

**KNOWLEDGE ON THE DISASTER RISK REDUCTION (DRR) AMONG THE
YOUTH RESIDING AT KATHMANDU VALLEY**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree

of Master of Business Administration (MBA)

in

Rural Management

by

Sabin Khanal

Under the Supervision and Guidance of

Dr. Ratna Verma

2021

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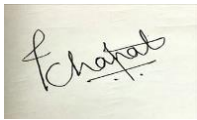
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2021

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Knowledge on the Disaster Risk Reduction (DRR) among the youth residing at Kathmandu Valley** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

A handwritten signature in black ink, appearing to read 'S. Khanal', written on a light-colored, slightly textured surface.

(Signature)

Sabin Khanal

4th July 2021

CERTIFICATE

This is to certify that dissertation titled **Knowledge on the Disaster Risk Reduction (DRR) among the youth residing at Kathmandu Valley** is a record of the research work undertaken by Sabin Khanal in partial fulfillment of the requirements for the award of the degree of MBA (Rural Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur

Date

School Dean
IIHMR University, Jaipur

Date

CERTIFICATE

This is to certify that Sabin Khanal in partial fulfillment of the requirements for the award of the degree of MBA (Rural Management) from the IIHMR University, Jaipur has successfully completed his internship at Save the Children, India during March 22, 2021 to June 19, 2021.

Place: Kolkata, West Bengal
Date: June 4

Preceptor: Ms. Susmita Gua
Name of the organization: Save
The Children

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Sabin Khanal

MBA-RM

2019-2021

Knowledge on the Disaster Risk Reduction (DRR) among the youth residing at Kathmandu Valley.

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Abstract

Background: Nepal's Himalayan area is considered one of the world's most dangerous flood hazard zones. Landslides are common in the middle Hills, and floods and fires are common in the Terai. As a result, disasters such as floods, landslides, and fires are common in Nepal. These disasters strike almost every year in the country, claiming many lives and wreaking havoc on property. As country having high number of youth (16-40 years), awareness and knowledge about the disaster in this population group is important for disaster preparedness and disaster response.

Methods: The data for this study is collected through web based method using self-administered semi structured questionnaire. The total respondents for this study is 110, where the study is been conducted on socio demographic characteristics, awareness level and disaster cycle. The data are further calculated on Likert scale, chi-square and association were seen by cross tabulation.

Major findings: The respondents receive information from the internet and there seems to be no association between education and awareness of the disaster however the disaster (Metrological) that is not occurred on the country is found to have association with education. It can be further say that experience on the past disaster enriches the awareness about disaster. And stakeholders plays important role on creating awareness.

Conclusion: Since the past experience also plays significant role on creating the awareness of the people, thus guiding them through authentic information by proper means of communication also plays crucial role in order to prevent from misleading the information.

Keywords: Awareness, Disaster, DRR, Hazard, Information, Knowledge

ABBREVIATIONS

BCT	Brahmin, Chhetri, Thakuri
CCA	Climate Change Adaptation
DMA	Disaster Management Act
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
DRRM	Disaster Risk Reduction Management
GDP	Gross Domestic Produce
GLOF	Glacier Lake Outburst Flood
HFA	Hyogo Framework for Action
IIHMR	Indian Institute of Health Management Research
LSGA	Local Self Governance Act
LGOA	Local Government Operation Act
MoHA	Ministry of Home Affairs
NDMR	Natural Disaster Management Regulations
NGOs	Non-Government Organizations
NNPC	Nepal National Planning Commission
PDNA	Post Disaster Needs Assessment
Ph.D.	Doctor of Philosophy
SFDRR	Sendai Framework Disaster Risk Reduction
SPSS	Statistical Package for Social Science
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
USD	United States Dollar

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Chapter 1

Introduction

Background of the study

Nepal is a landlocked country of South Asia and lies between two big nations China at North and India at East, West and South. With its fragile geology and steep topography, country exposed to various disaster. Nepal ranked 11th in earthquake risk globally, and 20th in disaster risk worldwide. Country has been subjected to some 500 incidents of disaster including earthquake, landslides, flooding, glacier outbursts, and forest fires / bush fires World Bank reported that over the same period, country incurred economic losses are estimated at \$7.8 billion.

In terms of relative sensitivity to climate change, earthquakes, and flood hazards, Nepal ranks 4th, 11th, and 30th among 200 countries worldwide, respectively. Nepal is the world's 20th most disaster-prone country because to its diverse climate and insecure geographical and topographical circumstances. Floods, landslides, earthquakes, fires, hailstones, windstorms, thunderbolts, cloudbursts, droughts, GLOF, avalanches, and epidemics are all natural hazards with large magnitudes and intensities.(1). Geological, biological, and hydro-meteorological phenomena; demographic trends, such as rapid population expansion and increasing population density; and a high level of environmental deterioration, deforestation, land fragility, widespread poverty, unsafe building practices and lack of enforcement of building codes, unplanned urban development, inadequate emergency preparedness and lack of awareness, political instability and conflict, and topography that poses significant infrastructure challenges are some of the factors that contribute to increased disaster vulnerabilities.(2).

Nepal's 2015 earthquake has claimed 8,790 lives and injuries to 22,300 people, 50 of whom are injured foreigners and 70 are demised(3). It has affected eight million people, or nearly one-third of Nepal's population, and thirty-one of the country's 75 districts (77 districts as of August 21, 2017) have been affected, with fourteen of them being classified "crisis-hit" for seeking to prioritize rescue and relief efforts. By the end of 2017, Nepal Seismological Department has reported 213807 earthquakes out of which 108007 are local & regional. The devastating 2015 earthquake impaired the livelihoods of two million twenty eight hundred thousand households and eight million people in thirty-one districts, with overall damage and losses of NRs 28.4 billion (USD 284 million) (4) The PDNA report of the Nepal NPC (5) suggested that people under poverty line have been rocketed and in 2015 only, figured reached to seven hundred thousand. Additionally, study shows poorer and vulnerabilities are adversely impacted by the disaster since they couldn't tap.

Disaster risk reduction (DRR) plays a significant role on encouraging a deliberate and efficient strategy to reduce risks and vulnerabilities. DRR is a systemic approach to recognizing, evaluating, and reducing disaster risk that aids in reducing a society's or community's vulnerability. It also aids in the prevention or reduction of the negative effects of natural

disasters, allowing for more long-term growth¹. The HFA: Building the Resilience of Nations and Communities to Disasters was adopted at the second world conference on disaster reduction in Japan in 2015. All countries must use awareness, creativity, and education to promote a culture of safety and resilience at all levels, according to the HFA. Furthermore, it indicates that disasters can be greatly reduced if individuals are well-informed and encouraged about how to reduce vulnerability.

Purpose of Research

This study on the topic, Knowledge on the natural Disaster Risk Reduction (DRR) among the youths residing at Kathmandu Valley is conducted by identifying three independent variables such as Socio-demographic, Awareness level and Disaster cycle. The data were collected through web based method using self-administered semi structured questionnaire. Total sample size of 110 was taken to complete this study. This study mainly focused on understanding the level of knowledge of youths regarding DRR and also assess their preparedness and response strategy for next emergency situation. The study site is limited to Kathmandu Valley and individuals residing outside Kathmandu is not been considered for conducting this study.

Statement of Problem

DRR is especially important for maintaining the achievement of all kinds of development goals because it offers a safety-net for a developing country's hard-won development gain (6). Over the last decade, both national governments and development agencies have identified effective disaster risk reduction for communities in developing countries as critical to their sustainable development. Thus, knowledge on the DRR plays an important role.

Study has found that the majority of people lack site-specific disaster awareness, and their anxiety levels are similar in the face of all types of disasters. Similarly, it has been verified that the Nepalese DRR education initiatives are insufficient. The line agencies (that is, governmental and NGO that have been engaged in DRR activities in various communities of Nepal) say that the DRR concept and disaster education are now working in the local communities, and that all local people have been gaining DRR knowledge through awareness campaigns, trainings and meetings. However, the ground reality indicates the situation is still incoherent (7).

Despite the fact that disaster education programs in Nepal are performing good or satisfactorily UNESCO and UNICEF(8), review findings indicate that people are more likely to feel insecure in the face of all types of disasters due to lack of knowledge on the preparedness. Some of the study has also states that people are aware about the chances of facing different form of natural hazard but still they lack the confidence to respond and mitigate the impact. More specifically, the lack of a proactive DMA and Policy has been identified as one of Nepal's major roadblocks to disaster governance.

¹Kameda H. Networking disaster risk reduction technology and knowledge through Disaster Reduction Hyperbase (DRH). In Proceedings of the disaster reduction hyperbase (DRH) Contents Meeting, Kobe, Japan 2007 Mar (pp. 12-13).

In addition, the DRR operations are restricted in carrying out immediate rescue and relief works on an ad-hoc basis, which is another source of concern among disaster-affected populations and disaster management professionals⁽⁹⁾. Therefore, this study is being conducted to understand the present context of DRR knowledge in the youth population of Kathmandu valley and their understanding on the response and preparedness.

Context and Importance of the problem

Geographically, Nepal's Himalayan area is considered one of the world's most dangerous flood hazard zones. Rainfall intensity, excessive moisture, and the slope of watersheds and river courses all influence flood magnitudes. In the middle Hills, landslides are widespread, and floods and fires are common in the Terai. As a result, natural disasters including floods, landslides, and forest fires are common in Nepal. Almost every year, calamities hit in some region of the world, claiming countless lives and wreaking damage on property.²

According to several government estimates, floods, landslides, fires, avalanches, and epidemics have killed hundreds of people and destroyed property worth millions of dollars over the last 30 years. They also have a negative effect on the development program of the nation. Aside from the above reasons, catastrophe losses are increasing due to a lack of effective disaster management plans, regulations, and preparedness and risk mitigation programs. Existing disaster laws do not cover all aspects of disasters because they are limited to immediate disaster response. As a result, the emphasis on disaster response and relief is narrow rather than comprehensive approaches that include preparation, preparedness, and recovery³. Every year, landslides, floods, and other natural disasters cause a significant amount of the country's GDP to be lost. Inadequate public awareness, a lack of disaster preparedness, inadequate governance, and a lack of cooperation among government institutions, as well as a lack of financial resources, lack of technical resources are all contributing factors. (7).

Aim of the study

Despite lots of work and programs have been implemented in the country by different stakeholders (government, development organization, humanitarian agencies and other associated actors), the knowledge on the DRR and preparedness to the disaster is still insufficient for the country like Nepal which is natural-hazard-prone. Therefore, the study aims to understand the level of knowledge of DRR in youths of Kathmandu valley and how youths have prepared and planned for the next disaster.

Objectives of the study

The objectives of the study are:

1. General:

² Khanal, N.R. (1998), "Water Induced Disaster in Nepal", A Paper Presented in an International Seminar on Water Induced Disaster held from 4 to 6 November, 1998 in Lalitpur, Nepal.

³ Poudyal Chhetri, M.B. and Bhattarai, D. (2001), "Mitigation and Management of Floods in Nepal," a book published by, GoN, Ministry of Home Affairs, Kathmandu, Nepal.

- a. To access the level of knowledge on DRR among youths of Kathmandu Valley
- 2. Specific:
 - a. To identify socio-demographic factors that may influence the knowledge of DRR.
 - b. To determine the knowledge regarding disaster response and preparedness.

Chapter 2

Literature Review

Authors (year)	Study location	Sample size	Sampling techniques	Salient features
A.C.K Lee (2016) Barriers to evidence	Nepal	11	Key Informants of Disaster, Qualitative	*Putting 'best practice' in disaster management into reality in Nepal is plainly difficult and time-consuming. *There are knowledge gaps that make it difficult to plan and implement effective catastrophe mitigation strategies. Due to an apparent lack of demand for the evidence, respondents reported having difficulty accessing it and having difficulty acquiring it.
Samantha Jones, Katie J. Oven, Ben Wisner (2015)	Nepal	12 people	Empirical Study, FGD and KII	*In both Bihar and Nepal, public commodities such as power, water, and healthcare are in short supply, with development efforts focused mostly on metropolitan areas. Furthermore, both places have substantial socioeconomic disparity based mostly on caste and race.
Samantha Jones, Katie J.a Oven, Bernard Manyena, Komal Aryal (2014)	Nepal	26 Qualitative Interview	KII	* The current emergency management legislation in Nepal (The Natural Disaster Relief/Calamities Act), which goes back to 1982, is still predominantly relief-

Gangalal Tuladhar (2012)	Nepal	Secondary Source	Desk Review	oriented. Despite the fact that a new Act was drafted in 2006 (with the assistance of Oxfam), the current or previous Constituent Assembly did not prioritize its ratification. *In the absence of proactive emergency management policies, laws, and preparedness and risk reduction programs, disaster losses are increasing. * One method to reduce the issues of DRR is to educate and raise public awareness through educational reform, literacy, and community outreach *Advancement in technology including the development of early warning. * A new agency should be established to handle the entire catastrophe preparedness, mitigation, response, and recovery process.
Gangalal Tuladhar, Ryuichi Yatabe, Ranjan Kumar Dahal and Netra Prakash Bhandary (2015)	19 districts of Nepal (Rural Communities)	124 local people from 18 to 74 years of age	Random selected for survey questionnaire	*More than thirty-percent of the respondents were found to be familiar with disaster-related information. *Approximately eighty percent agreed that catastrophe risk training is important for them. *This finding implies that both governmental and nonprofit organizations'

Jorn Birkmann,
Korinna von
Teichman (2010)

Nepal

Secondary Desk
Source Review

disaster information awareness programs at the local level are doing satisfactorily and the people are rather encouraging about gaining disaster-related knowledge.

* There are flaws and limits in communicating DRR information to Nepal's local communities.

* Climate change has been blamed for the majority of the increase in the hazard.

*Lack of basic information in specific region (for instance records on local climate crisis, seasonal weather forecasts, and patterns of extreme weather events) might lead to a lack of norms, indicators, and standards that could aid in the integration of Disaster Risk Reduction and Climate Change Adaptation.

* Some critical data, such as social and economic census data from dynamic areas with large population changes and economic instability, is not available at all, making it impossible to identify shifting vulnerabilities and establish suitable adaptation plans.

