Finally, Chapter V includes findings and suggestions in this study.

CHAPTER II

LITERATURE REVIEW

2.1 Definition of hazard and disaster

A natural hazard is a geophysical, atmospheric, or hydrological event that has potential for causing harm or loss. Usually, these events are both uncommon and extreme, in the perspective of the range of natural phenomena such as rainfall, tropical storms, flooding, and seismic tremor or earthquake. A natural hazard is a disaster that has not yet occurred. Natural events are often referred to as natural hazards when referring to the general phenomenon, but they are called natural disasters when referring to a specific event, such as the 2004 Indian Ocean earthquake and tsunami or Hurricane Katrina. If a natural event does not pose any risk to human property or lives, it is simply a natural event; hazards and disasters only occur in conjunction with human society.

A natural disaster is the occurrence of an abnormal or infrequent hazard that affects vulnerable communities or geographic areas, causing substantial damage, disruption, and perhaps casualties and leaving the affected communities unable to function normally. In other words, a natural disaster is a natural event, such as an earthquake, flood, or hurricane, which negatively affects society, either through damage to property or through loss of life.

Hazards and disasters can be classified as either natural or human-made (anthropogenic – resulting from human activity). Natural hazards and disasters are divided into six major groups: Biological, Climatologically, Extra-Terrestrial, Geophysical, Hydrological, and Meteorological. Human-made hazards and disasters are divided into five main categories: Engineering Incidents, HazMat Incidents, Interpersonal Incidents, Nuclear/Radioactive Incidents, and Terrorism Incidents.

In theory and in practice, multi-hazard is used regularly in three ways (i) the overlay of single hazards (i.e., hazards are discrete and independent); (ii) the identification of all hazards in a place and (iii) the identification of all hazards in a

place and the interactions that may occur between them (i.e. hazards have interrelations). Single hazard approaches, including the overlay of multiple single hazards that are treated independently, could potentially underestimate risk, distort management priorities or increase vulnerability to other spatially relevant hazards. Approaches that consider multiple hazards and their potential interactions, although currently challenging and an important research gap, are more representative of the natural and build environment.

2.2 Characteristic of hazard and disaster

Hazards are process or events that pose a threat to people, property and the environment. They can be natural or human induced. The important thing is that these processes or events only become hazards when there is the *potential* to cause significant harm to people (e.g. through injury, loss of life, damage to property, socio-economic disruption or environmental degradation).

Hazards can also be categorized in terms of their spatial extent, predictability, frequency, magnitude, duration, speed of onset, and effects.

Duration: The length of time that a hazard lasts for. As a general rule the longer the hazard the more severe it is likely to be. For example an earthquake that lasts 1 minute is likely to be more severe than one that last two seconds and a drought that lasts ten years is likely to be more severe than one that last three months.

Magnitude: This is the strength of a hazard. Most hazards are measured on a scale e.g. the Richter scale or the volcanic explosivity index (VEI). Generally speaking, the stronger the hazard the more severe the hazard is.

Predictability: Some hazards are easier to predict than others. For example, volcanoes normally give warning signs before they erupt and tropical storms can be tracked from development to landfall. However, others like earthquakes are much harder to predict. Generally speaking hazards that hit with no warning are going to be more serious.

Regularity: If hazards happen often and in quick succession e.g. a earthquake followed by multiple aftershocks then the severity is likely to be greater. During hurricane seasons, countries can be hit by repeated storms each causing greater damage because it has not been possible to recover from previous damage.

Frequency: The return interval of hazards of certain sizes. For example earthquakes

with a magnitude of over 8.0 happen on average once a year, but earthquakes of only 3 or 4 happen many times a day. If the hazard is a less frequent strong event, then it is going to have a bigger impact.

Speed of onset: If the peak of the hazard arrives first or arrives quickly e.g. an earthquake, then the affects are likely to be worse than one that arrives slowly e.g. a drought.

Spatial concentration: Where hazards are located or centered. For example earthquakes tended to be focused along plate boundaries, whereas tropical storms tend to be located in coastal areas in the tropics. Hazards that are located in known areas can be better prepared for and managed better.

Areal extent: If a hazard covers a large area e.g. a drought covering the whole of East Africa, then the severity of the hazard is likely to be more severe, than a flood hitting just one village.

Intentionality: Intentional or accidental.

Hazards can be further classified by their timing and predictability durations:

Table (2.1) Timing and Predictably Classifications of hazards

Timing	Predictability	Hazards
Quick Timing	Predictable	Tropical, Storms, Hurricanes, Floods, Wildfires, Storms, Extreme Heat, Pandemics
Quick Timing	Unpredictable/Sudden	Earthquakes, Volcanoes, Tsunamis, Landslides, Avalanches, Tornados
Slow Timing	Predictable	Droughts, Famines

Source: Disaster Readiness Portal, 2019

Sometimes, natural hazards can fit into more than one category. For example, an earthquake in the middle of the ocean can also cause a tsunami; this would be a geological and a hydrological disaster because the earthquake (a geological event) caused the tsunami (a hydrological event). Another example is when a volcanic eruption (a geological event) spews ash and dust into the atmosphere to cause lower temperatures (a meteorological event). Natural hazards also fit into three categories that describe the speed and extent of a hazard: catastrophic hazards, rapid onset

hazards, and slow onset hazards.

Catastrophic hazards are large-scale that effect large numbers of people or have worldwide effects. Pandemics, large volcanic eruptions, and worldwide droughts are all examples of catastrophic natural hazards.

Rapid onset hazards occur quickly and with little warning. Volcanic eruptions, earthquakes, flash floods, and landslides are examples of rapid onset hazards.

Slow onset hazards occur slowly and may take years to develop. Epidemics, insect infestations, and droughts are all slow onset hazards.

Disaster is a serious disruption of the functioning of a community causing widespread human, material or environmental losses which exceed the ability of the affected community to cope using its own resources. Hazard is an event or occurrence that has the potential for causing injuries to life and damaging property and the environment. A disaster takes place when a hazard actually causes significant harm to a community/region and the people in the affected community/region cannot deal with this harm adequately without outside help. The harm can be economic (costs of repairs), physical (damaged property), social (death, mental health and loss of support groups) and/or environmental.

The effects of natural disasters are many and varied. Some are short term effects that can be fixed with relative ease while others last for years. Natural disasters have three general types of effects: primary effects, secondary effects, and tertiary effects.

Primary effects are the direct result of the natural disaster, such as collapsed buildings and water damage.

Secondary effects are the result of primary effects. Examples of secondary effects include power outages due to fallen trees or damaged building and fires from broken gas lines. In these examples, the fallen trees and the damaged building would be primary effects that caused the power outages and fires (secondary effects).

Tertiary effects are the long term effects of natural disasters. These include changes in the landscape and natural features, loss of habitat, and crop failure or reduction due to cooler temperatures or other interference.

Table (2.2) Natural disaster classification

Geophysical	Hydrological	Meteorological	Climatological
Earthquake	Flood	Storm	Extreme
Volcano	General Flood	Tropical Cyclone	Temperature
Mass	Flash Flood	Extra-Tropical	Heat wave
movement(Dry)	Storm Surge/ Coastal Flood	Cyclone	Cold wave
Rockfall	Mass movement	Convective Storm	Extreme Winter
Landslide	(Wet)	Local Storm	conditions
Avalanche	Rockfall		Drought
Subsidence	Landslide		Wildfire
	Avalanche		Forest Fire
	Subsidence		Land Fire

Source: DisCatClass, 2009

2.3 Concepts of Disaster

The term disaster is described as, “ Any event (happening with or without warning) causing or threatening death, injury or disease damage to property, infrastructure or the environment which exceeds the coping capability of the affected society”(Khanna& Khanna, 2010). As per Section 2(d) of Disaster Management Act 2005, disaster means, “a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.”

WHO defines Disaster as "Any occurrence that causes damage, ecological disruption, loss of human life, deterioration of health and health services, on a scale sufficient to warrant an extraordinary response from outside the affected community or area"? The word derives from Middle French *désastre* and that from Italian, which in turn comes from the Greek .The root of the word disaster (“bad star” in Greek) comes from an astrological theme in which the ancients used to refer to the destruction or deconstruction of a star as ‘disaster’. Disasters have an enormous

impact on development. With every disaster, there is a significant impact on various sectors of development like agriculture, housing, health, education and infrastructure. This results in a serious social and economic setback to the development and particularly the poverty reduction priorities of the developing countries and poses a threat for achieving the Millennium Development Goals (MDGs). To meet with this crisis, the scarce resources that are programmed for development are often diverted for relief and rehabilitation efforts.

Moreover most natural disasters are fairly local in their impact; the worst can change the planet. The 1815 eruption of the Indonesian volcano Tamora pumped so much sulfur into the atmosphere that the world's temperature dropped by 2 degrees Fahrenheit (1 degree Celsius) for two years afterwards. The March 2011 earthquake in Japan even shifted the earth's axis, shortening the length of the day.

The economic impact on the world can be just as profound due to disasters. The 2005 Atlantic hurricane season saw a record 28 storms, including seven major hurricanes. Hurricane Katrina took the headlines as the most expensive tropical cyclone in history by both economic and insured losses, but the season as a whole caused aggregate economic losses of US\$209 billion, equal to the seventh most costly year on record for natural disasters.