* The gaps and conflicts between scientific and local/traditional knowledge pose a significant obstacle to

Ksenia Chmutina, Joanne Rose (2018)	Nepal's Banepa Town	Single	Qualitative Case Study 92 respondents	establishing a common knowledge basis for DRR and CCA. Local knowledge has been used to corroborate or refute scientific models in some circumstances, assisting in the generation of local trend data. *There exist a gap on understanding DRR between communities and the planner. * Downscaled climate data and predictions of probable catastrophic occurrences are in desperate need of improvement. *At the international and national levels, a common and accessible knowledge management platform for many actors, notably state and non-state players, should be built. * There seems to be a disparity between attitudes and understanding, which are usually related to dominant assumptions in the market (like belief, practice, and gender). *Informal construction stakeholders have a high level of risk assessment and understanding significance of DRR procedures. *The quality of knowledge an individual has does comprehension of what is necessary and how
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Ouejdane Mejri New Zealand
And Giulia Pesaro
(2015)

information is disseminated to all parties involved.

*To advance professionally education is unimportant; experience is the most important factor.

*Experience was frequently mentioned as a key factor in supporting resilience development.

* The access to training is restricted; the primary method of getting information and experience is through on-the-job training. However, in order to enhance their experience, they must learn on the job. The majority of interviewees stated that they use knowledge regarding DRR measures in their work.

* There is a breach between translating understanding into action.

* Traditional knowledge management systems often allow for the organization and sharing of knowledge, but this is insufficient for the transformation of knowledge into wisdom and action; for us, participation in a communal learning/teaching/transmitting environment is required.

* It's also critical to recognize how critical it is to envision a space, both physical and virtual, where

Neeraj Dangol, Sandra Carrasco (2016)	Kathmandu, Nepal	40	Semi- structured interviews of 3 river-bank	fragmentation can be overcome and communication among knowledge stakeholders may be enabled, resulting in active engagement and fruitful exchange. *One of the key goals of DRR, as well as one of the primary issues, is to develop communal understanding from a prevention viewpoint. *One of the key goals of DRR, as well as one of the primary issues, is to develop collective knowledge from a prevention viewpoint. The absence of property rights on knowledge generation and the mechanisms that facilitate knowledge flows is the main distinction observed in the DRR implementation. As a result, we identify a public arena in which subjects produce, communicate, and use knowledge. * Family member recognized their equivalent roles and took steps to preserve their families by implementing adaption strategies. Some locals also realized that for flood adaption, economical stability was more crucial than gender leadership. * Age and gender are elements that challenge people' abilities and may
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exacerbate community
inequalities and limits

*It was supposed to have an
impact on citizens' behavior
in terms of mutual
participation in order to
implement flood-prevention
measures due to Ethnicity
and caste inequality.

*Occupation has significant
relation, especially in the
adaptation process.

* Residents' perceptions of
the impact of education on
flood adaptation were mostly
focused on the ability to
think of better adaption
options and a greater
understanding of hazard
threats. Thus, the educative
status of people has greater
differences on the adaptation
and prevention.

* In many cases, women's
contributions to building and
oversight have been valued
equally to men's.

* Collaboration and
coordination between
neighbors were shown to be
essential social
characteristics because they
provided mutual benefits,
resulting in coordinated built
adaption measures to lower
flood risk.

* Impact of neighborly
relationships on flood
adaptation.

Pashupati Nepal, Narendra Raj Khanal, Bishnu Prasa, Pangali Sharma (2018)	Nepal	Secondary (Policy Review)	* In order to effectively manage disasters, communities must be educated and made more informed. * Community-based organizations can play an important role in distributing disaster-related information. *The community did not have the awareness to Early Warning System * Conflicts between multiple Acts, such as the Water Resource Act (1992) and the Building Act (1998), and the Local Government Operation Act 2017 can be seen as key roadblocks in the disaster management act's implementation. * In this scenario, policy formation and institutional setup alone will not produce much intended output unless they are matched by the ability and competence to operationalise the intent of the applicable acts and policies, i.e., disaster preparedness, response, rehabilitation, and mitigation.
Meen B. Poudyal Chhetri (2016)	Nepal	Secondary (Desk Review)	* Courses on disaster management should be incorporated in education system and there should be various sorts of public awareness campaign * As this industry in Nepal is

Amod M Dixit , Kathmandu
Laura R Dwelley- valley
Samant , Mahesh
Nakarmi , Shiva B
Pradhanang and
Brian E Tucker
(2014)

still in its infancy, early-warning mechanisms must be established.

* NDMR and amendments to the existing Act are required to define and explain the duties and responsibilities of the entities involved in disaster management.

*Mass public awareness is another problem identified on the study and technology plays a significant role to mitigate this problem.

* The action plan formulation was design to educate policymakers about the importance of taking action. The action plan was created by asking policymakers which initiatives would be most viable in the current political context in Nepal.

* The school earthquake safety program focused on informing headmasters about their risk and how they may mitigate it. The structural safety of each school was classified using low-tech approaches so that headmasters could participate in and learn from the process.

* Emphasis on community level work is important

Juergen
Weichselgartner,
Patrick Pigeon
(2015)

France

*Continual disasters around the world remind us that we need to improve our scientific understanding and policy action on DRR

* DRR policy needs to be oriented towards reducing social vulnerability

*When it comes to the crucial transformation of knowledge into wisdom, a higher commitment is required.

*Knowledge is created and transferred through social interactions

*Requires comprehensive efforts in the areas of information and knowledge management capacity and skill development.

Roman Hoffmann
and Raya Muttarak
(2017)

Thailand and
Philippines

Sample size
= 1,310
from
Thailand
and sample
size=889
from
Philippines.
(female
only)

Survey of
adults aged
greater than
15 years

*When socio-demographic and contextual factors are taken into account, it is discovered that formal education increases the inclination to prepare for disasters.

*The fundamental mechanisms that explain the impacts of schooling are largely context-dependent.

*Education enhances abstract reasoning and anticipatory capabilities, allowing the more educated to adopt preventive steps without first having to experience the damaging occurrence and then learning

Javiera V. Castañeda Chilean coast 1504
 , Nicolás C. Adults
 Bronfman, Pamela
 C. Cisternas,
 Paula B. Repetto
 (2019)

Interview

afterward.

* The highest level of readiness comes from the following previous experience and more frequent exposure to natural disasters.

*Middle-aged adults (30–59 years old) claim to be the best prepared, especially if they live with a spouse and have a better education and employment.

Theoretical Framework

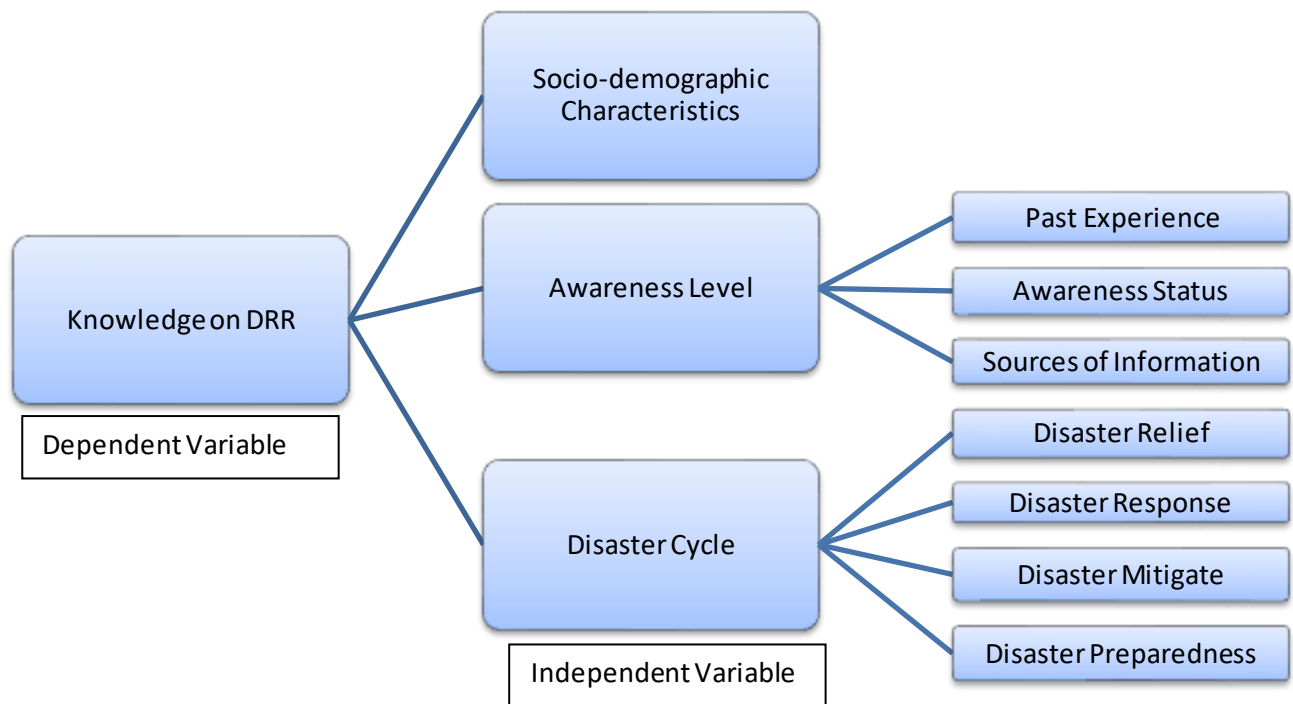


Figure 1: Theoretical Framework

The figure 1, illustrates the theoretical framework of the study. In this study, Knowledge on DRR is dependent variable. On the other hand, independent variables of the study are: Socio-demographic characteristics, Awareness status and Disaster cycle.

The socio-demographic characteristics consist age, gender, ethnicity, education status, education level, marital status and professional involved. The Awareness Level consists of past experience,

awareness status of natural disaster and sources of information. Disaster cycle inculcate four different stages of disaster like relief, response, mitigate and preparedness.

Chapter 3:

Methodology

Research Questions

The entire study will be based on the two questions:

1. What is the level of knowledge on DRR among the youths residing at Kathmandu valley?
2. What is the existing knowledge regarding disaster response, and preparedness among the youth residing at Kathmandu valley?

Study Variables:

Independent variable: Socio-demographic, Awareness Level, and Disaster Cycle

Dependent variable: Knowledge about disaster risk reduction

Study type:

Cross sectional study: To examine a large number of different variables at once, cross sectional study is been taken. This study allows looking at age, gender, income, and educational level in relation to youths' awareness and knowledge of DRR at once.

Description of the study:

This study design is a descriptive type of cross-sectional study which involves the study of a cross-section of population and uni-variate analysis of the data collected. A descriptive study describes the situations and events occurring at present. In this study, self-administered structured questionnaire was used to obtain the information about the knowledge on disaster risk reduction among youth population of Kathmandu Valley. Participants were selected as convenient because of the ongoing pandemic situation. The data in this study was collected by a questionnaire form developed through studies of various kinds of literature related to knowledge on disaster risk reduction among youth population.

Study setting:

Kathmandu Valley (Valley consist of three districts Kathmandu, Lalitpur and Bhaktapur). Valley lies on the Bagmati Province of Nepal.

Sampling Technique:

In this study, convenience sampling techniques was used for data collection. Participants were selected as convenient because of the ongoing pandemic situation of COVID-19.

Sample size:

110 Individual (Total 113 respondents have participated for survey however three respondents disagree to conduct the study till last and voluntarily leaved. So only 110 respondent's questionnaire is taken consideration for the study)

Study participants:

Youth participants belonging to 18-40 years of age were study population residing in the study area.

Inclusion criteria:

- Participants from age group 18-40 years of age residing in Kathmandu valley will be included in the study.
- Participants who give consent.

Exclusion criteria:

- Individuals who don't belong to 18-40 years of age group.
- Individuals residing outside Kathmandu valley.

Data collection tools and techniques:

Data collection method	Tools	Techniques
Web based (Enketo version of Kobotoolbox)	Semi-structured questionnaire	Self-administered questionnaire

In this study, data was collected through web based method using self-administered semi structured questionnaire. The questionnaire was prepared at Kobotoolbox and collected using the enketo version of kobo toolbox online. This semi-structured questionnaire had both open ended and close ended response which were used to collect information related to the knowledge of youth population related to disaster management process including knowledge on disaster relief, disaster response, disaster preparedness and disaster mitigation along with socio-demographic characteristics.

Pretesting:

Before the final study, pretesting was carried out in individuals with similar characteristic. Based on the pretesting of the questionnaire, necessary modifications were made to the tools. However, the findings of the pretesting were not included in the main analysis.

Methods to ensure data quality:

The quality of the data collected will be maintained throughout the study period. All filled and collected questionnaires were checked at the end of the day for accuracy and completeness.

Data management and analysis:

Data was collected from web based survey method and raw data was extracted from the web. Extracted data are re-verified and managed by editing, coding, and decoding. Thorough rechecking of the collected data was done to minimize the possible errors and ensure data quality. After that data was transferred for analysis in the SPSS software. Backup of data and information was done. Therefore, all the data generated are highly secured.

The quantitative data was measured by descriptive statistics; for understanding the distribution of data and cross-tabulation; to study the association between variables. Other statistical techniques like Chi-square and cross tabulation are also done.

Utilization of research findings:

The findings of the study are developed in the report and findings will be helpful for the government organization, development organization and one who works on disaster risk reduction program. Actors and stakeholders with a stake in the creation of a knowledge management system in DRR can use this study.

Limitation of the study

This study has two main limitations and that are:

1. This study doesn't focus about natural disasters, risks, impact, or climate change; rather, it is about what we understand and know about information that is "available" or not, and that can be handled (or not) differently than it is now.
2. This study studies only the age group of 18-40 years and who are residing at Kathmandu valley.

Ethical consideration:

Ethical Consent was taken from the faculty of IIHMR University. The study was conducted in compliance with all human rights and ethical standards. Informed consent was taken from the participants. The information that participants provide is only used in this study and is kept confidential. There are no potential risks involved as well as no direct benefit from participating in this study. Participation was entirely voluntary. The respondent can withdraw their consent or end involvement at any time from this study.

Operational definition:

For the purpose of this study, the following operational definitions will be used.