2.4 Disaster Management Cycle

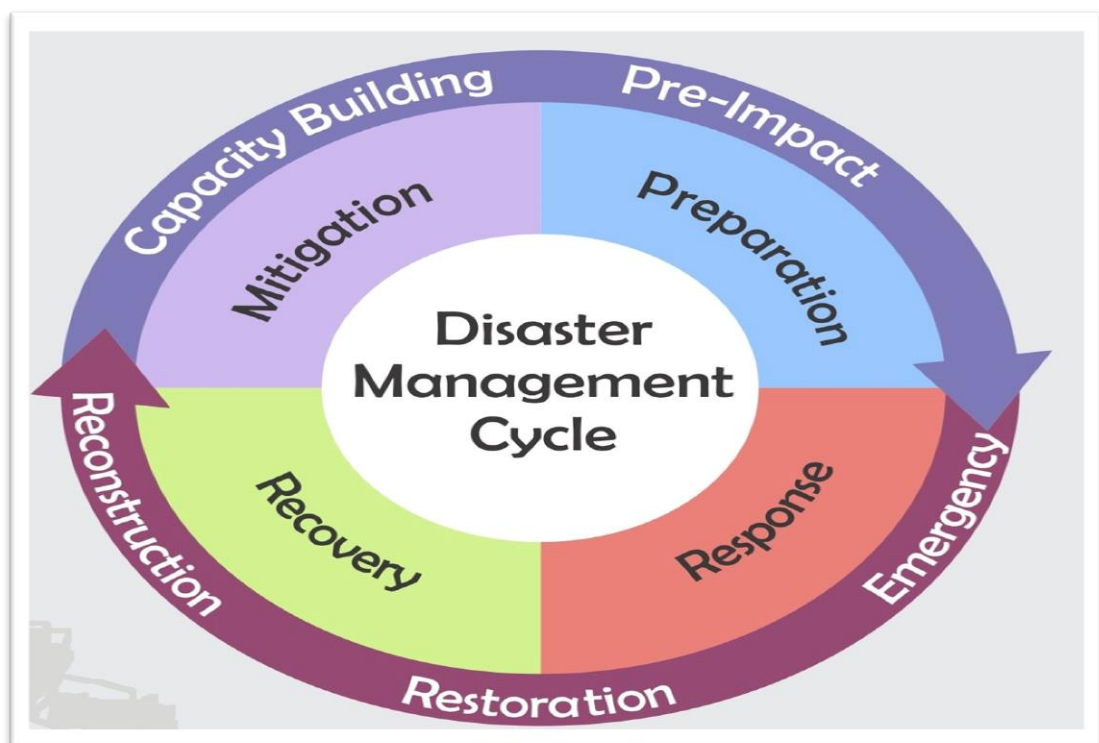
Disaster management aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The Disaster management cycle illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. Appropriate actions at all points in the cycle lead to greater preparedness, better warnings, reduced vulnerability or the prevention of disasters during the next iteration of the cycle. The complete disaster management cycle includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure.

The mitigation and preparedness phases occur as disaster management improvements are made in anticipation of a disaster event. Developmental considerations play a key role in contributing to the mitigation and preparation of a

community to effectively confront a disaster. As a disaster occurs, disaster management actors, in particular humanitarian organizations become involved in the immediate response and long-term recovery phases. The four disaster management phases illustrated here does not always, or even generally, occurs in isolation or in this precise order. Often phases of the cycle overlap and the length of each phase greatly depends on the severity of the disaster.

1. **Mitigation** - Minimizing the effects of disaster.
Examples: building codes and zoning; vulnerability analyses; public education.
2. **Preparedness** - Planning how to respond.
Examples: preparedness plans; emergency exercises/training; warning systems.
3. **Response** - Efforts to minimize the hazards created by a disaster.
Examples: search and rescue; emergency relief.
4. **Recovery** - Returning the community to normal.
Examples: temporary housing; grants; medical care.

Figure (2.1) Disaster Management Cycle



Source: The Disaster Management Cycle (BYJU'S, 2016)

The goals of disaster management are to reduce, or avoid, losses from hazards, to assure prompt assistance to victims, and to achieve rapid and effective recovery.

2.5 Component of Disaster Preparedness

There are nine major components involved in disaster preparedness, which have been deliberated below (Bose C, 2002):

Assessing Vulnerability - The disaster manager must know that a particular geographic region or community is susceptible to the impacts of sudden or slow onset hazards.

Planning - The objective of all the activities designed to promote disaster preparedness, is to have plans in place that are implementable and for which commitment and resources are relatively assured.

Institutional Framework - A coordinated disaster preparedness and response system is a prerequisite to any disaster preparedness plan. The framework should be designed as per the tradition of Governmental structure of the country i.e. horizontal coordination at the central Government level among ministries and other bodies while vertical coordination between central and local authorities.

Information System - The preparedness plan must have an information system appropriate to the disaster concerned. i.e. for slow onset disasters (for a region of famine) a formalized data collection process, early warning system, etc. For sudden onset disasters, prediction, warning, communication and evacuation, etc.

Resource Base - Preparedness should be made as per perceived disaster. Such a requirement should cover all aspects of relief and recovery phase. Elements such as shelters, medicines, food/Supplementary food, communication system, and logistic system and relief workers indicate major requirements of any disaster.

Warning Systems - During rapid onset disasters, a warning system can save many a life, by giving notice to the vulnerable population so that they can escape the place or take precautionary measures to prevent the hazard from becoming a disaster. However, in the preparedness plan provision of alternate communication system should be made so that it can be utilized in the case of power line and receiving stations are destroyed or become non-operational.

Response Mechanism - At a certain stage in the warning process, various

responses will have to be mobilized. The staging of responses becomes an essential factor in designing a preparedness plan.

Public Education and Training - The preparedness process will only be effective if those who are the ultimate beneficiaries know what to do at the time of disaster and hence education, related to disaster safety should be given.

Rehearsals - To check the efficiency of preparedness plan, a rehearsal (mock drill) should be arranged so that the gaps if any can be known.

2.6 Community Based Disaster Management Approach

The aim of CBDM is to reduce vulnerabilities and strengthen people's capacity to cope with hazards. A thorough assessment of a community's exposure to hazards and an analysis of their specific vulnerabilities and capacities is the basis for activities, projects and programs that can reduce disaster risks. Because a community is involved in the whole process, their felt and real needs as well as inherent resources are considered.

In the CBDM Process, a thorough assessment of the community's hazard exposure and analysis of their vulnerabilities as well as capacities is the basis for activities, projects and programs to reduce disaster risks. The community should be involved in the process of assessment, planning and implementation. The CBDRM process has seven sequential stages, which can be executed before the occurrence of a disaster, or after one has happened, to reduce future risks. Each stage grows out of the preceding stage and leads to further action. Together, the sequence can build up a planning and implementation system, which can become a powerful disaster risk management tool. The following are the seven steps in the disaster risk management process. Selecting the Community; this is the process of choosing the most vulnerable communities for possible assistance on risk reduction using a set of criteria Rapport Building and Understanding the Community. This is basically building the relationship and trust with the local people. As relationship is established, general position of the community in terms of social, economic, political and economic aspects is understood. Participatory Disaster Risk Assessment (PDRA): This is a diagnostic process to identify the risks that the community faces and how people overcome those risks. The process involves hazard assessment, vulnerability assessment and capacity assessment. Participatory Disaster Risk Management

Planning: This follows after the analysis of the results of participatory risk assessment. People themselves identify risk reduction measures That will reduce vulnerabilities and enhance capacities. These risk reduction measures are then translated into a community disaster risk management plan.

2.6.1 Importance of Community Based Disaster Management

The Community Based Disaster Management (CBDM) approach provides opportunities for the local community to evaluate their own situation based on their own experiences initially. Under this approach, the local community not Only becomes part of creating plans and decisions, but also becomes a major player in its Implementation. Although the community is given greater roles in the decision-making and Implementation processes, CBDM does not ignore the importance of scientific and objective risk Assessment and planning. The CBDM approach acknowledges that as many stakeholders as Needed should be involved in the process, with the end goal of achieving capacities and Transferring of resources to the community, which level who would assume the biggest Responsibility in over disaster reduction. Raju, Asger. (2013)

2.7 Recovery on Disasters

The loss of life in recent events alone is staggering. Some 250,000 were killed across several countries in the 2004 tsunami. An estimated 140,000 lives were lost in the 2010 earthquake in Haiti. In Myanmar, 120,000 perished when Cyclone Nargis hit in 2008. The Kashmir earthquake in Pakistan in 2005 and the Sichuan earthquake in China in 2008 each killed more than 85,000. The earthquake and tsunami that hit Japan in 2011 resulted in the death of 18,000 people. Extreme drought was one cause of 230,000 deaths in Somalia between 2010 and 2012. Every one of those lives was precious—individual, intricate, human. The glare of numbers sometimes blinds us to this. The scale of these catastrophes makes it impossibly difficult to cope and recover in their aftermath. Survivors and affected communities are left reeling from the loss of lives and livelihoods. Nations and Governments confront the giant task of restoring and rebuilding destroyed assets—both economic and social.(Deraniyagala, 2016)

The internationally recognizes that large-scale natural disasters often require a commitment to longer –term recovery that extends beyond the provision of food ,

shelter and medical assistance . In the first half of 2008, there has been good progress in the implementation of the disaster recovery program, particularly through major disaster operations in West and Southern Africa, Bangladesh, China and Myanmar. A number of successful global and regional training and capacity-building activities have been conducted and have substantially increased knowledge sharing and coordination on key aspects of recovery programming, including cash transfer programming and livelihoods within the Red Cross Red Crescent Movement. The development of recovery surge team capacity has been enhanced through operations. However some training development work has been delayed due to human resource constraints and operational priorities.