1. Knowledge: Understanding about the disaster cycle (relief, respond, mitigate and preparedness).
2. Socio demographic factors: It is defined by age, gender, marital status, occupation, educational status, past experience of disaster.
 - a. Age: In this study age is defined as Youth of aged 18-40 years of Kathmandu Valley. The Ministry of Youth and Sports(10) have classified the age from 16 to 40 years are youth. But, this study has studied only the age from 18 to 40 years.
 - b. Occupation: It includes the involvement of youth in the activities like: Business, labor/manual work, services, intern/volunteer and student.
 - c. Ethnicity: It is described as the ethnicity described by participants.
 - d. Education: It is defined as the educational attainment of participants that can be classified as illiterate, can read and write primary level, secondary level or graduate.
3. Natural Hazard: Natural hazards are events that occur naturally and as classified under geophysical (for instance, earthquakes, landslides, tsunamis, and volcanic activity), hydrological (for instance, avalanches and floods), climatological (for instance, extreme temperatures, droughts, and wildfires), meteorological (for instance, cyclones and storms/wave surges), or biological (for instance, disease epidemics and insect/animal plagues)(11)

Chapter 4

Results

Socio-Demography Characteristics

Table 1: Socio-Demographic Characteristics

Characteristics		Frequency	Percent	Cumulative Percent
Age	18-23	38	34.5	34.5
	24-29	51	46.4	80.9
	30-35	11	10.0	90.9
	36-40	10	9.1	100.0
	Total	110	100.0	
Gender	Male	55	50.0	50.0
	Female	55	50.0	100.0
	Total	110	100.0	
Ethnicity	Brahmin, Chhetri, Thakuri (BCT)	88	80.0	80.0
	Janjati	15	13.6	93.6
	Adhibasi	2	1.8	95.5
	Others	5	4.5	100.0
	Total	110	100.0	
Education Status	Literate	110	100.0	100.0
Education Level	Bachelor's Degree	66	60.0	60.0
	Master's Degree	40	36.4	96.4
	PhD, Post-doc	4	3.6	100.0
	Total	110	100.0	
Marital Status	Married	25	22.7	22.7
	Unmarried	85	77.3	100.0
	Total	110	100.0	
Professional involved	Business	10	9.1	9.1
	Service	47	42.7	51.8
	Intern/Volunteer	4	3.6	55.5
	Labor/manual work	2	1.8	57.3
	Student	47	42.7	100.0
	Total	110	100.0	

In this study, a total of 110 participants were included where majority 51 (46.4%) of the participants belonged to the 24-29 age group followed by 38 (34.5%) and few 11 (10%), 10 (9.1%) belonged to 30-35 and 36-40 age group respectively. The number of male and female

participants was equal in number. The majority 88(80%) were Brahmin, Chhetri, Thakuri (BCT) followed by 15 (13.6%) Janjati, 2(1.8%) Adhibasi and 5 (4.5%) said others. In this study, all the participants 110 (100%) were literate where more than half of the participants 66(60%) had completed their Bachelors 'degree followed by 40(36.4% completed their master's degree and some 4(3.6%) had completed their Ph.D., Post-doc. The majority 85(77.3%) were unmarried and most of them 47(42.7%) were either student or involved in service which was the highest followed by 10(9.1%) doing Business, 4(3.6%) Intern/volunteer and 2(1.8%) were doing Labor/manual work.

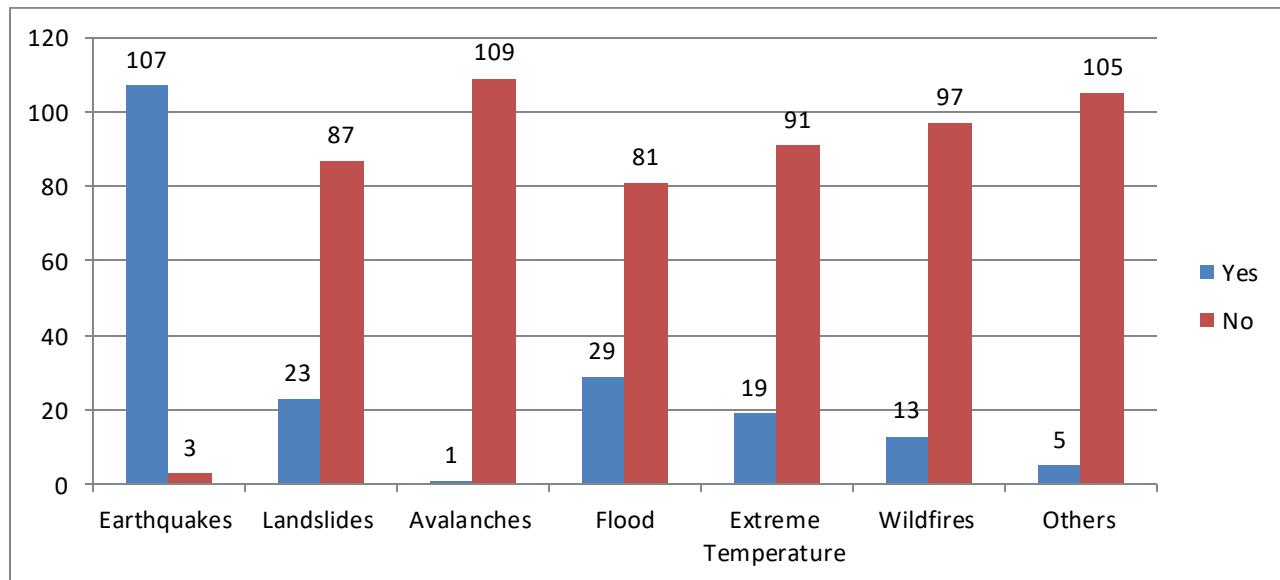


Figure 2: Experience of the different form of natural hazards

In the figure 1 illustrates that among the total participants (n=110), almost all (107 i.e. 97.27%) of the participants had experienced Earthquake in their life followed by (29 i.e. 26.36%) of the participants had experienced Flood, (23 i.e. 20.91%) landslide, (19 i.e. 17.27) extreme temperature and (13 i.e. 11.81%) Wildfires.

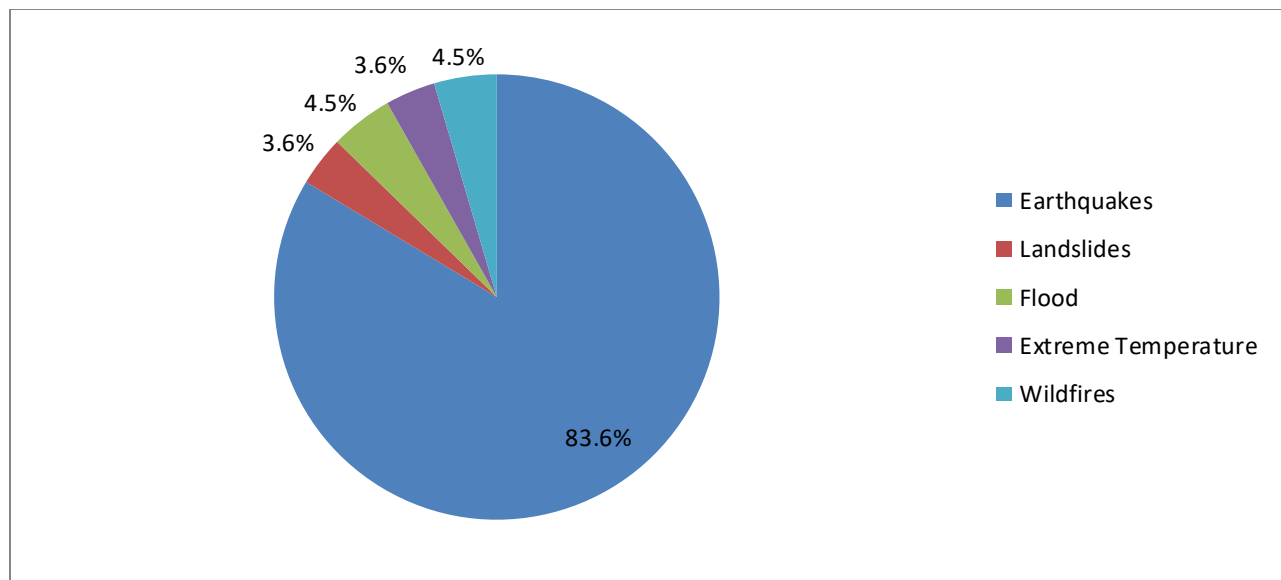


Figure 3: Last hazard Experienced

In the figure 2, a majority (83.6%) of the participants said that they had faced an earthquake recently while some (4.5%) of the participants said they had faced flood and wildfire and (3.6%) said Landslide and Extreme temperature.

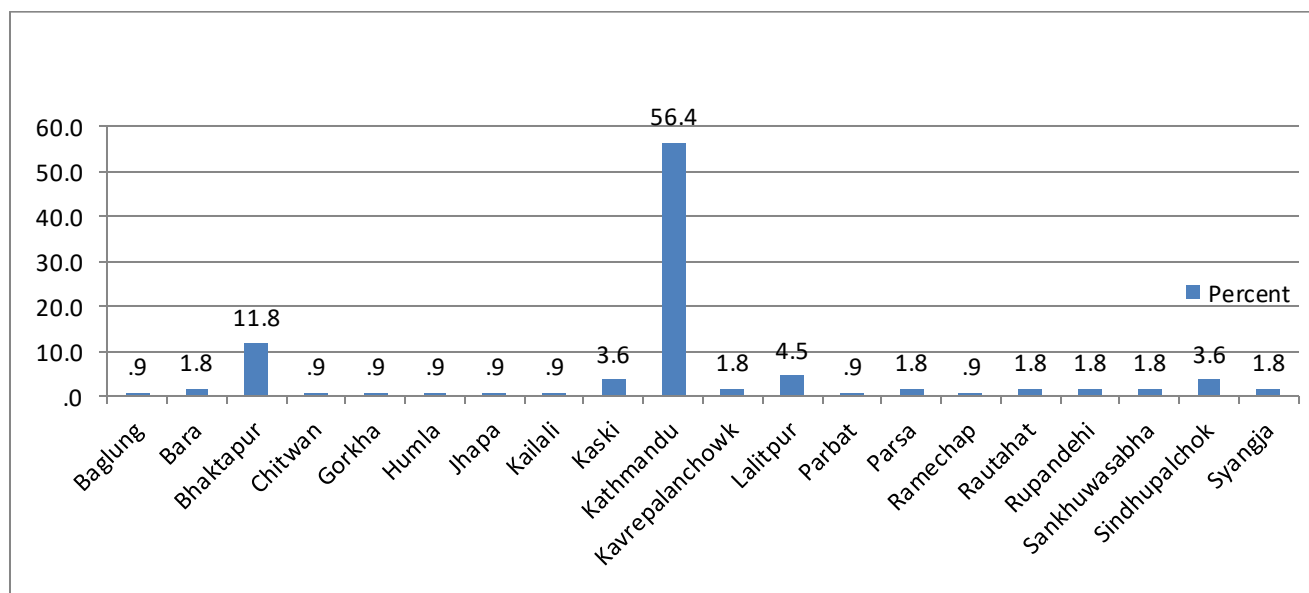


Figure 4: District on which respondents faced the disaster recently

This bar diagram on the figure 3 shows that more than half (56.4%) of the participants had faced the natural disaster in Kathmandu recently which was the highest followed by 11.8% in Bhaktapur and 4.5% in Lalitpur which indicates that most of the participants had faced the recent disaster in Kathmandu Valley. Besides Kathmandu valley, some of the participants (3.6%) had

faced the disaster in Kaski and Sindupalchowk districts recently with very few in other districts as well such as Baglung, Bara, Syangja, Rautahat, etc.

Table 2: Distribution between province and disaster faced recently

Under which province does it lies * Which natural disaster you faced recently? Crosstabulation							
		2.2 Which natural disaster you faced recently?					Total
		Earthquakes	Landslides	Flood	Extreme Temperature	Wildfires	
Province 1	Count(% within Under which province does it lie)	2(66.7)	1(33.3)	0(0)	0(0)	0(0)	3(100)
Province 2	Count(% within Under which province does it lie)	2(33.3)	0(0)	1(16.7)	1(16.7)	2(33.3)	6(100)
Bagmati Province	Count(% within Under which province does it lie)	80(90.9)	0(0)	3(3.4)	3(3.4)	2(2.3)	88(100)
Gandaki Province	Count(% within Under which province does it lie)	7(77.8)	2(22.2)	0(0)	0(0)	0(0)	9(100)
Lumbini Province	Count(% within Under which province does it lie)	1(50)	0(0)	0(0)	0(0)	1(50)	2(100)
Karnali Province	Count(% within Under which province does it lie)	0(0)	1(100)	0(0)	0(0)	0(0)	1(100)
Sudurpachim Province	Count(% within Under which province does it lie)	0(0)	0(0)	1(100)	0(0)	0(0)	1(100)

Total	Count(% within Under which province does it lie)	92(83.6)	4(3.6)	5(4.5)	4(3.6)	5(4.5)	110(100)
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The table 2 shows the association between the province and the type of disaster participants had faced recently. Among the total participants from province 1, they had faced two disasters; earthquake (66.7%) and landslide (33.3%) recently. In province 2, 33.3% of the participants had faced earthquake and wildfire while 16.7% had faced flood and extreme temperature recently. Moreover, the highest number of participants in Bagmati province had faced earthquake which was the highest (90.9%) followed by 3.4% had experienced a flood and extreme temperature and 2.3% faced wildfire recently. In Gandaki province, 77.8% of the participants had faced earthquakes while 22.2% had faced landslide recently. Half of the participants (50%) had faced earthquakes and the other half (50%) had faced wildfire recently in Lumbini province. Likewise, the landslide was only the natural disaster which the participant had faced recently in Karnali province while the flood was the only natural disaster that the participants had faced recently in Sudurpachhim province. Like this, in all seven provinces, 83.6% of all participants faced earthquake which was the highest followed by 4.5% faced flood and wildfire while 3.6% faced landslide and extreme temperature.

Experience from the Past Disaster

Table 3: Problem Faced from the last disaster

What problems did you encounter in the community when a disaster strikes?		Frequency	Percent	Cumulative Percent
Barriers to healthcare	No	53	48.2	48.2
	Yes	57	51.8	100.0
	Total	110	100.0	
Food shortage	No	54	49.1	49.1
	Yes	56	50.9	100.0
	Total	110	100.0	
Water shortages/contamination	No	67	60.9	60.9
	Yes	43	39.1	100.0
	Total	110	100.0	
Poor Sanitation/ Unsafe hygiene	No	54	49.1	49.1
	Yes	56	50.9	100.0
	Total	110	100.0	
Disease outbreaks	No	86	78.2	78.2
	Yes	24	21.8	100.0
	Total	110	100.0	
Displacement of Human Settlement	No	39	35.5	35.5

	Yes	71	64.5	100.0
	Total	110	100.0	
Others	No	104	94.5	94.5
	Yes	6	5.5	100.0
	Total	110	100.0	

The table 3 demonstrates that when the last disaster strikes, more than half (51.8%) of the participants had to face the problem of barriers to health care. Likewise, half (50.9%) had to face the problem of food shortage and poor sanitation or unsafe hygiene, 39.1% had the problem of water shortages or contamination. Moreover, 21.8% had the problem of disease outbreak, and more than half (64.5%) of the participants had to encounter the problem of displacement of human settlements.