Disaster management is a complex series of activities that include risk assessment, prevention measures, and preparedness to cope with future disasters, emergency response to a disaster, recovery and reconstruction. Good development and community preparedness can reduce the impact of a disaster especially for the most vulnerable people, such as those living in hazard-prone areas with few financial resources to help them recover if they lose their means of livelihood.

When disaster strikes the first response is to save lives (humanitarian action). While each disaster creates unique circumstances and the response needs to meet the specific situation the followings general areas will usually form part of the response: search and rescue – finding those who may be trapped under debris; assessment of needs – working out what is required , in what quantities , and for whom; health-providing medical care and preventing the spread of disease through immunization , the provision of safe water and food , waste disposal and burial of the dead ; basic needs – procuring and distributing food , shelter and clothing; gender –understanding the roles of men and women in families and communities to identify needs and ensure the fair distribution of resources; livelihood and economy – assisting people earn a living to speed their recovery; emotional support- counseling and reuniting separated families ; logistics – transporting people and equipment; finance – obtaining, allocating and accounting for money; communication – providing affected people with information , informing the fundraising ; infrastructure – rebuilding roads , electricity and telephone networks , water pipelines , and waste disposal systems.

Few countries have all the resources necessary to meet the demands of a large- scale disaster. International assistance can provide expert knowledge and

resources, but survivors and people living in the area can also do to help if they are prepared. Any emergency response needs to be coordinated to ensure the survival of the maximum possible number of victims.

Some of the issues to be considered in the disaster response include: respecting local knowledge while using international best practice, meeting survival needs in a culturally appropriate manner (e.g. Types of food, clothing and shelter), limiting effects of aid on the local economy, training people, organizations and communities to manage development fairly, prioritizing the distribution of limited supplies, gaining funding for long-term redevelopment and disaster preparedness ,rather than simply responding to the current emergency situation.

In the chaos of a disaster, the pressure to make quick decisions and balance the specific interests of victims, governments, Non-Government Organizations (NGOs) and donors may mean that best practice standards are not always achieved.

Once the immediate danger is over, people may need assistance to rebuild their lives and their livelihoods. Communities may need to rebuild their social and physical infrastructure and revitalize the economy. It takes time and money to plan and ensure that long-term redevelopment and future disaster preparedness are appropriate for everyone. Damaged structures and services may not necessarily be restored in their previous locations or forms as the disruptions can be an opportunity to make improvements. Seasonal factors must be considered; for example, seeds need to be distributed during the planting season and the type of temporary shelter used will depend on the climate and season.

2.8 Review on previous studies

Ko Ko Aung (2010) found that the historical events of Myanmar and the characteristics of Myanmar's disaster. The study provides types and causes of natural disasters including rapid onset disaster and slow onset disaster, and historical disaster events in Myanmar. It also covers comprehensive information on activities of the cyclone Nargis recovery activities.

Aye Aye Khine (2011) found that the community knowledge, awareness and perception on natural disasters in terms of flood and also attitudes towards disasters and risks in Ayeyarwaddy Region. The study emphasized three key components, which are community based disaster preparedness activities, community based

prevention and mitigation activities and school based disaster risk reduction activities.

Thinn Hlaing Oo (2017) also studied on sustainability of disaster education in Yangon, Myanmar with a case study of high schools in Kungyangon, Botataung, and Pazundaung Townships. Her study finds out the school based disaster education program in the areas of human resources, planning and management, financial, collaboration, technical material and also students' knowledge and preparedness action on disaster risk reduction.

This study is different from above mentioned studies and this study assesses the community knowledge, attitude and protection on multi hazard disasters preparedness for general knowledge, what to do in the time of disaster and preparedness. The study targeted community people who are living in urban and rural areas of Hinthada Township.

CHAPTER III

OVERVIEW OF HAZARD DISASTERS IN MYANMAR

3.1 Definition and concept of disasters in Myanmar

Myanmar is one of the largest countries in South East Asia with 56 million people. Myanmar shares borders with China, Laos, Thailand, Bangladesh, and India. In the south, Myanmar has marine borders with the Andaman Sea and the Bay of Bengal. Myanmar is ethnically diverse with a majority of the population made up of Barmars. Eight major national ethnic races are present in Myanmar. Each ethnic race is comprised of diverse ethnic groupings (Kachin, Kayah, Kayin, Chin, Mon, Bamar, Rakhine, and Shan). The largest city in Myanmar is Yangon and the capital of Myanmar is Naypyidaw. The predominately spoken language in Myanmar is Burmese and 89 percent of the population is Buddhist.

Myanmar is exposed to multiple natural hazards which include Cyclone, Storm surge, Floods, Landslide, Earthquake, Tsunami, Drought, Fire and Forest Fire. Its coastal regions are exposed to cyclones, storm surges and tsunamis while major parts of the country are at risk from earthquakes and fires. The rainfall-induced flooding is a recurring phenomenon across the country while some parts of the country is exposed to landslide and drought risks. As per the data from 2000-2001 to 2009-20102, fires constituted about 73% of reported disaster events, followed by floods (11%), storms (12%) and others (4%) including earthquakes, tsunami and landslides. The Cyclone Nargis (2008) was the worst natural disaster in the living memory of Myanmar. While the Republic of the Union of Myanmar is striving for a peaceful, modern and developed nation, natural disasters destroy the developmental gains and hinder the developmental interventions. The preparedness and mitigation should be an integral part of the development plans and programmes. It is also important to make prior arrangement for relief, rehabilitation and reconstruction

activities, in case a natural disaster strikes.

The summary of nine natural hazards of Myanmar is as follows:

Cyclone

Myanmar is prone to cyclones and April, May and October to December are considered to be cyclone months as per last 100 years record. In the last four decades, seven major cyclones hit Myanmar; 1968 (Sittwe cyclone), 1975 (Patheingyi cyclone), 1982 (Gwa cyclone), 1994 (Maundaw cyclone), 2006 (Mala cyclone), 2007 (Akanha cyclone), 2008 (Nargis cyclone) and 2010 (Cyclone Giri). The Sittwe cyclone led to a loss of 1037 lives, Patheingyi cyclone claimed 304 lives and Nargis, the most devastating in the living memory of Myanmar, resulted in 84,537 deaths, 53,836 persons missing, affected 2.4 million population, and damage and loss of approximately 11.7 trillion Kyats (4.1 billion USD). The Cyclone Giri in 2010 also claimed 58 lives.

Storm surge

The coastal regions of Ayeyarwady Region and Rakhine State are prone to storm surge. During Cyclone Nargis, 90 percent of deaths were caused as a direct consequence of the storm surge.

Floods

Floods in the past, led to loss of lives and properties, damage to critical infrastructure, economic loss and health related problems such as outbreak of water borne diseases when lakes, ponds and reservoirs get contaminated. Myanmar receives practically all its rainfall between mid-May and October, during which flooding is common. The riverine floods are common in the river delta while the flash floods and landslides are frequent in upper reaches of the river systems, which are normally the mountainous areas. In the cities and towns, localized floods occur from time to time.

Landslide

The landslides of various scale occur in mountainous regions especially in the Western, Southern and Eastern Highland of Myanmar. The Western ranges have experienced all types of landslide and earth movement such as rock falls, rock slides, and soil avalanche and mud flow. Due to sparse population, the direct impact of landslide in this region damaged infrastructure rather than human settlement.

Earthquake

Myanmar can be divided in 3 seismically active regions namely the

Northwestern Region, the Central Lowland and the Shan Plateau-Yunnan Region. During the 20th Century, at least 18 large earthquakes had happened along the Central Lowland where the well-known Sagaing Fault (1000km) passing through. Another large seismogenic fault called Kyaukkyan Fault about 500 km long is in the western part of the Shan Plateau. The largest measured earthquake in Myanmar is 8.0 Richter Scale, which occurred on the northern segment of this fault on 23 May 1912. Myanmar was hit by an earthquake of 6.8 Richter Scale on 24th March 2011 in Shan State.

Tsunami

The 2,400 kilometers coastline of Myanmar can be divided in three regions namely Rakhine coastal area in northwest, Ayeyarwady Delta in middle, and Taninthayi coastal area in the south. The intensity of the tsunami in terms of round-up and the extent of the inundation was comparatively lower than other countries during 2004 Indian Ocean Tsunami as indicated by the computed tsunami amplitudes. The amplitudes are slightly larger off the Ayeyarwady delta, because the shallow delta extending offshore caused increment of tsunami wave amplitude.

Dry zone/Drought

The Dry zone of Myanmar is located in central part of the country in Magway, Mandalay and Sagaing Regions (lower part) across 54 Townships in 13 Districts and covers approximately 10 percent of total area of the country. It falls under arid to semi-arid zone and the average annual precipitation is below 40 inches.

Fire

The Fire hazard is the most frequent hazard in Myanmar. The high incidences of fire cases are concentrated mainly in Yangon, Mandalay, Ayeyarwady, Sagaing and Bago, which accounts for 63 percent of the total fire cases. January to May is the high season for fires and average annual fire cases are 900, which leads to loss of lives and properties.

Forest Fire

The forest fires in Myanmar are normally surface fire, most frequent during the dry season, starting around December until May. It occurs in almost all States and Regions though sporadic, however more common in upland regions namely Bago, Chin, Kayah, Kachin, Mandalay, Rakhine and Shan. It causes haze problem which leads to negative impact on the community.

Table 3.1 Hazard Profile of Myanmar

Hazard	Profile
Earthquake and Tsunami	Two main sources: Sagaing fault, and the Sundasubduction thrust zone. Four areas are designated as the Destructive Zone: 1), Bago-Phyu, 2) Mandalay – Sagaing– Tagaung,3) Putao -Tanaing, and Kale-Homalin. Although the latter two has major Earthquake hazards, their risk – level is low because they are sparsely populated. In coastal areas of Myanmar: Rakhine Coast falls in the Strong Zone with MMI 8, the Ayeyarwady Delta and Taninthayi coasts fall in the Moderate Zone with MMI 7.
Fire/Forest fire	Most frequent hazards occurring in Myanmar. In the last ten years (2007-2016), 12,000 cases were recorded and Yangon, Mandalay, Ayeyarwaddy, Sagaing and Bago are the most affected States and Regions.
Drought	Approximately 51 townships spread across Magway, Mandalay and Sagaing (lower) regions are prone to drought.
Landslide	The mountains regions, especially in the western ranges and some localities in the eastern highland are prone to landslides. The western ranges have experienced different types of landslides and earth movements such as rock falls, rockslides, soil avalanches and mud flows.

Table (3.1) Continued

Floods	Flood is one of the most frequent hazards in Myanmar. The threat of flooding usually occurs three times per year, in June, July –August late, September and October with the biggest threat in August, as monsoon rains peak around that time. Most of the areas of Myanmar are prone to floods and the central part of Ayeyarwaddy Region is the most affected one.
Industrial/ Technological Hazards	Myanmar has 51 industrial parks (limited information), primarily located in Yangon and Mandalay regions. Most of the companies are small to medium enterprises, and lack disaster risk management and business continuity plans. There is a need for profiling of industrial / technological hazards.

Source, MAPDRR 2017

In responding to these growing threats, it is first important to know where the dangers lie. The Identification of Global Risk Hotspots project, published by the World Bank and Columbia University in 2005, used data on historical occurrence—actual disaster events—and zoning of areas of high risk to a natural hazard, to determine areas of relatively high risk to lives and livelihoods. It identified 96 countries globally with high mortality risk from two or more hazards, and the top 75 countries at relatively high economic risk from multiple hazards based on GDP. In Asia, the countries at highest risk of human losses and economic damage are Bangladesh, the Philippines, and Viet Nam.

Using this data, the Independent Evaluation study ranked ADB’s developing member countries according to mortality risks. Of 44 countries, 20 are rated as “mortality hotspots”, as shown in Table 3.1 where Myanmar is ranked at 14 for relatively high mortality risk from multiple hazards.

Almost the entire populations of Bangladesh and Nepal live in areas of high mortality risk, as do four of five residents of the Philippines, three-quarters of the population of Viet Nam, more than half of Bhutan and Indonesia, and almost half of Pakistan.

In terms of economic risk, more than half of the populations in seven

countries are at high risk (or 494 million people), and, in eight countries, more than 50% of GDP is produced in areas at risk.

3.2 Overview of Disaster

Myanmar is regarded as agriculture based country as it accounts for 40.2 percent of the Gross Domestic Product (GDP). It has a tropical climate with three seasons namely rainy (mid-May to mid-October), winter (mid-October to mid-February) and summer (mid-February to mid-May). There is large variation in average precipitation as coastal areas receive average precipitation in the range of 4000 mm to 5600 mm while central dry zone receives precipitation in the range of 600 mm and 1400 mm.

Myanmar has a long coastline of about 2,400 km long which cover almost all East Coast Bay of Bengal. Most of the coastal areas of Myanmar are within the risk zone. The rankings for individual hazards greatly vary throughout the country. In Myanmar, drought is the most persistent hazard especially in the middle part of Myanmar. Cyclones impact mostly the coastal regions of the country. However the historical record reveals that the deadliest Intense Tsunamis are rare in Myanmar and her neighboring Bay of Bengal Area.

Natural Disasters in Myanmar consist of natural disasters such as storms, floods, earthquake, tsunami and landslides and urban fire. Among them, earthquakes, tsunami and landslides occur rarely in Myanmar; floods occur mostly around Ayeyarwaddy, Chindwin, Thanlwin and Sittaung rivers. The potential tsunami threatened areas in Myanmar includes Ayeyarwaddy Delta Region, coastal areas of Rakhine, Yangon Division, Mon State and Thaninthayi Division. These areas are also the major sufferers of tropical storms. For the case of man-made disasters like urban fires, it is likely to happen in all areas of the country. However dry zones like Mandalay, Magway and Sagaing Regions and densely populated areas of Yangon and Ayeyarwaddy Region are the most important regions for the occurrence of urban fires.

3.3 Community Based Disaster Risk Reduction Policy

The Ministry of Social Welfare, Relief and Resettlement will be lead drafting of the development of Community Based Disaster Risk Reduction (CBDRR) Policy.

The objective of this policy is to create an enabling framework for community based disaster preparedness and risk reduction and guide future CBDRR projects. An inter-ministerial Task Force including CBDRR experts shall be constituted to draft CBDRR policy. It will study the similar policies of other ASEAN countries, with support from regional and international organizations like ASEAN, ADPC and UN Agencies, which pioneering the application of CBDRR concept in the region. The CBDRR Policy will reflect and capture the concerns, needs and requirements of all stakeholders. The Policy will be presented to the NDPCC for its approval and enforcement.

3.3.1 Community Based Disaster Risk Reduction Program Background

Myanmar Red Cross Society (MRCS) has implemented Disaster Risk Reduction (DRR) programme with the full financial and technical support of the French Red Cross (FRC) since 2009. The objective of the programme is to increase the capacities and resilience of communities at risk, located in the most disaster prone coastal areas in Myanmar, through the empowerment and sustainability of the DRR community efforts and a strong capacity building component within MRCS township branches. And then the empowerment of the community itself towards the development of DRR practices will be one of the most important evaluation criteria. The program was first implemented at KyaungKone Township in 2009. Now some activities are still being carried out in this township. The program has achieved high efficiency and speed after more than 1 year and six months. So the program can be operated in two townships simultaneously and it has been implemented in Yei Kyi and KyonPyaw Township in 2010 and 2011 respectively.

3.3.2 National Community Based Disaster Risk Reduction Program

The goal of the National CBDRR Program is to provide a unified interface for CBDRR programs nation-wide. This is planned to achieve through clear definitions of roles and responsibilities of each government ministry in support of CBDRR implementation in the country. The program will emphasize on the importance of networking and information sharing among various agencies(both government and non-government) and will offer practical tools for such-component and it will align with align with the Development of Community Based Disaster Risk Reduction

(CBDRR) policy sub-component with strong support from experienced partners such as Myanmar Red Cross Society(MRCS), UN agencies, NGOs (CARE, World Vision, Save the Children, Metta Foundation, Mingalar Myanmar, etc).

3.3.3 Promoting Community Based Disaster Risk Reduction Volunteerism

The success of any CBDRR initiatives rests on the sense of ownership imbrued within the community where the activities take place. This sub component hopes to accomplish this spirit through the involvement of community from the start in designing and implementing risk reduction interventions in their locality to help nurture community volunteerism. Village volunteer groups will be formed under supervision of local DP Committee.

3.3.4 Establishing Community Based Disaster Risk Reduction Resource Centers

The Planning Department under the Ministry of National Planning & Economic Development shall take the lead for formation of Resource Centers and MRCS has always been at the fore front of promoting CBDRR practices in the country. MRCS is also in the unique position to be coordinating extensive networks of volunteers and branch offices throughout the country with skilled human resources. In collaboration with Social Welfare, Department of Health, Fire services, RRD, MRCS and local Disaster Preparedness Committees. The Planning Department will conceptualize and establish CBDRR Resource Centers. The roles of Resource Centers may slightly differ from place to place but the basic activities to be covered include provision of guidance on CBDRR activities, raising awareness of the community through production and distribution of IEC (information, education and communication) materials and preparation and maintenance of database on physical, material and human resources.

3.4 Institutional Arrangements for Disaster Risk Reduction

The Government of Myanmar has established institutional arrangements for dealing with disasters and has systems and practices for disaster prevention and preparedness based on the country's administrative structure and socio-cultural norms. At the national level, the national Natural Disaster Preparedness Central Committee (NDPCC) chaired by the Prime Minister is the apex body on disaster

issues. At the lower administrative levels, the Chairmen of the State/ Division/ Township Peace and Development Councils head the disaster Prevention and Preparedness Committees. Emergency response functions are primarily assigned to the Fire Services department under the Ministry of Social Welfare. In addition, the Department for Meteorology and Hydrology (DMH) is responsible for disaster forecasting and early warning dissemination.

3.4.1 Disaster Risk Reduction

Ministry of Social Welfare, Relief and Resettlement Department (RRD), in association with local organizations has supported various disaster risk management activities including capacity building of officials. At the sub national levels, the Disaster Prevention and Preparedness Committees lead a range of preventive measures and post-disaster relief activities, including evacuation, emergency transportation and communication, shelter provision, and healthcare. Localized disaster preparedness and prevention measures mainly include disaster awareness raising and salt-water protection infrastructure in the delta region.