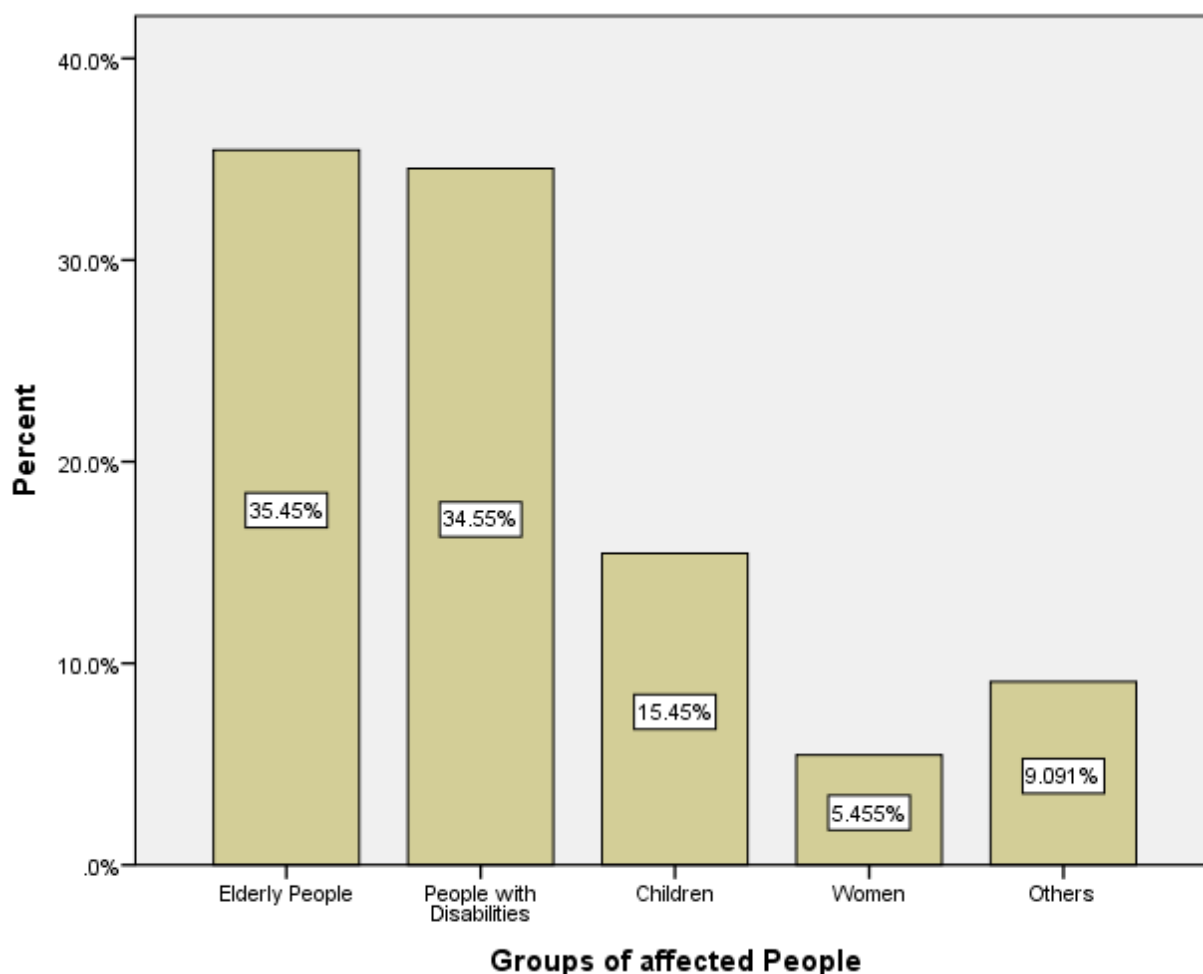


Figure 5: Opinion based on who is more affected

In the figure 4, opinion based on the population who is more affected in terms of respondents can be seen. Among the total participants (n=110), 35.45% and 34.55% said elderly people and

people with disabilities were more affected in the community when the natural disaster strikes while 15.45% said children were more affected based on their observation during the disaster. Moreover, 5.45% of the participants said women to be more affected which was the lowest among all and 9.091% said others.

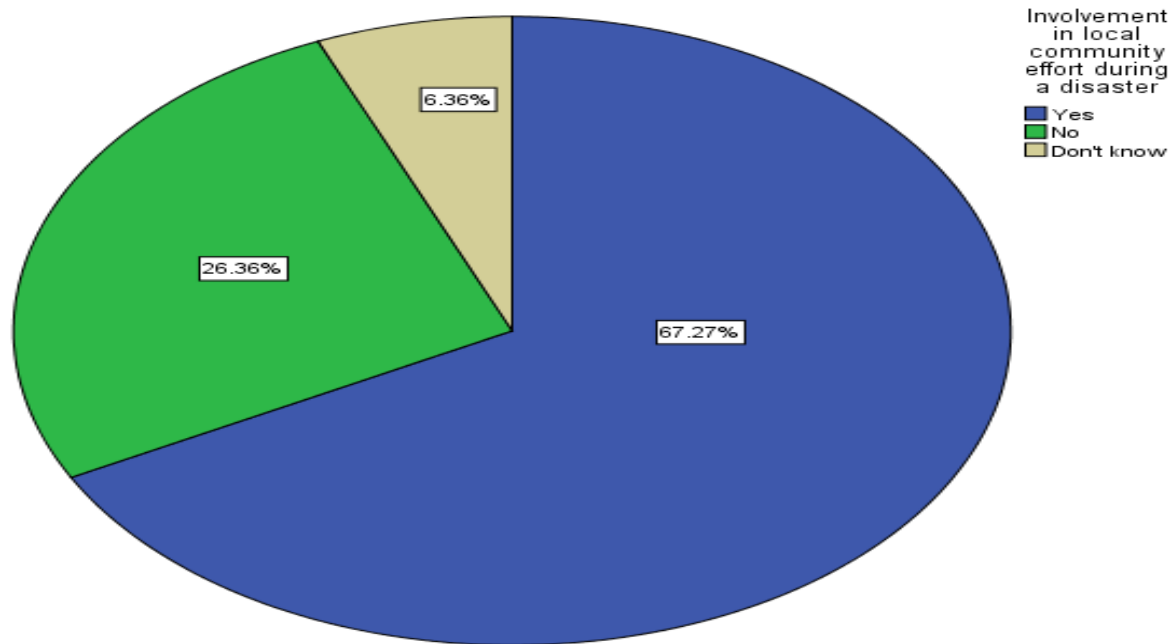


Figure 6: Status of the involvement during a disaster

The pie chart on figure 5 shows that more than half (67.27%) of the participants said they would involve in a local community effort during any disaster while 26.36% said they don't and 6.36% said they didn't know.

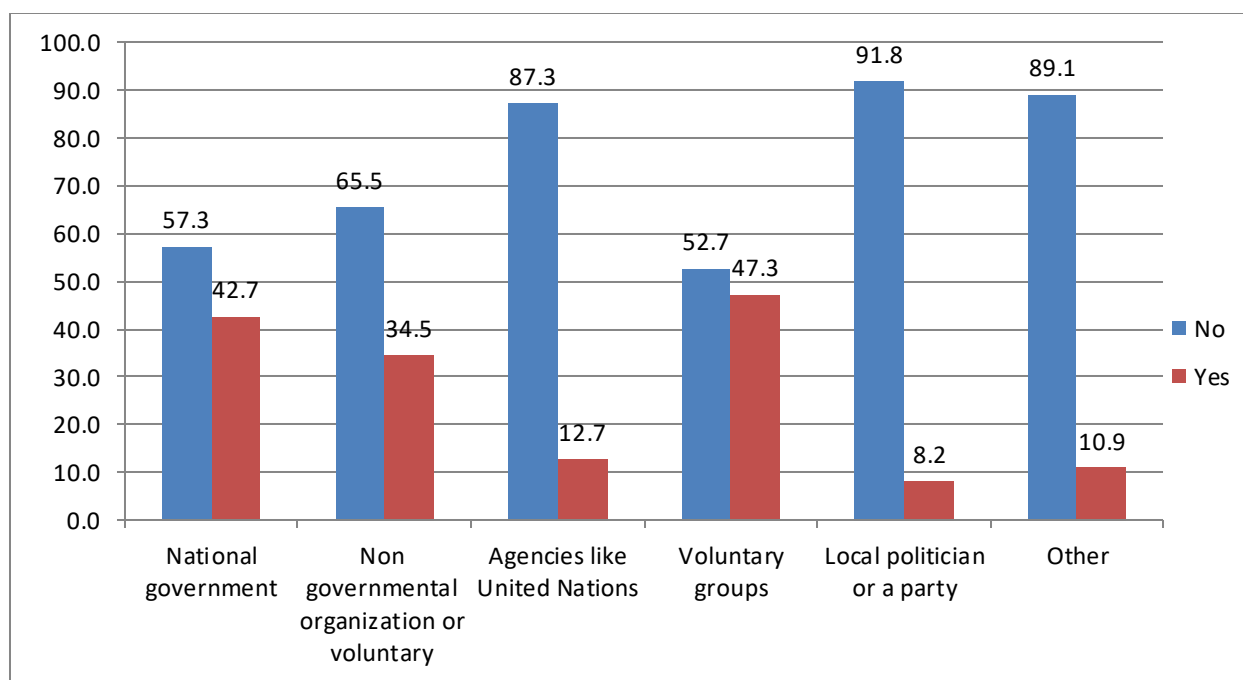


Figure 7: Status of help receive in community for preparing a disaster management plan

This diagram on the figure 6 illustrates that almost half 47.3% of participants had received help for preparing a disaster management plan in their community which was the highest among all followed by 42.7% who got help from the national government, 34.5% from the non-governmental organization or voluntary. Moreover, some (12.7%) got help from agencies like United Nations and 8.2% from the local politician or a party which was the lowest. There were 10.9% of participants who said they got help from others as well.

Awareness Level and Source of Information

Table 4: Awareness Status

Awareness status of Natural Hazard (in %)	Geophysical (Earthquakes, Landslides)	Hydrological (Flood, Avalanches)	Climatological (Extreme temperature, Drought, Wildfires)	Metrological (Cyclones, Waves)	Biological (Disease epidemics, insect/animal plagues)
Very much Aware	44.5	17.3	16.4	8.2	33.6
Much Aware	26.4	24.5	30.0	7.3	29.1
Aware	19.1	23.6	32.7	30.0	20.0
Slightly Aware	6.4	28.2	12.7	20.0	10.0
Not aware	3.6	6.4	8.2	34.5	7.3

The table 4 demonstrates the awareness status of disaster among the total participants. In terms of Geophysical type of disasters such as earthquakes and landslides, a majority (44.5%) were very much aware of which was the highest and (3.6%) of the participants were not aware which was the lowest among all. About Hydrological hazards like Flood and Avalanches, the highest (28.2%) number of participants were slightly aware followed by much aware (24.5%) and aware (23.6%) with 6.4% were not even aware being the lowest. Moreover, in the climatological type of disaster such as extreme temperature, drought, and wildfires, the highest (32.7%) number of participants were aware followed by 30% being much aware. Similarly, 30% of participants were aware and 20% were slightly aware of the metrological type of disasters such as cyclones and waves and in terms of a biological disaster such as disease epidemics, insect/animal plagues, 33.6% were very much aware which was the highest and the lowest(7.3%) of the participants were not aware.

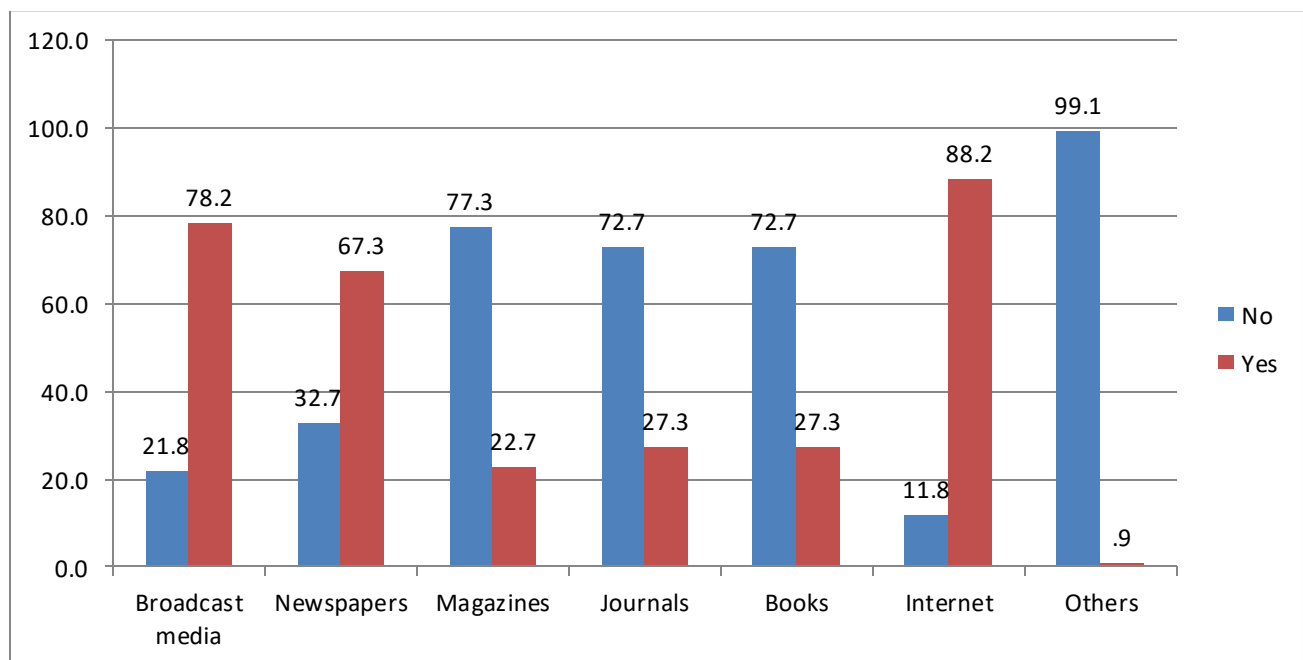


Figure 8: Source of Information

This bar diagram in the figure 7 illustrates that the majority (88.2%) of the participant's source of information for disaster was the internet. In addition, (78.2%) also used broadcast media, (67.3%) newspapers, (27.3%) Journals and (22.7%) used magazines as their source of information.

Table 5: Likelihood to access the information

Likelihood to access the information (%)	Broadcast media	Newspaper	Magazines	Journals	Books	Internet
Always	42.7	21.8	10.9	11.8	13.6	70.0
Very often	33.6	33.6	19.1	20.0	21.8	23.6
Sometimes	17.3	32.7	33.6	38.2	33.6	1.8
Rarely	5.5	10.9	26.4	20.0	20.0	3.6
Never	.9	.9	10.0	10.0	10.9	.9

The table 5 illustrates the likelihood to access the information. Among the various sources of information, the highest (42.7%) were always likely to access the information from broadcast media whereas (0.9%) had never used broadcast media as their source of information. About (33.6 %) of the participants were very often likely to access the information from the newspaper which was the highest and (0.9%) never used newspaper which was the lowest. Moreover, the highest (33.6%) of the participants sometimes used to access the information from magazines, (38.2%) from the journal and 33.6% from Books while (10%) had never used both magazines and journals and (10.9%) never used books. Similarly, (70%) Participants had always used the internet as their source of information about disaster risk reduction while (0.9%) never used the internet.

Table 6: Knowledge on the likelihood to get affected

Likelihood to get affect (%)	Earthquake	Landslides	Avalanches	Flood	Extreme Temperature	Wildfires
Definitely	63.6	10.0	3.6	13.6	17.3	10.0
Probably	20.0	15.5	6.4	20.0	22.7	14.5
Possibly	12.7	26.4	14.5	23.6	30.0	23.6
Probably not	2.7	24.5	28.2	17.3	21.8	25.5
Definitely not	.9	23.6	47.3	25.5	8.2	26.4

This table 6 demonstrates that the majority (63.6%) of the participants said that the area they live in would definitely be affected by earthquake while (26.4%) said it could be possibly affected by landslide along with (24.5%) saying probably not and (23.6 %) saying definitely not to be affected from landslides. Moreover, the highest (47.3%) number of participants said it was definitely not likely to get affected from avalanches at their places whereas in case of flood, (25.5%) of the participants said their area was definitely not likely to be affected from flood along with (23.6%) said it was possibly likely and 20% said probably to get affected from the flood. Likewise, the highest (30%) of the participants said they were possibly likely to get

affected from extreme temperature followed by (22.7%) said probably, (21.8%) said probably not, and (17.3%) said definitely to get affected from extreme temperature which indicates the variability in the likelihood of being affected from a natural disaster from the place of the area they live in. In addition, (26.5%) of the participants said it was definitely not likely to get affected by wildfire along with (25.5%) saying probably not while (23.6%) said it was possibly likely to be affected by wildfires in the place of the area they live.

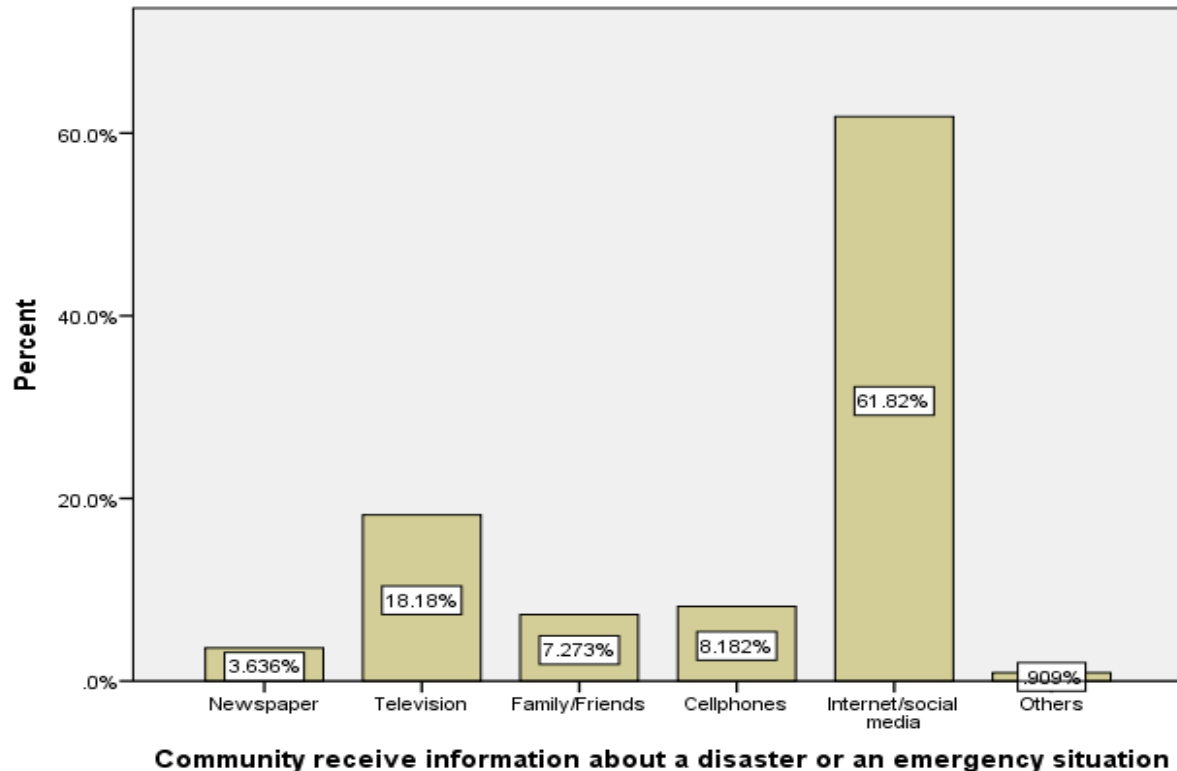


Figure 9: Status on how community receive information

From the figure 8, it can be illustrates that the majority (61.82%) of the participants said that their community receives information about a disaster or an emergency from the internet/ social media which was the highest followed by (18.8%) from television, (8.12%) from cell-phones, (7.27%) from family and friends and (3.63%) from the newspaper.

Legal Information

Table 7: Status on the information about disaster plan of government

Status	Frequency	Percent	Cumulative Percent
Yes	42	38.2	38.2
No	30	27.3	65.5
Don't Know	38	34.5	100.0

Total	110	100.0	
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The table 7 demonstrate that (38.2%) said that their government had a disaster plan whereas (27.3%) said their government didn't have a disaster plan and (34.5%) of the participants said they didn't know.

Table 8: Status on the government information about disaster preparedness and response

Status	Frequency	Percent	Cumulative Percent
Yes	59	53.6	53.6
No	51	46.4	100.0
Total	110	100.0	

The table 8 illustrates among the total participants (n=110) that more than half (53.6%) knew that national authorities produce information of disaster preparedness and response while (46.4%) of the participants didn't know.

Table 9: Status of the respondents who uses the government published materials

Status	Frequency	Percent	Cumulative Percent
Never	6	10.2	10.2
Rarely	14	23.7	33.9
Sometimes	33	55.9	89.9
Regularly	6	10.2	100.0
Total	59	100.0	

The table 9 illustrates that, among the participants (n=59) who knew that national authority produces disaster preparedness and response, more than half (55.9%) of the participants said they had used the materials sometimes followed by (23.7%) said they had rarely used the materials while (10.2%) said they had used the materials either regularly or never.

Relief, Response, Mitigation and Preparedness

Table 10: Descriptive Statistics of Relief Plan

Relief (in %)	I have minimum of 72 hours of water/food supply	I have mode of communication which is not dependent on electricity	I have First aid kits and other emergency kit	I have necessary hygiene and sanitation products	I have disaster kits and necessary medication	I have supplies for children, elderly people and people with difficulties	I have an emergency operation plan	I have an knowledge about an evacuation Area
Strongly Disagree	13.6	11.8	10.0	6.4	10.0	9.1	7.3	9.1
Disagree	10.0	21.8	11.8	11.8	27.3	22.7	35.5	19.1
Agree	40.9	37.3	52.7	44.5	41.8	40.0	36.4	38.2
Strongly Agree	29.1	20.0	20.0	31.8	13.6	20.9	13.6	21.8
I do not know	6.4	9.1	5.5	5.5	7.3	7.3	7.3	11.8

The table 10, it illustrates that among all participants (n=110), the highest number of participants agreed with all the statement of relief i.e. (40.9%) agreed on having the minimum of 72 hours of water/food supply, (37.3%) agreed on having mode of communication which was not dependent on electricity, (52.7%) on having first aid kits and other emergency kits, (44.5%) on having necessary hygiene and sanitation products, (41.8%) having disaster kits and necessary medications, (40%) having supplies for children, elderly people and people with difficulties, (36.4%) on having an emergency operation plan and (38.2%) having knowledge about an evacuation on the area.

Table 11: Descriptive Statistics of Response Plan

Response (in %)	I have knowledge about which government office needs to be contacted after the disaster	I have knowledge about evacuation process during disaster occurrence	I have knowledge about civil defense phone and officials numbers of disaster management in the community	I have knowledge about Cardiopulmonary resuscitation (CPR) and first aids during disaster management in the faculty	I have knowledge about how the injured individuals transferred to the health facility	I have knowledge about safety precautions	I have knowledge about safe waste disposal system	I have knowledge on the community laws or policies for disaster management?
Strongly Disagree	14	5.5	12.7	8.2	7.3	5.5	7.3	7.3
Disagree	12	18.2	19.1	20.9	15.5	9.1	8.2	24.5
Agree	52	49.1	40.0	36.4	46.4	48.2	50.9	38.2
Strongly Agree	19	14.5	17.3	18.2	22.7	30.9	28.2	19.1
I do not know	13	12.7	10.9	16.4	8.2	6.4	5.5	10.9

The table 11 shows that the highest number of participants agreed on all the statements related to a response where more than half (52%) of the participants agreed on having knowledge about which government office needs to be get in touch with after the disaster, almost half(49.1%) agreed on knowing evacuation process during disaster occurrence, (36.4%)agreed to have knowledge about civil defense phone and officials numbers of disaster management in the community, (46.4%) agreed to know Cardiopulmonary resuscitation (CPR) and first aids during disaster management in the faculty. In addition, almost half (48.2%) also agreed to know safety precautions, and a half (50.9%) of the participants agreed to know safe waste disposal system and (38.2%) agreed to know the community laws or policies for disaster management.

Table 12: Descriptive Statistics of Mitigation Plan

Mitigation (in %)	I have planned for insur ance	I have knowled ge about preventi ve health care	I have participat ed in disaster risk education training or workshop	I am confident for reconstructi on activities from government after disaster	I know the importan ce of talking about disasters with neighbor s, friends and colleague s	I give priority to disaster awarene ss in local, regional and national level	I used to listen experts or DRR leaders who work or do activities for disaster managemen t	I have knowled ge about disaster prone area
Strongly Disagree	9.1	7.3	10.0	14.5	7.3	6.4	7.3	8.2
Disagree	24.5	8.2	38.2	25.5	10.9	7.3	11.8	18.2
Agree	42.7	53.6	32.7	40.9	49.1	53.6	54.5	48.2
Strongly Agree	10.0	24.5	12.7	10.0	29.1	25.5	19.1	14.5
I do not know	13.6	6.4	6.4	9.1	3.6	7.3	7.3	10.9

The table 12 illustrates regarding the plan to mitigate the risk of disaster, 42.7% of the total participants (n=110) agreed to have planned for insurance which was the highest. Similarly, more than half (53.6%) have also agreed to know preventive health care practices whereas the highest (38.2%) of the participants disagreed to have participated in disaster risk training or workshop. In addition, 40.9% agreed that they are confident for reconstruction activities from the government after the disaster which is the highest. Almost half (49.1%) and (48.2%) also agreed on knowing the importance of talking about disasters with neighbors, friends, and colleagues, and know disaster-prone areas respectively. Moreover, more than half (53.6%) and (54.5%) agreed to give priority to disaster awareness at the local, regional and national level and to listen to experts or Disaster Risk Reduction leaders who work or do activities for disaster management respectively.

Table 13: Descriptive Statistics of Preparedness Plan

Preparedness (in %)	I have collected the information	I have spoken to disaster management representatives in my area	I have prepared a family emergency plan	I have prepared a neighborhood emergency plan	I have prepared disaster survival kits	I have taken special training	I have trained other members in the community	I have signed up with entities that provide emergency news or alert systems
Strongly Disagree	6.4	15.5	11.8	12.7	11.8	18.2	20.9	12.7
Disagree	28.2	39.1	24.5	35.5	33.6	38.2	41.8	40.0
Agree	47.3	22.7	43.6	30.0	39.1	28.2	20.0	29.1
Strongly Agree	8.2	10.9	13.6	12.7	8.2	7.3	9.1	8.2
I do not know	10.0	11.8	6.4	9.1	7.3	8.2	8.2	10.0

The table 13 illustrates that among the total participants (n=110), the highest (47.3%) number of participants agreed to have collected the information regarding the preparedness of any disaster that might occur whereas the majority (39.1%) disagreed to have spoken to disaster management representatives in their area. Moreover, (43.6%) agreed to have prepared their family emergency plan for any disaster that may occur. The highest (35.5%) and (38.2%) of the participants disagreed to have a neighborhood emergency plan and taken special training respectively while the majority (39.1%) agreed to have prepared disaster survival kits. In addition, 41.8% and 40.0% of the participants had disagreed to have trained other members in the community and have signed up with entities that provide emergency news or alert systems respectively.