3.4.2 Disaster Risk Reduction in Delta Zone

Cyclone Nargis also highlighted the need of the country to undertake a range of priority actions for reducing disaster risks. Some of the key lessons learnt from the post-Nargis emergency response include the need to straighten community preparedness including evaluation protocols, the need to develop a thorough understanding of the early warning by the end user (community) and the need to consider the development of strategically located evacuation shelters. Based on the experience from the Post-Nargis response and with wide consultation with a variety of stakeholders from government institutions, donor community, international NGOs, local NGOs, and UN agencies, five areas of actions (or intended outcomes) emerged which form basis of the strategy for the PONREPP Disaster Risk Reduction Sector Plan 2009- 2011.

3.4.3 Establishment of Disaster Management Training Centre (DMTC)

The government approved establishment of the Disaster Management Training Centre (DMTC) in order to build up the capacity of people implementing disaster management activities. The DMTC will build upon the existing pool of

experts within the Relief and Resettlement Department and the existing Disaster Management Course, which has supported capacity development of officials from Government Departments and Social Organizations, since 1977.

DMTC will be located in Hinthada Township in Ayeyarwaddy Region. The Ministry of Social Welfare, Relief and Resettlement is now undertaking the three-year plan (2013-2015) for establishment of DMTC. Under Phase 1 (2013-2014), construction of the three main buildings is now underway. The Ministry is collaborating with international and local partners to mobilize the technical and financial resources for:

- i. Human resource and institutional capacity development
- ii. Infrastructure development
- iii. Development of Curriculum and procurement of Teaching Aids
- iv. Networking and partnership with International and Regional Training Institutes and Centers

3.4.4 Strengthening Village Disaster Management Committees

Once the DRR Action Plan is implemented, it will be time to strengthen the DM committee which will be in charge of the coordination and follow-up of activity implementation within the community. The strengthening and mobilization phase of the committee will take place during the DRR Action Plan drafting. The strengthening process of the Village Disaster Management Committee (VDMC) will take into account same criteria as gender equity, professional background or skills, willingness and involvement, commitment, community key leaders or representatives, etc. The DM committee members need to have a strong capacity to mobilize and coordinate community initiatives.

3.4.5 Climate Change and Disaster Risk Reduction

Areas of intensive climate risk as in the Delta region, with high vulnerability to severe tropical storms and consequent storms surges, indicate the need for the country to reduce disaster risk and to manage environmental change due to emerging impact on livelihoods options and poverty needs. A multihazard approach will be adopted, including the potential impacts of climate change and the need to help affected communities to achieve sustainable livelihood. This would include the

incremental impacts of climate change such as increased salination, sea-level rise, and increased incidence of drought, and the higher frequency and severity of major catastrophic events such as floods and cyclones. These factors are likely to impact on both livelihoods and on resilience to future disasters in the longer term: however, a start will be made in the short to medium term under the PONREPP DRR Sector Plan.

3.4.6 Natural Environment and Disaster Risk Reduction

The post- Nargis context in the delta presents opportunity to restore the forests including mangroves with their livelihoods and environmental services over a large area. Community-based mangrove restoration and creation of community forests can help landless gain access to land, and are critical to reduce disaster risk by restoring natural wave breaker environmental of floods mitigation to these degraded lands. Communities could “build natural resources back better” to create a more productive, safe and sustainable environment than they had before.

Although much of the mangrove forest cover in the delta had been destroyed or degraded prior to Nargis, in some areas where these forests have been managed on a sustainable basis, the mangroves played a key role in reducing both the death toll and the impacts on livelihoods.

3.4.7 Foreign Assistance and International Partners

The Government of Myanmar has established the Foreign Aid Management Central Committee (FAMCC) and the Foreign Aid Management Working Committee (FAMWC) to provide overall strategic guidance in ensuring the deployment of aid resources is consistent with national priorities and strategies. The Ministry of National Planning and Economic Development (MNPED) works closely with the two committees. The National Economic and Social Advisory Council (NESAC) provide advisory support to the FAMWC.

3.4.8 Constraints and Opportunities

While the aftermath of Cyclone Nargis presents a number of opportunities, there are constraints to both planning and implementation. These are indicative of some of the issues that will be addressed in the DRR sector plan during the course of

implementation.

3.5 Disaster Management Communications

Communication during and instantly after a disaster is a significant component of response and recovery since it connects affected people, families, and communities with first responders, support systems, and other family members. Reliable and accessible communication as well as information systems play vital role for a community's resilience. The role of communication technology has been recognized as integral to disaster management for a long time.

3.5.1 Early Warning Systems

The Myanmar government has been working to improve its early warning capacity through the country's Department of Meteorology and Hydrology (DMH), whose primary responsibility is to provide early warning to the higher authorities, local government, and disaster risk reduction agencies, media, international NGOs, Myanmar NGOs, and the general public. Earlier this year, Myanmar received US\$40 million from Japan to establish three weather radar stations in Yangon, Mandalay, and Kyaukpyu (a major town in Rakhine State, in western Myanmar) as well as 30 automatic weather observation stations across the country by 2017. When Cyclone Nargis struck there was only one radar station in the country which had not been operational since 1997. Although Myanmar had an early warning system in place at the time of Cyclone Nargis, it did not work properly and was slow in disseminating information that the military government might deem sensitive or result in panic.

The early warning system now links the DMH with each region, state, township, and district level via phone or fax (In 2012, only 3 percent of the population had a mobile phone), while from the township to village tract level, storm warnings are passed on either by phone or an officer dispatched to the area, with the village authorities making announcements on public loudspeakers. At the same time, weather warnings are now being more actively broadcast through radio or TV.¹²⁸ MSWRR also developed DAN (Disaster Alert Notification) application for both android and iOS versions.

Department of Meteorology and Hydrology (DMH) generates weather forecast and early warnings for cyclone, storm surge, and flood. Color-coded cyclone warning message was started to use in 2009, as an attempt to make early warning

message to be user friendly. Once the early warning on disaster is issued by DMH, it is informed to the public through media and TV. In order to improve the quality and accuracy of the weather forecast and early warning, DMH still needs to upgrade the capacity of equipment and tools for weather forecast. The DMH organizes Monsoon Forum as a mechanism for fostering a closer dialogue between forecast producers and users to enhance the uptake of weather and climate forecasts for disaster mitigation. The broader goal of the forum is to build the national capacity to mitigate disaster risks by linking national hydro-meteorological agencies to sectors that are vulnerable to climate risks, notably agriculture, water resources, health, and disaster management. RRD is also implementing the end-to-end early warning system project in collaboration with DMH, General Administrative Department and JICA to enhance the capacity of the government and the community. The pilot projects for Ayeyarwady and Rakhine have been implemented. UN and NGOs are assisting in the production of IEC materials related to early warning as well as on public awareness. The use mobile phone SMS for early warning is also being explored.

3.5.2 Responsible Agencies for Flood and Storm Warning

The primary responsibility of DMH is to provide early warning to the higher authorities, local government, and disaster risk reduction relevant agencies, media, INGOs, Myanmar NGOs and general public. DMH officials actively cooperate with local INGOs representative to implement community awareness, public education program and officials interviewed with State run TV about disaster risk reduction and role of early warning, adverse weather phenomenon and necessary actions to reduce socio economic losses. Additionally, a National Monsoon Forum jointly organized twice annually with the collaboration with regional partner agencies and stakeholders for climate outlook and disaster risk reduction is in place.

Meteorological articles about current weather events, significant weather, update information of La Niña and cyclone emergency color coding scheme are published in State Newspapers, Ministry of Transport Journal, and other private Journals. DMH established a link in 2011 with Myanmar RADIO for live radio broadcasting about early warning and advisories.¹³⁰ DMH is the responsible agency for flood forecasting and warning in the country. DMH maintains 27 Hydrological Stations and 44 Hydro meteorological stations and issues flood forecasts for 30

stations in Myanmar.

Hydrological Division of DMH is responsible for issuing daily river forecast and flood forecast along 8 major rivers (Ayeyarwady, Chindwin, Sittaung, Thanlwin, Dokehtawady, Bago, Shwegyin, and Ngawun). Whenever warnings are issued from River Forecasting Section (RFS) of DMH, the message is sent to the respective stations by telephone or Single Side Band (SSB) transceiver. When the station receives the message of warning, they immediately inform the local authorities and related departments to carry out the necessary action. At the same time the warnings are disseminated through the radio, television and the Newspaper for the general public.

3.6 Educative Measure for Public Awareness

The Relief and Resettlement Department (RRD) has been conducting State and Division Level short-term Disaster Management Courses for the public education and awareness on natural disaster reduction with the co-operation of other department concerned such as Meteorology and Hydrology Department , Health Department, Irrigation Department , Myanmar Red Cross Society , Myanmar Police Force and Fire Services Department . The courses are, originated mostly from ADPC and INGOs, and then workshops and discussion with government and NGOs for further training for local communities and grass root level educative measures public awareness. The training for trainers is conducted by local government authority and NGOs to organize and conduct sub-trainings in their regions for further training process.

The training subjects by RRD in these courses are as below;

- (i) The aims of Disaster Management Course and definitions
- (ii) History of Disaster in Myanmar
- (iii) Disaster Management
- (iv) Counter Disaster Plan
- (v) Function of Relief and Resettlement Department

3.6.1 Public Awareness, Education and Training

In the MAPDRR, Public Awareness, Education and Training stood third priority by HFA framework. Among these Public Awareness, Education and Training plan to conduct 11 projects to educate and train for the communities. A remembrance nightmare of Cyclone Nargis, Disaster Safety Day is set on 5th May of every year.