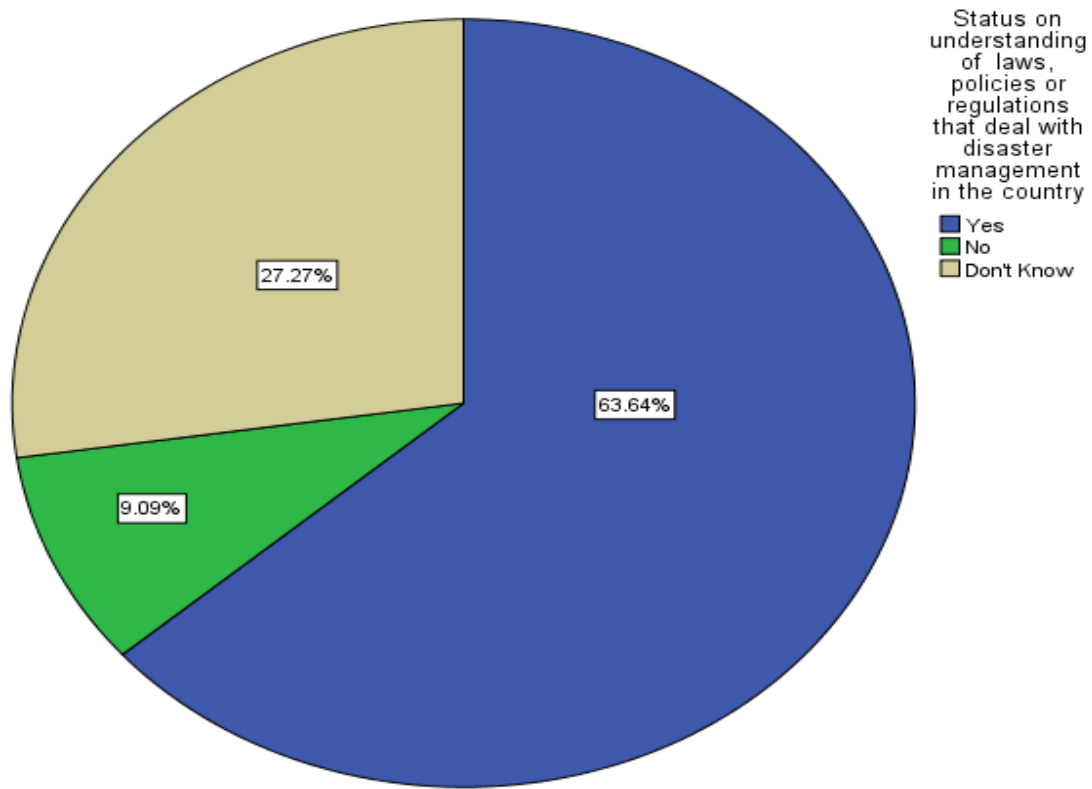


Figure 10: Status on understanding of laws, regulations that deals with disaster management

The figure 9 shows that among the total participants (n=110), the majority (63.64%) know that their country has laws, policies, or regulations that deal with disaster management while (9.09%) said that they don't have it while (27.27%) of the participants even don't know.

Table 14: Distribution on the understanding laws, policies or regulation with opinion on involvement to disaster preparedness

Status of understanding laws, policies or regulations that deal with disaster management in the country * Opinion on who should be involved in planning the next steps to improve disaster preparedness and reduce health risks Crosstabulation						
		Opinion on who should be involved in planning the next steps to improve disaster preparedness and reduce health risks				Total
		Community members	Community leaders	Local or national authorities	Specialized NGOs	
Status of understanding laws, policies or regulations that deal with disaster management in the country	Yes (%)	32 (45.7)	6(8.6)	32(45.7)	0(0)	70(100)
	Total (%)	32 (45.7)	6(8.6)	32(45.7)	0(0)	70(100)

The table 14 shows association national laws, policies or regulation with disaster preparedness. Among the participants who said they know about the laws, policies, or regulations that deal with disaster management (n=70), Community members and specialized NGO's should be included in preparing the next steps to improve disaster preparedness and reduce health risks, according to 32(45.7%) participants, and community leaders should be involved in it, according to 6 (8.6%).

Association between Age, Gender and Awareness level of the respondents

Table 15: Distribution among Age, Gender and Geophysical

Age group * Geophysical (Earthquakes, Landslides) * Gender Crosstabulation									
Gender				Geophysical (Earthquakes, Landslides)					Total
				Very much Aware	Much Aware	Aware	Slightly Aware	Not aware	
Male	Age group	18-23	Count (%Age group)	5(50)	5(50)	0(0)	0(0)	0(0)	10(100)
		24-29	Count (%Age group)	12(46.2)	9(34.6)	3(11.5)	1(3.8)	1(3.8)	26(100)
		30-35	Count (%Age group)	4(44.4)	2(22.2)	2(22.2)	1(11.1)	0(0)	9(100)
		36-40	Count (%Age group)	2(20)	4(40)	4(40)	0(0)	0(0)	10(100)
	Total		Count (%Age group)	23(41.8)	20(36.4)	9(16.4)	2(3.6)	1(1.8)	55(100)
Female	Age group	18-23	Count (%Age group)	13(46.4)	4(14.3)	7(25)	2(7.1)	2(7.1)	28(100)
		24-29	Count (%Age group)	12(48)	5(20)	5(20)	2(8)	1(4)	25(100)
		30-35	Count (%Age group)	1(50)	0(0)	0(0)	1(50)	0(0)	2(100)
	Total		Count (%Age group)	26(47.3)	9(16.4)	12(21.8)	5(9.1)	3(5.5)	55(100)
Total	Age group	18-23	Count (%Age group)	18(47.4)	9(23.7)	7(18.4)	2(5.3)	2(5.3)	38(100)
		24-29	Count (%Age group)	24(47.1)	14(27.5)	8(15.7)	3(5.9)	2(3.9)	51(100)
		30-35	Count (%Age group)	5(45.5)	2(18.2)	2(18.2)	2(18.2)	0(0)	11(100)
		36-40	Count (%Age group)	2(20)	4(40)	4(40)	0(0)	0(0)	10(100)
	Total		Count (%Age group)	49(44.5)	29(26.4)	21(19.1)	7(6.4)	4(3.6)	110(100)

The table 15 shows relationship of Age, Gender with Geophysical. Among the total male participants (n=55), 50% of those belonging to the 18-23 years age group said that they were very much aware and the rest 50% were much aware of geophysical (Earthquakes, landslides) disasters. In addition, the highest (46.4%) of the total male participants in the 24-29 age group were also very much aware of geophysical (earthquake, landslide) disasters. In the 30-35 age groups, the highest (44.4%) were very much aware while in the 36-40 age group each of the 40% was much aware and aware. Among the total female participants (n=55), the highest (46.4%) of the participants belonging to the 18-23 age group, (48%) belonging to the 24-29 age group were very much aware of the geophysical (earthquake, landslides) disasters. Similarly, (50%) of the participants belong to the 30-35 age group were also very much aware while the rest 50% were slightly aware of the geophysical disaster.

Table 16: Distribution among Age, Gender and Hydrological

Age group * Hydrological (Flood, Avalanches) * Gender Crosstabulation									
Gender				Hydrological (Flood, Avalanches)					Total
				Very much Aware	Much Aware	Aware	Slightly Aware	Not aware	
Male	Age group	18-23	Count (%Age group)	1(10)	3(30)	5(50)	1(10)	0(0)	10(100)
		24-29	Count (%Age group)	5(19.2)	8(30.8)	5(19.2)	5(19.2)	3(11.5)	26(100)
		30-35	Count (%Age group)	1(11.1)	3(33.3)	3(33.3)	2(22.2)	0(0)	9(100)
		36-40	Count (%Age group)	2(20)	3(30)	3(30)	2(20)	0(0)	10(100)
	Total		Count (%Age group)	9(16.4)	17(30.9)	16(29.1)	10(18.2)	3(5.5)	55(100)
Female	Age group	18-23	Count (%Age group)	4(14.3)	4(14.3)	6(21.4)	12(42.9)	2(7.1)	28(100)
		24-29	Count (%Age group)	5(20)	6(24)	4(16)	9(36)	1(4)	25(100)
		30-35	Count (%Age group)	1(50)	0(0)	0(0)	0(0)	1(50)	2(100)
	Total		Count (%Age group)	10(18.2)	10(18.2)	10(18.2)	21(38.2)	4(7.3)	55(100)
Total	Age group	18-23	Count (%Age group)	5(13.2)	7(18.4)	11(28.9)	13(34.2)	2(5.3)	38(100)

		24-29	Count (%Age group)	10(19.6)	14(27.5)	9(17.6)	14(27.5)	4(7.8)	51(100)
		30-35	Count (%Age group)	2(18.2)	3(27.3)	3(27.3)	2(18.2)	1(9.1)	11(100)
		36-40	Count (%Age group)	2(20)	3(30)	3(30)	2(20)	0(0)	10(100)
	Total		Count (%Age group)	19(17.3)	27(24.5)	26(23.6)	31(28.2)	7(6.4)	110(100)

The table 16 illustrates that out of 55 male participants, the highest (50%) of the participants belonging to the 18-23 age group were aware of hydrological(Flood, Avalanches) disaster while the highest (30.8%) of participants belonging to 24-29 age group were much aware. Moreover, (33.3%) of the male participants belonging to the 30-35 age group were both much aware and aware of hydrological (Flood, Avalanches) disasters, and (30.0%) of male participants of 36-40 age group were also much aware and aware. Similarly, out of 55 female participants, the highest (42.9%) and (36%) of participants belonging to the 18-23 age group and 24-29 age group were slightly aware of hydrological disasters respectively. Among the 30-35age group of female participants, 50% were much aware while the rest 50% were not aware of the hydrological disasters.

Table 17: Distribution among Age, Gender and Climatological

Age group * Climatological (Extreme temperature, Drought, Wildfires) * Gender Crosstabulation									
Gender				Climatological (Extreme temperature, Drought, Wildfires)					Total
				Very much Aware	Much Aware	Aware	Slightly Aware	Not aware	
Male	Age group	18-23	Count (%Age group)	1(10)	2(20)	4(40)	1(10)	2(20)	10(100)
		24-29	Count (%Age group)	5(19.2)	6(23.1)	10(38.5)	4(15.4)	1(3.8)	26(100)
		30-35	Count (%Age group)	1(11.1)	5(55.6)	2(22.2)	0(0)	1(11.1)	9(100)
		36-40	Count (%Age group)	2(20)	3(30)	3(30)	0(0)	2(20)	10(100)
	Total		Count (%Age group)	9(16.4)	16(29.1)	19(34.5)	5(9.1)	6(10.9)	55(100)
Female	Age group	18-23	Count (%Age group)	6(21.4)	9(32.1)	9(32.1)	3(10.7)	1(3.6)	28(100)

		24-29	Count (%Age group)	2(8)	8(32)	8(32)	6(24)	1(4)	25(100)
		30-35	Count (%Age group)	1(50)	0(0)	0(0)	0(0)	1(50)	2(100)
	Total		Count (%Age group)	9(16.4)	17(30.9)	17(30.9)	9(16.4)	3(5.5)	55(100)
Total	Age group	18-23	Count (%Age group)	7(18.4)	11(28.9)	13(34.2)	4(10.5)	3(7.9)	38(100)
		24-29	Count (%Age group)	7(13.7)	14(27.5)	18(35.3)	10(19.6)	2(3.9)	51(100)
		30-35	Count (%Age group)	2(18.2)	5(45.5)	2(18.2)	0(0)	2(18.2)	11(100)
		36-40	Count (%Age group)	2(20)	3(30)	3(30)	0(0)	2(20)	10(100)
	Total		Count (%Age group)	18(16.4)	33(30)	36(32.7)	14(12.7)	9(8.2)	110(100)

The table 17 illustrates that among the male participants (n=55), the majority (40%) of the participants of 18-23 age group and (38.5%) of the participants of 24-29 age group were aware of the Climatological (Extreme temperature, Drought, Wildfires). In addition, the highest (55.6%) of the male participants belonging to the 30-35 age group were much aware while 30% of each participants belonging to the 36-40 age group were both much aware and aware about the climatological (Extreme temperature, Drought, Wildfires). Likewise, among the female participants(n=55), the highest (32.1%) each of the participants belonging to the 18-23 age group were much aware and aware. Moreover, (32%) each of the participants belonging to 24-29 age group were also much aware and aware and (50%) of the female participants belonging to 30-35 age group was very much aware and rest (50%) was not aware of this disaster.

Table 18: Distribution among Age, Gender and Metrological

Age group * Metrological (Cyclones, Waves) * Gender Crosstabulation									
Gender				Metrological (Cyclones, Waves)					Total
				Very much Aware	Much Aware	Aware	Slightly Aware	Not aware	
Male	Age group	18-23	Count (%Age group)	1(10)	1(10)	3(30)	0(0)	5(50)	10(100)
		24-29	Count (%Age group)	2(7.7)	0(0)	4(15.4)	9(34.6)	11(42.3)	26(100)

		30-35	Count (%Age group)	1(11.1)	2(22.2)	2(22.2)	2(22.2)	2(22.2)	9(100)
		36-40	Count (%Age group)	1(10)	3(30)	3(30)	1(10)	2(20)	10(100)
	Total		Count (%Age group)	5(9.1)	6(10.9)	12(21.8)	12(21.8)	20(36.4)	55(100)
Female	Age group	18-23	Count (%Age group)	4(14.3)	2(7.1)	9(32.1)	7(25)	6(21.4)	28(100)
		24-29	Count (%Age group)	0(0)	0(0)	12(48)	3(12)	10(40)	25(100)
		30-35	Count (%Age group)	0(0)	0(0)	0(0)	0(0)	2(100)	2(100)
	Total		Count (%Age group)	4(7.3)	2(3.6)	21(38.2)	10(18.2)	18(32.7)	55(100)
Total	Age group	18-23	Count (%Age group)	5(13.2)	3(7.9)	12(31.6)	7(18.4)	11(28.9)	38(100)
		24-29	Count (%Age group)	2(3.9)	0(0)	16(31.4)	12(23.5)	21(41.2)	51(100)
		30-35	Count (%Age group)	1(9.1)	2(18.2)	2(18.2)	2(18.2)	4(36.4)	11(100)
		36-40	Count (%Age group)	1(10)	3(30)	3(30)	1(10)	2(20)	10(100)
	Total		Count (%Age group)	9(8.2)	8(7.3)	33(30)	22(20)	38(34.5)	110(100)

In the table 18, out of the total male participants(n=55), the highest (50%) of the participants belonging to the 18-23 age group and 42.3% of the participants belonging to the 24-25 age group were not aware of Metrological (Cyclones, Waves) disaster. Among the 30-35 age group, the percentage of participants being much aware, aware, slightly aware, and not aware were same i.e.22.2% and in the 36-40 age group each 30% of the participants were much aware and aware about the metrological disaster. Likewise, out of total female participants (n=55), the highest (32.1%) of the participants belonging to the 18-23 age group and 48% of the participants belonging to 24-29 age group were aware of the meteorological disaster while all of the female participants belonging to 30-35 age group were not aware of it.