Currently ADPC and Department of Social Welfare, Relief and Resettlement led governments' departments, such as Department of Metrology and Hydrology , Fire Department , Basic Education Department , Higher Education Department , Department of Housing Development and Settlement , Yangon City Development Committee, Department of Development Affairs, Agriculture Planning Department, General Administrative Department , Attorneys General Office , Department of National Planning and Economic Development , etc. Setting future plans for disaster awareness education training to be completed in July 2010. After this discussion Public Awareness, Education and Training section would be held at schools, universities, communities ' level , townships level , management level , and special awareness programs , establishing disaster management training schools , research and development programs and followed by regional networking and knowledge sharing on DRR.

Table 3.2 Public Awareness, Education and Training

Public Awareness , Education and Training	
7.1	Awareness through Disaster Safety Day
7.2	National Public Awareness Program
7.3	Awareness through School and School Curriculum
7.4	Awareness through University Curriculum
7.5	Expansion Plan for Disaster Management Training
7.6	Training for Emergency Preparedness and Response at Township Level
7.7	Enhancing Training Capacities
7.8	Special Awareness Program
7.9	Establishment of Disaster Management Training School
7.10	Research and Development in Disaster Risk Reduction
7.11	Regional Networking and Knowledge Sharing on Disaster Risk Reduction

Source: Myanmar Action Plan on Disaster Risk Reduction (MAPDRR), 2009

In summary, DRR response in Myanmar is gradually improved and on the right track by government and internationals' collaboration and cooperation. Prime Minister led National Disaster Preparedness Central Committee has established various levels of DRR Management Committees and implementation of duties and responsibilities.

Public awareness on Disaster Risk Management is important as simple Do's and Don'ts of disasters can save many lives during disaster. It is important that the content of awareness messages should be consistent, clear and context specific and it should be conducted at regular intervals so that the knowledge is kept alive in the community to pass on from generation to generation and ensure that the disaster risk reduction become an integral have been started by Government , UN Agencies and NGOs such as Ministry of Education in collaboration with United Nations Children's Fund(UNICEF) has been working on integration of disaster risk reduction into school curriculums. United Nations Education, Scientific and Cultural Organization (UNESCO) with Ministry of Education has developed and distributed Resource Pack in approximately 2000 schools in severely affected eight townships in Delta and one township in Mandalay Division. UNDP Myanmar has developed posters on Do's and Don'ts of different disasters.

However, there is need to upscale these pilot projects and also to widen the scope to cover whole Myanmar. Also, these activities need to be conducted at regularly and a few additional activities have to be implemented to enhance the effectiveness. The sub-components below aim to deepen and inspire greater interest in disaster risk reduction, to encourage the design and implementation of creative and innovative interventions and to anchor the principles that strengthen the DRR commitment.

CHAPTER IV

SURVEY ANALYSIS

4.1 Survey Profile

Ayeyarwady Region, also known as the Delta region, is a coastal region between the Bay of Bengal to the west, and the Andaman Sea to the east. The capital city is Patheingyi. Sharing a border with Rakhine, Bago, and Yangon, Ayeyarwady Region consists of 26 townships, covering a total of 35,964 km². Ayeyarwady is Myanmar's most populated state with an estimated population of 6.32 million (2011 HMIS data) and population density of 176 people per square kilometre. Ayeyarwady is the region with the greatest percentage of people living in rural areas (88%) relative to urban areas (12%) living in urban areas. Ayeyarwady Region is composed of 6 districts: Patheingyi, Hinthada, Maubin, Myaung Mya, Phya Oo Aung and Lat Pau districts. This region has 39 cities, 273 quarters, 1919 village groups and 11907 villages. Being coastal region, it is notably vulnerable to climate risks. This area was severely affected by Cyclone Nargis in 2008.

Hinthada is situated along the Irrawaddy River opposite Tharraway, with which it is linked by ferry, at a point considered to be the head of the Irrawaddy's delta. It is a port for the rice and tobacco grown in the surrounding agricultural area and is connected by road and rail with Patheingyi and Yangon. It is also the site of an electric power station and an airfield. The area east of the town is a low-lying region protected by embankments along the Irrawaddy and is the site of a major irrigation scheme.

Hinthada Township has 1 town, 21 wards, 103 village tracts, and 820 villages. The overall population is approximately 338,435 as per 2014 census from Ministry of Labour, Immigration and Population (Male 159,694 and Female 178,741). Hinthada is also the site of an electric power station and an airfield however there is little to no electricity in rural areas. There is 100 percent radio coverage but only around 65% have radios. Few people who have a landline and less than 3 percent own a cellphone.

Main means of transport for all village tracts is by boat in rainy season and by motorcycle in dry season. No details were available on the poverty rate for any village tract but income was set at 'middle'. Most people engage in farming; fishing; casual labour, trading or as government staff. Although Hinthada was not affected by Nargis, yearly flooding occurs in some village tracts and villages and some villages have experienced landslides. According to the township profile, a Township DRR committee does exist and is supported by Myanmar Red Cross Society covering all VTs. Although the number of evacuation facilities across the township was not known, schools and monasteries were cited. No information was known or given about existing materials across village tracts. According to MIMU, some organizations are working in Hinthada, namely UNICEF in education; Norwegian People's Aid in governance; Myanmar Red Cross Society/ IFRC, PSI, UNICEF, and UNFPA in health; Terre des Homme Italia in protection; and UNICEF in WASH.

Hinthada Township has been one of the severely flood-affected municipalities in the Ayeyarwady Region historically. As the Township had considerable wasteland from the annual flooding, earthen dykes were constructed during the British colonial period since 1867. The dykes have been contributing to the protection of the urban area in Hinthada and transforming wetland into agricultural land over the generations. The yield of the paddy rice was dramatically increased as the colonial government planned for the expansion of exports that resulted from the opening of the Suez Canal in 1869.

An official report on the settlement operations in 1883–84 published by the British colonial government noted, "These embankments protect 75,377.63 acres of land now cultivated". Not only were yields impacted but also the dyke construction divided one village and half of them have been remained in flood prone-area since then. It is true that the dyke construction benefits the vast amount of cultivated land for the protected area, although it entails asymmetrical consequences: one is greater yields, and the other is annual floods for a long period on the unprotected side.

Hinthada Township, the most populous township in the district increased from 163875 in 1931, to 184713 in 1941 to 431521 in 2001 and 473505 in 2006. As Hinthada is the capital of the district with 29% of the district's total population. Hence Hinthada Township has a high population density. According to 2014 Myanmar Population and Housing Census, in Hinthada Township, there are 86,129 numbers of

conventional households where 19,829 households live in urban and while 66,300 households live in rural with more females than males with 89 males per 100 females. The majority of the people in the township live in rural areas with only (24.7%) living in urban areas. The population density of Hinthada Township is 345 persons per square kilometre. There are 3.8 persons living in each household in Hinthada Township. This is slightly lower than the Union average.

The proportion of productive working population between 15 to 64 years of age in Hinthada Township is 66.0 per cent. The proportions of children aged 14 and below together with the proportion of the elderly aged 65 and over are less than the proportion of the working age group population. Fewer proportions of children and elderly reduce the dependency of those age groups on the working age population.

4.2 Survey Design

To meet the objectives for this study, survey questionnaires were organized with assessment questions and included four parts. The first part is to study about the demographic characteristics of the residents of Hinthada Township, which consists of questions regarding the profiles of the samples and relevant with disaster. The second part contains questions to assess the knowledge of the community in the study area on multi hazard disaster awareness. The last part is to assess community practices on how to do before, during and after disaster, and then follow by community suggestions. In the development of questionnaire, it took references from internet and also consulted with experts of disaster management and risk reduction. The questionnaire used in this study is presented in Appendix. The survey employed quantitative technique collecting questionnaires information. The survey findings were obtained from quantities questionnaires survey from individual interviews and open-ended discussion with enterprises owners and managers.

The data were collected in Hinthada Township and wards and villages were selected with purposive sampling method and criteria include high population density. The target population was people living in urban and rural community in Hinthada Township. The survey respondents were chosen from those who are at least 18 years old and can answer well about survey questions. Simple random sampling method was used in the selection of respondents.

Table (4.1) shows the number of respondent and percentage on the survey area. Hence in the survey, the interview comprised largely more city residents than rural residents.

Table (4.1) Number of respondents in each ward and village

No.	Ward or Village	Number of Respondents	Percentage (%)
1	Ward	207	84
2	Village	40	16
Total		247	100

Source: Survey Data, 2019

4.3 Survey Findings

Social and demographic factors such as age, education and gender compositions influence on disaster awareness and preparedness. Social and demographic factor includes age, education and occupations.

4.3.1 Characteristics of Respondents

The respondents' percentage of gender, age group and education are presented in Table 4.2.

Table (4.2) Demographic Characteristics of Respondents

Gender	No. of Respondents	Percentage (%)
Male	121	49
Female	126	51
Total	247	100
Age Group	No. of Respondents	Percentage (%)
18 years old and below	16	6
35 years old and above	135	55
Between 18 and 25	56	23
Between 26 and 35	40	16
Total	247	100
Education Qualification	No. of Respondents	Percentage (%)
Illiterate	11	4
Monastic Education	2	1
Primary Education	17	7
Middle School Education	22	9

Table (4.2) Continued

High School	60	24
University/Graduated	135	55
Total	247	100

Source: Survey data, 2019

According to above Table 4.2, 51% of total respondents are from women, while 49% are men. Therefore in the survey, the interview comprised slightly more female percentage than male and studies show that women are more vulnerable to disaster rather than men.

Majority of respondents fall into the age group of 35 years old and above which represents 55% and this age group possess high maturity level for this study. The second largest group is between 18 to 25 years old representing 23%. Number of respondents who are under 18 years old are only 6%.

In terms of education level of respondents, most are university or college education level involves 55% and illiterate level includes only 4%, the survey shows that high level educated persons are a big percentage and it can be assumed that educated persons will have more knowledge and awareness of disaster and will know how to prepare for disaster than those with low education level.

4.3.2 Knowledge on Disaster Preparedness and Disaster Plans

Community members play a vital role in reducing the impact of a disaster. People at this level are often the most vulnerable to disaster and experience the greatest impacts for various reasons. Yet they are not passive victims. With knowledge of the local geology, the hazard context, and the livelihoods options available, local communities must be involved in disaster management programmes from the start, and supported by projects to develop the capacities and linkages that help overcome.

Table (4.3) Respondents' knowledge on disaster

No	Disaster knowledge	Female	Percentage (%)	Male	Percentage (%)
1	No	8	3	11	4
2	Yes	118	48	110	45
	Total	126	51	121	49

Source: Survey data, 2019

Table (4.4) Respondents' disaster preparedness knowledge

No	Disaster Preparedness Plans Knowledge	Female	Percentage (%)	Male	Percentage (%)
1	Yes	92	37	83	34
2	No	34	14	38	15
	Total	126	51	121	49

Source: Survey data, 2019

The aim of disaster preparedness is to minimize the impact of disasters on vulnerable populations, to ready an organization for an influx of activity, and to plan a coordinated strategy that reduces the waste of resources, time, and efforts. In the above Table (4.3), among 247 respondents, 228 persons said that they know what are natural disasters and its kinds as well. Only 19 people do not what disaster is. Also 175 respondents out of 247 know what the disaster preparedness plan is according to Table (4.4). Hence, 70% of respondents know and have disaster preparedness plan and knowledge.

4.3.3 Disasters Experience in Hinthada Township

Hinthada Township has been one of the severely flood-affected municipalities in the Ayeyarwady Region historically however more than half of respondents; 59% to be exact has never been encountered any disasters in their lives. Approximately 31% of respondents they faced floods and 14% faced storm disasters per Table (4.5). Hence Hinthada Township encounters floods and storm mostly.

Table (4.5) Respondents Experienced Disaster Types

No	Type of Disaster experienced	Female	Percentage (%)	Male	Percentage (%)
1	Dam collapsed	1	0	1	0
2	Earthquake		0	2	1
3	Fire	2	1		0
4	Flood	17	7	23	9
5	Flood (every year)		0	1	0
6	Flood and dam collapsed	2	1	1	0
7	Flood and Nargis		0	1	0
8	Flood and storm	6	2	8	3
9	Flood, fire and earthquake		0	2	1
10	Flood, storm and dam collapsed	1	0		0
11	Flood, storm and earthquake	1	0		0
12	Nargis	3	1	6	2
13	Nargis and flood	2	1	1	0
14	Nargis and Tsunami	1	0		0
15	Storm	10	4	10	4
16	Tornado		0	1	0
17	violent winds experienced	1	0		0
18	Never experienced one	79	32	64	26
	Total	126	51	121	49

Source: Survey data, 2019

4.3.4 Chances of disasters occurrence

Although Hinthada was not affected by Nargis, yearly flooding occurs in some village tracts and villages and some villages have experienced landslides. It is controversial that 46% of respondents think that disasters are unlikely to happen in Hinthada as they possess indigenous knowledge that most of the residents are pious. However 54% of respondents think that disasters are unpredictable and can occur at any times. They also claim that disaster awareness and protection is very important for the community.

4.3.5 Disaster planning knowledge

The basic structure for disaster planning includes the four phases of comprehensive emergency management: mitigation, preparedness, response, and recovery. Plans should evolve as new lessons are learned, information is obtained, and priorities are updated. Regular reviews of the plan should occur and updates made after organizational or resource changes, major exercises, events, activations, or if the external environment changes. Reviews should occur annually or at a minimum every 2 years.

Table (4.6) Needs of Disaster Preparedness Plans

No	Disaster Preparedness Plans Needed	Female	Percentage (%)	Male	Percentage (%)
1	Yes	113	46	107	43
2	No	13	5	14	6
	Total	126	51	121	49

Source: Survey data, 2019

From the above Table (4.6), 89% of respondents think that disaster plans are needed for their wards and villages regardless of their assumptions in disaster occurrence. As a result, although respondents have indigenous knowledge regarding disasters almost all respondents are aware of the importance of disaster awareness knowledge and protection.

Table (4.7) Knowledge of Disaster Plans

No	Disaster Preparedness Plan for Your Region	Female	Percentage (%)	Male	Percentage (%)
1	Yes	58	24	71	29
2	No	25	10	18	7
3	I have no idea	43	17	32	13
	Total	126	51	121	49

Source: Survey data, 2019

Respondents answered that government has disaster preparedness plan for their wards and villages when disasters occur per Table (4.7). 129 people out of 247 respondents answered that there's a plan for disaster preparedness as Disaster Management Training Center is in their town.

Table (4.8) Disaster Plans among Family Members

No	Developed a plan	Female	Percentage (%)	Male	Percentage (%)
1	No	48	19	44	18
2	Yes	66	27	66	27
3	I don't know	12	5	11	4
	Total	126	51	121	49

Source: Survey data, 2019

From the table above, 54% of respondents have discussed what to do and how to connect among family members when there is disaster. However 37% do not know and 9% totally do not know what the disaster plan for family members.

4.3.6 Information receiving sources regarding disasters

Information changes society and with the flow of electronic information, the edges for information sharing are endlessly becoming more diverse. Information is a vital public good whether processed or unprocessed. Information supports for disaster management, particularly for coordinating activities and communicating with relevant stakeholders.

Table (4.9) Receiving Disaster Information in the past 12 month

No	Get Information in past 12 month	Female	Percentage (%)	Male	Percentage (%)
1	No	106	43	97	39
2	Yes	20	8	24	10
	Total	126	51	121	49

Source: Survey data, 2019

Per Table (4.9), 44 respondents answered that they have received information or training on disaster preparedness in the past 12 month.

Regarding the sources of disaster information that respondents receive from in the past 12 month. 11 respondents answered that they received such information and training from government, 13 respondents said they received from radio, 18 specified from other sources such as Facebook and words of mouth and one received from NGO.

Furthermore most respondents receive disaster information from other sources such as Facebook and words of mouth which are quite unreliable sources and could be quite dangerous for disaster preparedness. It is found out that very few percentages read newspapers and journals however some responded they receive disaster information from radio which is quite satisfactory.

4.3.7 Knowledge on disaster protection

Local knowledge and practices can help implementing organizations to improve disaster preparedness activities. It is essential to learn how local people in a particular area view and interact with their environment. Local knowledge is dynamic and is always changing over time through experimentation and adaptation to environmental and socioeconomic changes (Thrupp 1989).

According to the World Health Organization (WHO), “Drills are coordinated, supervised activities that are normally used to test a single specific operation or function; their role is to practise or perfect one small part of the response plan.” Practicing what to do in an emergency before one happens can help individuals (coworkers, teachers, students, family members) feel more confident in their ability to handle an emergency and can help reduce stress at the time too.

Table (4.10) Respondents participations for drills

No	Disaster Drills Participation	Female	Percentage (%)	Male	Percentage (%)
1	Yes	23	9	26	11
2	No	103	42	95	38
	Total	126	51	121	49

Source: Survey data, 2019

From the above Table (4.10), only 20% of surveyed respondents have been participated in drills although 228 respondents think drills are useful for disaster preparedness from below the Table (4.11).

As the saying goes “Practice makes perfect” and it applies to disaster preparedness too. Although disasters are unpredictable and unexpected, we should do our best to prepare. Disaster drills are critical to provide experience and a sense of competence if there were disasters. Moreover drills are necessary for people to be trained to lessen the effects of disaster.

Table (4.11) Usefulness of Drills

No	Useful if there's Drill for Disasters	Female	Percentage (%)	Male	Percentage (%)
1	Yes	115	47	111	45
2	No	11	4	10	4
	Total	126	51	121	49

Source: Survey data, 2019

Although respondents think drills are very important and useful, drill practices are very rare in both wards and villages according to Table (4.12). Only 36% has experience in practicing drills in their community and the rest large percentage do not know about drills.

Table (4.12) Township and Village Practice Drills

No	Your Township/Village practice Drills	Female	Percentage (%)	Male	Percentage (%)
1	Yes	41	17	47	19
2	No	35	14	32	13
3	I don't know	50	20	42	17
	Total	126	51	121	49

Source: Survey data, 2019

4.3.8 Evacuation for disasters

The best way to cope with a natural disaster is to prepare by having a plan before it strikes. As a result of disasters, people may be injured or killed, or may lose their homes and valuable possessions. It is important to protect your family, home, business and assets from such events.

Table (4.13) Knowledge on evacuation

No	Evacuate Place	Female	Percentage (%)	Male	Percentage (%)
1	Move to other town	8	3	4	2
2	Move to hill area	11	4	22	9
3	Move to Monastery or community hall (Dhamma Yone)	13	5	11	4
4	Move to Shelter house	83	33	69	28
5	All mentioned above except nowhere	4	2	8	3
6	One and / or 2 above mentioned	5	2	7	2
7	Do not move to other town	2	1		0
	Total	126	51	121	49

Source: Survey data, 2019

152 out of 247 respondents know when there is an alert for evacuation. Many of the respondents plan to evacuate to shelter houses organized by government while 33 respondents will move to hill areas.