Table 19: Distribution among Age, Gender and Biological

Age group * Biological (Disease epidemics, insect/animal plagues) * Gender Crosstabulation									
Gender				Biological (Disease epidemics, insect/animal plagues)					Total
				Very much Aware	Much Aware	Aware	Slightly Aware	Not aware	
Male	Age group	18-23	Count (%Age group)	3(30)	2(20)	3(30)	0(0)	2(20)	10(100)
		24-29	Count (%Age group)	9(34.6)	6(23.1)	5(19.2)	4(15.4)	2(7.7)	26(100)
		30-35	Count (%Age group)	2(22.2)	2(22.2)	4(44.4)	1(11.1)	0	9
			Count (%Age group)	22.2%	22.2%	44.4%	11.1%	0.0%	100.0%
		36-40	Count (%Age group)	2	6	1	0	1	10
			Count (%Age group)	20.0%	60.0%	10.0%	0.0%	10.0%	100.0%
	Total		Count (%Age group)	16	16	13	5	5	55
			Count (%Age group)	29.1%	29.1%	23.6%	9.1%	9.1%	100.0%
	Female	Age group	18-23	Count (%Age group)	14(50)	6(21.4)	3(10.7)	4(14.3)	1(3.6)
24-29			Count (%Age group)	6(24)	10(40)	6(24)	2(8)	1(4)	25(100)
30-35			Count (%Age group)	1(50)	0(0)	0(0)	0(0)	1(50)	2(100)
Total		Count (%Age group)	21(38.2)	16(29.1)	9(16.4)	6(10.9)	3(5.5)	55(100)	
Total		Age group	18-23	Count (%Age group)	17(44.7)	8(21.1)	6(15.8)	4(10.5)	3(7.9)
	24-29		Count (%Age group)	15(29.4)	16(31.4)	11(21.6)	6(11.8)	3(5.9)	51(100)
	30-35		Count (%Age group)	3(27.3)	2(18.2)	4(36.4)	1(9.1)	1(9.1)	11(100)

The table 20 illustrates the relationship between the education status of participants their awareness of geophysical (earthquake, landslides) disaster. Among the total participants (n=110), the highest (42.4%) of the participants who had completed their bachelor's degree, 47.5% of the participants who had completed their master's degree, and 50% of the participants who have completed their Ph.D., Post-doc were very much aware of geophysical disasters.

A chi-square test was done and 0.992 (p-value) greater than 0.05 (alpha value) was obtained which shows there is no association between the education level of the participants and awareness of geophysical disaster.

Table 21: Distribution among Education Status and Hydrological

Education Status * Hydrological (Flood, Avalanches) Crosstabulation										
			Hydrological (Flood, Avalanches)					Total	Chi-squar e Test	P- value
			Very much Aware	Much Aware	Aware	Slightly Aware	Not awar e			
Education n Status	Bachelor' s Degree	Count(% within Educatio n Status)	8(12.1)	15(22.7)	18(27.3)	21(31.8)	4(6.1)	66(100)	6.619	0.578
	Master's Degree	Count(% within Educatio n Status)	10(25)	10(25)	7(17.5)	10(25)	3(7.5)	40(100)		
	PhD, Post-doc	Count(% within Educatio n Status)	1(25)	2(50)	1(25)	0(0)	0(0)	4(100)		
	Total		Count(% within Educatio n Status)	19(17.3)	27(24.5)	26(23.6)	31(28.2)	7(6.4)		
Alpha Value= 0.05										

The table 21 demonstrates the relationship between the education status of the participants and their awareness of the hydrological (Flood, Avalanches) type of disaster. Out of total participants (n=110), the highest (27.3%) of the participants among those who have completed their Bachelor's degree were slightly aware of the hydrological type of disaster and each of 25% of the participants who have completed their Master's degree were very much aware, much aware and slightly aware. In addition, half (50%) of the participants who have completed their Ph.D., Post-doc were much aware.

In this, a chi-square test was done with the result of 0.578 (p-value) is greater than alpha value (0.05) which signifies that the relationship between education status and the awareness of the hydrological disaster was not statistically significant.

Table 22: Distribution among Education Status and Climatological

Education Status * Climatological (Extreme temperature, Drought, Wildfires) Crosstabulation										
			Climatological (Extreme temperature, Drought, Wildfires)					Total	Chi-squar e Test	P- value
			Very much Aware	Much Aware	Aware	Slightly Aware	Not aware			
Education n Status	Bachelor's Degree	Count(% within Educatio n Status)	9(13.6)	19(28.8)	26(39.4)	8(12.1)	4(6.1)	66(100)	5.911	0.657
	Master's Degree	Count(% within Educatio n Status)	8(20)	12(30)	9(22.5)	6(15)	5(12.5)	40(100)		
	PhD, Post-doc	Count(% within Educatio n Status)	1(25)	2(50)	1(25)	0(0)	0(0)	4(100)		
	Total		Count(% within Educatio n Status)	18(16.4)	33(30)	36(32.7)	14(12.7)	9(8.2)		
Alpha Value= 0.05										

The given table 22 illustrates the relationship between the education status of participants their awareness of Climatological (Extreme temperature, Drought, Wildfires) disaster. Among the total participants (n=110), the highest (39.4%) of the participants who have completed their Bachelor's degree were aware of climatological disaster while among the participants who have completed their Master's degree and those who have completed their Ph.D., Post-doc, the highest (30%) and (50%) of the participants were much aware respectively.

In this, a chi-square test was done with the result of 0.657 (p-value) is greater than alpha value (0.05) which signifies that the relationship between education status and the awareness of the climatological disaster was not statistically significant.

Table 23: Distribution among Education Status and Metrological

Education Status * Metrological (Cyclones, Waves) Crosstabulation										
			Metrological (Cyclones, Waves)					Total	Chi-square Test	P-value
			Very much Aware	Much Aware	Aware	Slightly Aware	Not aware			
Education Status	Bachelor's Degree	Count(% within Education Status)	6(9.1)	3(4.5)	23(34.8)	17(25.8)	17(25.8)	66(100)	37.514	0.001

	Master's Degree	Count(% within Education Status)	3(7.5)	2(5)	9(22.5)	5(12.5)	21(52.5)	40(100)		
	PhD, Post-doc	Count(% within Education Status)	0(0)	3(75)	1(25)	0(0)	0(0)	4(100)		
Total		Count(% within Education Status)	9(8.2)	8(7.3)	33(30)	22(20)	38(34.5)	110(100)		
Alpha Value= 0.05										

In the given table 23 it shows the relationship between the education status of participants and their awareness level on the meteorological (cyclones, waves) type of disaster. In this study, out of total participants (n=110), the highest (34.8%) of the participants who have completed their bachelor's degree were aware of the meteorological disaster while more than half (52.5%) of the participants who have completed their masters-level were not aware of this disaster. Moreover, among the participants who have completed their Ph.D., Post-doc, 75% of the participants were much aware of the meteorological type of disaster.

On the other hand, the chi-square value (p-value) is found to be 0.001 at 0.05 significance level (alpha value). Thus, the null hypothesis can be rejecting and alternative hypothesis is to be accepted. Thus, there is an association between Education level and Metrological.

Table 24: Distribution among Education status and Biological

Education Status * Biological (Disease epidemics, insect/animal plagues) Crosstabulation										
			Biological (Disease epidemics, insect/animal plagues)					Total	Chi-square Test	p-value
			Very much Aware	Much Aware	Aware	Slightly Aware	Not aware			
Education Status	Bachelor's Degree	Count(% within Education Status)	21(31.8)	18(27.3)	16(24.2)	6(9.1)	5(7.6)	66(100)	1.565	0.992
	Master's Degree	Count(% within Education Status)	15(37.5)	11(27.5)	6(15)	5(12.5)	3(7.5)	40(100)		
	PhD, Post-doc	Count(% within Education Status)	1(25)	3(75)	0(0)	0(0)	0(0)	4(100)		

Total	Count(% within Education Status)	37(33.6)	32(29.1)	22(20)	11(10)	8(7.3)	110(100)		
Alpha Value= 0.05									

The given table 24 illustrates the relationship between the education status of participants their awareness of Biological (Disease epidemic, insect/animal plagues) type of disaster. Among the total participants (n=110), the highest (31.8%) and (37.5%) of the participants who have completed their Bachelor's degree and master's degree were very much aware of the biological type of disaster respectively while among the participants who have completed their Ph.D., Post-doc, the highest (75%) of the participants were much aware of it.

In this, a chi-square test was done with the result of 0.992 (p-value) greater than 0.05 (alpha value) which signifies that the relationship between education status and the awareness of the biological disaster was not statistically significant.

Level of Awareness and Source of Information

Table 25: Distribution among level of awareness (Geophysical) and source of information (Internet)

Crosstab										
			Geophysical (Earthquakes, Landslides)					Total	Chi-square Test	P-value
			Very much Aware	Much Aware	Aware	Slightly Aware	Not aware			
Sources of Information	No	Count(% within Sources of Information -Internet)	5(38.5)	1(7.7)	4(30.8)	3(23.1)	0(0)	13(100)	10.132	0.038
	Yes	Count(% within Sources of Information -Internet)	44(45.4)	28(28.9)	17(17.5)	4(4.1)	4(4.1)	97(100)		
Total		Count(% within Sources of Information -Internet)	49(44.5)	29(26.4)	21(19.1)	7(6.4)	4(3.6)	110(100)		
Alpha Value= 0.05										

In the table 25, the distribution among level of awareness (Geophysical) and source of information (Internet) is being shown. Among 97 respondents who access internet for a source of information, have found to be 'very much aware' about geophysical forms of natural disaster that

is 45.4% of the total. Likewise, 28.9% is second highest in much aware and 17.5% as third highest in aware. Only 4.1% has stated they are slightly aware and not aware.

On the other hand, the chi-square value (p-value) is found to be 0.038 at 0.05 significance level (alpha value). Thus, the null hypothesis is rejected and alternative hypothesis is been accepted. Thus, there is relationship between Source of information (Internet) and Awareness Level (Geophysical).

Discussion

The Himalayas of Nepal is regarded as world's most serious flood hazard areas. Rainfall intensity, excessive wet, and the slope of watersheds and river courses all influence flood magnitudes. The Hilly region, landslides are widespread, and floods and fires are common in the Terai. As a result, natural disasters including floods, landslides, and forest fires are common in Nepal. The above hazards strike almost every year claiming many lives and wreaking havoc on property.⁴ The need for systematic information (knowledge management) is crucial for preparedness and also from the perspective of the decision making.

Government estimates different form of hazards like floods, landslides, fires, avalanches, and epidemics have killed many inhabitants and destroyed property worth millions of dollars over the last 30 years. Perhaps, have a depressing effect on conducting developmental agenda of the nation. Aside from the above reasons, catastrophe losses are increasing due to a lack of effective disaster management plans, regulations, and preparedness and risk mitigation programs. Because they are confined to rapid catastrophe response, existing disaster regulations do not cover all elements of disasters. As a result, catastrophe reaction and relief are prioritized over holistic measures that involve planning, preparation, and recovery.⁵

DRR research and decision-making isn't just about "managing changes caused on by disasters," except also about "creating systemic changes" that make inhabitants less deprived to calamities(12). Thus, chapter explains about the discussion aspect of the major findings of the study. The section explores the information from the identified variables.

Past Experience

According to a study on the impact of disaster on the elderly, patterns of exposure exist in the sociological, cognitive, and physiological dimensions and are risky. There are three major responds strategy being suggested in order to reduce the vulnerability such as targeting, connection, and modification. The same study suggest that families, neighborhood association, religious bodies, philanthropic organizations, corporations, service agencies, and local governments can all help to reduce a population's overall vulnerability by systematically improving the geriatric community's day-to-day and disaster preparedness.(13) The respondent

⁴ Khanal, N.R. (1998), "Water Induced Disaster in Nepal", A Paper Presented in an International Seminar on Water Induced Disaster held from 4 to 6 November, 1998 in Lalitpur, Nepal.

⁵ Poudyal Chhetri, M.B. and Bhattarai, D. (2001), "Mitigation and Management of Floods in Nepal," a book published by, GoN, Ministry of Home Affairs, Kathmandu, Nepal.

of this study have perceived that the elderly citizens are comparatively vulnerable (figure 4) than other group of people. More than 35.45% of the total respondents have claimed that they are vulnerable. On the other hand, the study conducted on the people with disabilities (pwd) or differently able people, it has been found that this segment of the population lacks the capabilities to cope with the disaster(14).

Displacement has significant and complex drivers now, and this will continue in the future(15).The study on the river bank erosion induced human displacement, has observed that displaced persons endure economic insecurity and unemployment consequent to the loss of productive lands. The victims also face social insecurity as a result of the denial of civic rights, as well as health insecurity resulting to be short of basic infrastructure. All of these insecurities resulting from forced displacement result in deprivation, poverty, fragility, and increased vulnerability for families(16).The devastating earthquake in 2015 alone cost \$7 billion in damages and displaced 2.6 million people(17).In the year's 2017 and2018, disasters affected a total of 27,256 families. In the disaster-affected areas, 4,434 dwellings were completely destroyed, while 16,308 were partially destroyed. It resulted in a totality loss of roughly 6.84 billion Nepalese rupees in terms of economic damage. **(The National Emergency Operation Center 2017-2018)**. Out of 110 respondents, more than half percentage (64.5%) has stated that they have faced the issues related to displacement of human settlement. Thus, it can be estimated that majority of the respondents have experienced issues related to shelter and settlement.

Education Level, Experience and Awareness

The past study on the educational institute and understanding of DRR has found that universities and higher educational institutions are in charge of doing sound knowledge-based research to resolve DRRM concerns that might be directly adopted by various levels of government in their plans, policies, and programs. Sustainable disaster management necessitates a greater degree of knowledge, skills, and capacities. However, many higher education academic curricula are still in the memorizing, comprehending, and recalling phases, missing the practical application in terms of analysis, research, and invention. The Higher educational institutions' disaster research and innovation in terms of involvement, cooperation, creativity, human and environmental centric methods were determined to be just satisfactory in Nepal. In additional to this, in the DRRM process the university and academics play a critical role in ameliorating knowledge on disaster preparedness, response, risk reduction, and mitigation. Thus, Universities, in particular, offer a unique potential to engage with society and contribute to the education of students, training services, knowledge development, and information transfer to communities(18). Despite understanding the importance of universities and academics in the drafting and executing of the DRR policies and plan, this study findings has critically state that the relationship between education and DRR awareness is not associated (table 20 to 24) in most form of hazards however to some calamities like Metrological (table 23), the education plays role on creating awareness.

The study further adds that, past experience to disaster also plays role on creating the awareness related to the disaster. A study conducted on the Thailand and Philippines have shown as effect of educations on an emergency management is meditating particularly in the social capital and

catastrophe risk perceptions, whereas in the Philippines, no facts of education being mediate through noticeable channel exists. Additional to this, when the interaction between education and hazard experience is taken into account, it is found that education increases disaster readiness only for HHs that are never touched by any hazards(19).

Therefore, this study strongly agrees with the findings of past study related to the awareness created by education and experience. Kathmandu valley (districts like: Kathmandu, Lalitpur and Bhaktapur) is highly prone to disaster like earthquake, landslides and floods this can be said experience has potential impact on the understanding of disaster. On the other hand, the disaster which is not yet happened on the valley like meteorological (cyclones, waves) type of disaster awareness is been created by education.