An evacuation is the immediate and urgent movement away from a threat or hazard. Evacuations are more common than people realize and may be optional or mandatory. Disasters often force people to leave their homes, neighborhoods, cities and sometimes even states on short notice.

Table (4.14) Disaster knowledge and training for school children

No	Part of Education System	Female	Percentage (%)	Male	Percentage (%)
1	Yes	117	47	114	46
2	No	9	4	7	3
	Total	126	51	121	49

Source: Survey data, 2019

From the above table (4.14), 231 respondents strongly think and suggest that school children should know disaster awareness and trainings as well as disaster knowledge and preparedness should be part of the school curriculums.

CHAPTER V

CONCLUSION

In order to learn people knowledge on disaster awareness and protection in Hinthada Township, the survey is carried out 247 respondents from the urban and rural area of Hinthada Township. This chapter presents findings and recommendations.

5.1 Findings

Regarding for the disasters experienced in Hinthada Township, flood, storm and dam collapsed are the most major disasters for the township. As Hinthada Township is disaster prone area, 90% of respondents had the disaster experience such as floods, fire, storms and dam collapsed including Nargis. 69% of respondents know what the disaster plan is and 129 people know their region has disaster preparedness plan. 90% of respondents think that drills are very important for disaster preparedness but only 20% of surveyed respondents have been participated in drills including one respondent mentioned that he participated drill at the Hinthada University.

Concerning community knowledge on the causes of disasters, among 247 respondents; 231 persons said that they know what are natural disasters and its kinds as well. Only 19 people do not what disaster is. Also 175 respondents out of 247 know what the disaster preparedness plan is. Hence, 70% of respondents know and have disaster preparedness plan and knowledge. Although community has fair amount of disaster knowledge, there are many wrong responses in disaster preparedness and protection. On the perception of community 46% of respondents think that disasters are unlikely to happen in their wards, villages and village tracts. It is a good thing to learn that 44 respondents answered that they have received information or training on disaster preparedness in the past 12 months. Among them 11 respondents answered that they received such information and training from

government, 13 respondents said they received from radio, 18 specified from other sources such as Facebook and words of mouth and one received from radio. Respective authorities should be aware and educate that people should rely on trustworthy news sources for disasters.

One of the positive results is that 233 respondents think that it is a good idea to include disaster awareness, preparedness and protection lessons in the school curriculums. They also suggest Village and Township Disaster Management Committees to organize disaster awareness talk and educational activities at schools, universities and communities in Hinthada Township.

5.2 Recommendations

We cannot stop natural phenomena from happening. But we can make them less damaging if we understand better why they happen, and what we can do to prevent or mitigate them. Since people are partly responsible for disasters happening, we have to change what we are doing wrong, in order to avoid or reduce the impact of natural phenomena. Every community must get to know its own features and surroundings: the natural environment as well as environment built by human beings. This is the only way for a community to manage the hazards that surround it and to reduce its own vulnerability to these hazards.

Newspapers, radio and television can help you to learn more about disasters and disaster prevention. School activities can be useful too. Making drawings about what you have learned can help you to understand disasters and disaster prevention better and to explain them to other people. Talk to your family, friends and people you know about the way risks can be reduced in your community. Get together with your family to spot safe places; convince your parents that your family should have an Emergency Plan.

Government and concerned stakeholders should conduct more public awareness sessions and trainings up to village, village tract and ward level which is the most effective way to enhance the community knowledge and resilience. It is required to disseminate disaster awareness IEC materials such as posters and pamphlets should be disseminated to all households and to disseminate those in crowded places as well. Media such as radio and FM play a vital role in conveying message to grassroots level, hence, to broadcast many awareness programs in more

television, radio and FM channels with multi approaches for disaster awareness message to reach to community level. Moreover, it is also crucial to conduct disaster drill exercises with community so that individual such as coworkers, teachers, students, family members can help each other and feel more confident in their ability to handle disaster situation and can help reduce stress at the time too. It should deliver trainings on first aid to community in order to treat people in the emergency situation as well.

Most importantly, government should allocate sufficient budget for disaster knowledge, awareness and protection. To develop public awareness strategy considering the comprehensive ways and approaches to get more active participation of community in awareness sessions and community participation to be improved to discussion and decision-making level. Government should develop strategy for family level preparedness in order to encourage all families to develop family level preparedness plan at all households which includes discussions in advance what to do for disasters and also to specify the points/ places where family members can meet after the disasters in order to avoid separation of family members. It is also better to conduct awareness sessions at all schools and encourage to children to share back their knowledge with adults at home which is also a kind of knowledge dissemination channel. Disaster awareness lessons in the school curriculum should be more actively taught and should be part of exams. Government should strengthen the law, policies, rules and regulations and allowing businesses to work ethically without harming environment and causing consequences to disasters and hazards.

It is also essential to establish early warning systems, spending budget for weather satellite and sending disaster messages via mobile in disaster prone areas. In disaster management, government needs to collaborate and coordinate with respective departments, development committees, Fire Brigade, Police forces, Red Cross, community-based organization, civic society organization, NGOs, INGOs, community leaders, private sectors, institutions, media and also community including children, teachers, women, people with disability and so on.

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APPENDIX

Appendix Survey Questions (Community)

Data Entered By: _____ Date: ____ / ____ / 2019

ID No. _____

INTRODUCTION AND CONSENT

Hello, my name is “ _____ ” and I am enumerator for a thesis survey of Ma Theingi Soe Naing for the Executive Master degree on Public Administration of Yangon University of Economics.

I would like to ask you some questions regarding natural disasters in your township. We are asking many people these questions in order to learn people’s awareness and sentiments. Your answers will be counted along with all the others. The questions will take 15 - 20 minutes.

This interview is confidential. Your name will not be appeared on this paper and your answers will be totally private. You don’t have to answer if you don’t want to. You may decline to answer any questions or stop the interview at any time.

Are you comfortable to answer these questions? YES NO

Survey questionnaires for “A Study on knowledge, attitude, preparedness and protection of disaster in Hinthada Township: Case study in Myanmar Disaster Management Training Center”

- Region Ayeyarwaddy Region
- Township Hinthada
- Ward
- Village/Village Tract
- Gender
 - Male
 - Female
- Age
 - 18 years or below
 - 18 – 25 years old
- Between 26 – 35
 - Education
 - Illiterates
 - Monastic school
 - Primary School
 - Middle schoolSchool

- High School
- University/Graduated
- Above 35 years old

Occupation

.....

I. Knowledge, Attitude and Practice

1. Do you know what disaster is? Yes / No

If YES, what are they?

- Floods
- River floods
- Heavy rain
- Storm
- Wind
- Forest Fire
- Earthquake
- All the above mentioned

2. Have you ever faced disaster in your life time? Yes/No

3. If YES, what types of disasters and how many times?

.....

4. Do you know there is a preparedness plan for disasters?Yes/No

5. Where can we find this preparedness plan?

- Newspaper/Journals
- TV/Radio
- Educational/ Awareness Talk for Disasters
- Public Center of Ministry of Information
- Internet/Facebook

6. Have you participated in drills for disasters?Yes/No

7. If YES, when and where and how many times.....

8. If YES, do you understand the function during the drills?Yes/No

9. Do you think disaster drills are useful?Yes/No

10. Do you think school children should do disaster drills as well?Yes/No

11. Do you think disaster preparedness plans are useful

when there is disaster?Yes/No

12. We should know these disaster preparedness plans. Yes/No
13. Government should educate public these disaster preparedness plans. Yes/No
14. These disaster plans for only few (rich) people in our community. Yes/No
15. Disaster should be categorized and alert public accordingly. Yes/No
16. There must be trainings and educational programs for disaster preparedness and protection plan. Yes/No
17. These disaster plans should be mandate and update accordingly to catch up with times. Yes/No
18. InHinthada, we have very low possibilities of occurring disasters. Yes/No
19. Respective authorities/ministries should lead drills for disaster for people in disaster prone areas. Yes/No
20. Have you received information or training on disaster or emergency preparedness in the past 12 months? Yes/No
21. On a scale of 1 – 5, how important do you believe the involvement of your community is in responding to flooding, with the assistance of other public services/organisations? (Please circle appropriate level)
- | | | | | |
|--|----------|----------|----------|----------|
| 1 | 2 | 3 | 4 | 5 |
| Not important; Slightly important; Moderately Important; Very important; Extremely Important | | | | |
22. What is the last disaster that you had faced in the past 12 months?
.....
23. Do you know how economically affected in your community because of that disaster?
.....
24. Do you think your community has the necessary information and/or resources to be ready for flooding? Yes/No
25. Are there any other comments you would like to make in relation to flooding matters?
.....
26. After the disasters, do you know who help for rehabilitation/resettlement?
- Government
 - LNGOs
 - INGOs
 - Private

- o Self

27. Do you agree disaster awareness and preparedness should part of school lessons?Yes/No

28. If YES, do you want to suggest or comment what to include
.....

II. Preparedness and Protection

29. Have you developed a plan for your pets, livestock, or other animals in your care during a disaster?Yes/No

30. Do you have an out-of-province disaster telephone contact?Yes/No

31. Has your family discussed where to meet outside if there is a disaster?Yes/No

32. Do you know at least three ways you can become better prepared to handle a disaster?
.....

33. Do you know what to do if asked to "evacuate"? Yes/No

34. Do you know what to do if asked to "shelter-in-place"?
.....