The stakeholders like National Government, Non-governmental organization or voluntary organization, UN Agencies, Voluntary groups and other organization working under disaster theme plays a significant responsibilities in ameliorating the awareness level and converting knowledge into the actions. The study has found that information is a public good; it must assume that facts can be made available, discovered, and useable by all market participants. A freely accessible market approach also allows for a solution to two points of dispute. Firstly, is to meet the demand for useful adequate information interchange from actors who were either not trained or not trained enough to directly acquire and apply the knowledge they required to properly deal with calamities. Secondly, is to communicate for encouraging public to keenly practice on their personal protection through useable knowledge co-production, as well as post-event experience archiving(20). Thus, it has been suggested from the study that the information needs to be accessible to public for better understanding of hazards and measures to prepare with disaster related issues. Hence, stakeholders can participate in and contribute to knowledge co-production aimed at increasing understanding and awareness of preventive and preparedness, and will thus be utilized to establish knowledge co-production systems. The findings of this study state that stakeholders like voluntary groups (47.3%), National Government (42.7%) and Non-governmental Organization (34.5%) have role on preparing a disaster management plan (figure 6), therefore these stakeholders should involve intensively on creating the participatory disaster management plan so that the local will be aware about every phase of disaster cycle.

Into the bargain, raising Disaster Risk Reduction responsiveness among communities is one of Nepal's most well-executed programs. Among the activities include educator trainings, hazard quiz contests, community centre activities on Disaster Risk Reduction capacity building, safety and welfare, and simulations. Another extensively used DRR approach in Nepal is instilling a feeling of prevention among communities. NGOs are active in generating hazard education materials, organizing DRR integration into nationwide education systems, and instruction disaster risk reduction issues to adolescents, leaders, and parents.

Source of Information and Awareness

In the past study, when participants were polled about their use of media as a means for calamity information, it was discovered that women prefer to learn about and receive calamity information from local channel (i.e. Nepal Television), men prefer to learn about and receive calamity

information from FM radios (7). Since, the study is been conducted in Kathmandu Valley the preference to radios is found to be null. Rather population were more found to be using Internet (more than 88% of the total respondents prefer) as major source of information and followed by Broadcast Media (like 78.2% of the total respondents) i.e. Television (as given in the figure 7).

In the event of a disaster, a combination of increased media communication and school instruction may help to increase risk perception and emergency cooperation behaviors. Schools and universities, in particular, must disseminate safety information and hazards news through different media, including college websites, in order to encourage emergency cooperation behaviors such as attending emergency skills training, participating in an emergency drill, or volunteering for emergency services. There required many documentaries related to hazards and its risk, and media companies should facilitate extensively to cover hazard and risk news via internet. However, because young people have an undeveloped mind and poor discrimination, the information for young people is frequently fragmented and occasionally incorrect, spreads over multiple channels, and causes misunderstanding and tiredness. To maximize its worth, concern institute should collect reliable information effectively, then adapt and actively promote the contents to young people based on their requirements(21).

Along with this, it has been identified that the community receives information from internet during the time of emergency (figure 8) which can be assumed that individuals who have experienced various sorts of disasters may affect differently by media coverage, resulting in person variances in emergency awareness and their actions and these information's are been disseminated to the community. Likewise, this has also been discussed on other study that the information received from the media (or exposure to media); the impact is larger for people who have had fewer disaster exposures in terms of risk assessment and humanitarian response. When it comes to bringing concerns to the public's attention, the media enjoys an unrivaled edge. On the one hand, the media can use this to raise awareness for creating individual safety issues, construct behavioral patterns. On the other hand, it can express the meaning of a secure home and in the community, the most critical safety competences, the capacity to produce protection, and a need to assist others in doing so. (21).

The use of social media has been shown to be quite beneficial because it has allowed obtaining constructive criticism and information through social media channels, which are growing in popularity. For instance, the MoHA's DRR portal has been critical in providing access to information and updates on DRM operations in Nepal. It serves as a repository for DRM legal systems, strategies, and action-plans, as well as response, preparedness and other Disaster Risk Management actions. It not only keeps track of before time alerts and updates, but also broadcasts information via social media. Therefore, the effective use of social media has allowed youths on accessing the information's about DRR. **(Annual report 2019)**. Besides this, if we see the association from the context of level of awareness (geophysical) and source of information (internet), it has been found that there is an association between these variables (table 25).

Government Intervention and Knowledge on Disaster

The study has suggested that, a more integrated, top-down and bottom-up system is essential to have included DRR into building processes, which should involve not only structural training but then also stakeholder responsiveness. In addition to this, some socio-demographic factors, such as rising age, lower education level, previous earthquake experience, and non-participation in DRR awareness/training programs, are also regarded as contributing to a lack of DRR awareness. Moreover, low literacy rates, a lack of public knowledge, and popular misconceptions (some individuals, particularly illiterate rural people, believe that natural calamities are caused by God) have been identified as imperative issues on DRR. They are rarely aware that tragedies can be mitigated by taking preventative actions.⁶

Nepal has also adopted the DRRM Act, 2017 in accordance with international commitments, as well as the 18 DRR National Strategic Plan of Action 2018 –2030 based on past disaster experiences and the Nepalese Constitution. All aspects of DRRM are addressed under the act. It established the "NDRM Authority" as a pioneer organization for disaster management and specified the roles and obligations of the federal, provincial, and local governments. With an approval of the DRR Strategic Plan of Action 2018-2030, Nepal's commitment to the Sendai Framework Disaster Risk Reduction (SFDRR) was localized in 2018. DRM initiatives at the global, national, and sub-national levels are strengthening and fostering cohesiveness in DRR policies and practices. The framework tackles knowledge-related issues and gives an opportunity to emphasize the importance of understanding in DRR. The SFDRR tackles key DRR concerns and places a greater emphasis on knowledge development and implementation than previous international frameworks and initiatives. It contains particularly useful recommendations for the generation and diffusion of information. While this is a positive step, the other step is to take forward to the "triple-loop" which will enhance on learn and transform to the present social production of threat information, shifting in focus away from risk information creation and toward co-produced hazard knowledge that will be acceptable and enforceable by a variety of consumers. More direction is required to improve processes and platforms for analyzing both current and freshly developed content.

The new act on DRR can be seen of as an umbrella statute that covers the entire spectrum of DRM, from pre and post hazard. It has implemented catastrophe risk reduction activities in accordance with the state's new reorganization. This act's institutional set-up has attempted to decentralize DRRM tasks such as preparedness, response, rescue, and relief to the provincial and district/local levels. Nonetheless, this Act has concentrated power over disaster-related policymaking in the hands of the National Council, with the provinces and district/local authorities acting as implementing agencies that may have a favorable impact on local capacity building and the establishment of functioning organs. In addition, local government entities are empowered to govern themselves under the LGOA, 2017, which replaced the LSGA, 1999. It recognizes that the most appropriate points of entry to satisfy the disaster management demands

⁶Chhetri MP. Disaster management in Nepal: Problems and solutions. Natural disaster management. Leicester: UK: Tudor Rose Holdings, Ltd. 1999.

at the local level are local people and local bodies. This Act has supported a proactive disaster preparedness and response (DRR) approach to disaster management. It will be an excellent chance to bring together key government agencies, non-government organizations, the commercial sector, and development partners to work on putting the New DRM Act's measures for disaster resilience into practice. The NAP for national disaster risk management addresses the pre-, during, and post-disaster periods of a disaster, is one of the most important policies on DRRM (MoHA, 1996). It has placed a strong emphasis on hazard assessment and mapping of reoccurring disasters like as earthquakes, floods, landslides, GLOF, and other natural disasters. The government programme mostly emphasis on the risk/vulnerability mapping and zoning, calamity networking and information system and community level preparedness.

It can be assumed from the findings of this study (figure 9) that the intervention of government on the disaster management and risk reduction, the awareness about disaster (Prevention/Mitigation and Preparedness in the pre-disaster stage, and Response and Rehabilitation/Reconstruction in post-disaster stage) has found to be more than 63.64% of total respondents, where remaining marked that they are not aware (27.7% and 9.09% stated they don't know and no respectively). As more than 30% of total respondents are lacking information on disaster legislation and government plan so it can be said they are lagging behind from direct benefits of government interventions. Thus, awareness to such group of people could be possible by use of informative techniques like Internet (figure 8) and bringing different stakeholders together such as Community members and local or national authorities which have crucial role according to the respondents (table 14).

In additional, information is a public good, it must be assumed that information resources can be made available, determine, and accessible by all market participants. The concept of an open access marketplace also allows for a response to two points of contention. Firstly, to keep up with the demand for useful information and consciousness to the exchange from stakeholder groups that were either not trained or not expert enough too directly access and use the knowledge they required to better deal with disasters. Secondly, to communicate with those in order to encourage people to enthusiastically add to their personal protection and hammering decline through useable knowledge co-production, as well as post-event experience archiving. Thus, it has been suggested from the study that the information needs to be accessible to public for better understanding of disaster and be prepared with disaster related issues. In additional to this stakeholders like National Government, Non-governmental organization or voluntary organization, UN Agencies, Voluntary groups and other organization working under disaster theme plays a significant responsibilities in ameliorating the knowledge and converting those knowledge into the actions. Hence, stakeholders should participate in and contribute to knowledge co-production aimed at increasing understanding and awareness of the need of preventive and preparedness, and will thus be utilized to establish knowledge co-production systems.

Chapter 5

Recommendation

Since the past experience also plays significant role on creating the awareness of the people, thus guiding them through authentic information by proper means of communication also plays crucial role in order to prevent from misleading the information. This research also suggests that incorporating DRR into construction practice requires a more holistic, centralized and decentralized strategies needs to be included not only for structural training but also stakeholder awareness.

In the event of a disaster, a combination of increased media communication and school instruction could help to increase risk perception and emergency cooperation behaviors. Schools and universities, in particular, must disseminate safety information and hazard news through different forms of medium, including college websites, in order to encourage crisis support people should attend crisis professional development, engaging in an emergency simulation, or volunteering for emergency responders are all examples of positive actions. More disaster-related films for young people should be produced and distributed, and media corporations must provide better adequate protection of catastrophic news via the internet.

This study suggest that the information needs to be accessible to public for better understanding of disaster and be prepared with disaster related issues and use of Internet for mean of communication is efficient and effective. In additional to this stakeholders like National Government, Non-governmental organization or voluntary organization, UN Agencies, Voluntary groups and other organization working under disaster theme plays a significant responsibilities in ameliorating the knowledge and converting those knowledge into the actions. Hence, knowledge holders can participate in and contribute to knowledge co-production aimed at comprehending and appreciating the need of prevention and readiness, and will thus be utilized to establish knowledge co-production systems.

In addition, the DRR actions from the Government plan are incomplete in implementing emergency rescue and relief efforts on a case-by-case basis, which is a major source of concern among disaster-affected populations and disaster management specialists. As a result, there is a need for, as well as a need for, significant changes in the existing legal system. Training, post-disaster evaluation, monitoring of relief efforts, review and cooperation and coordination of Central, District, and Local level preparedness and research should all be included in rehabilitation and recovery plans. Immediate as well as long-term recovery programs should be included in recovery planning.

References

1. Nepal Disaster Risk Reduction Portal [Internet]. [cited 2021 Jun 21]. Available from: <http://drrportal.gov.np/risk-profile-of-nepal>
2. efforts_of_nepal_towards_building_a_disaster_resilient_country_2019-04-08 08-53-17.pdf [Internet]. [cited 2021 Jun 21]. Available from: http://dpnet.org.np/uploads/files/efforts_of_nepal_towards_building_a_disaster_resilient_country%202019-04-08%2008-53-17.pdf
3. Ministry of Home Affairs, Nepal Nepal Earthquake 2072 : Situation Update as of 11 th May - PDF Free Download [Internet]. [cited 2021 Jun 21]. Available from: <https://docplayer.net/14775395-Ministry-of-home-affairs-nepal-nepal-earthquake-2072-situation-update-as-of-11-th-may.html>
4. Rasul G, Sharma B, Mishra B, Neupane N, Dorji T, Khadka MS, et al. Strategic framework for resilient livelihoods in earthquake - affected areas of Nepal. ICIMOD Work Pap [Internet]. 2015 [cited 2021 Jun 21];(No.2015/6). Available from: <https://www.cabdirect.org/cabdirect/abstract/20163181488>
5. PDNA_volume_BFinalVersion.pdf [Internet]. [cited 2021 Jun 21]. Available from: https://www.npc.gov.np/images/category/PDNA_volume_BFinalVersion.pdf
6. Walshe R, Nunn P. Integration of Indigenous Knowledge and Disaster Risk Reduction: A Case Study from Baie Martelli, Pentecost Island, Vanuatu. *Int J Disaster Risk Sci*. 2012 Dec 1;3:185–94.
7. Tuladhar G, Yatabe R, Dahal RK, Bhandary NP. Knowledge of disaster risk reduction among school students in Nepal. *Geomat Nat Hazards Risk*. 2014 Jul 3;5(3):190–207.
8. Disaster risk reduction in school curricula: case studies from thirty countries | PreventionWeb.net [Internet]. [cited 2021 Jun 21]. Available from: <https://www.preventionweb.net/publications/view/27715>
9. Tuladhar G. Disaster Management System in Nepal - Policy Issues and Solutions. *J Risk Anal Crisis Response*. 2012 Nov 1;2:166.
10. Youth Vision-2025_2.pdf [Internet]. [cited 2021 Jun 21]. Available from: http://moys.gov.np/sites/default/files/nitiheru/Youth%20Vision-2025_2.pdf
11. Types of disasters - IFRC [Internet]. [cited 2021 Jun 21]. Available from: <https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/definition-of-hazard/>

12. Weichselgartner J, Pigeon P. The Role of Knowledge in Disaster Risk Reduction. *Int J Disaster Risk Sci*. 2015 Jun 17;6:107–16.
13. Ngo EB. When Disasters and Age Collide: Reviewing Vulnerability of the Elderly. *Nat Hazards Rev*. 2001 May 1;2(2):80–9.
14. Ton K, Gaillard J, Adamson C, Akgungor C, Ho H. Expanding the Capabilities of People with Disabilities in Disaster Risk Reduction. *Int J Disaster Risk Reduct*. 2018 Nov 1;34.
15. Kolmannskog V. Climate change, natural disasters and displacement: A multi-track approach to filling the protection gaps. *Int Rev Red Cross*. 2010 Sep 1;92:713–30.
16. Das T. River Bank Erosion Induced Human Displacement and Its Consequences. *Living Rev Landsc Res*. 2014 Oct 27;8.
17. 329.pdf [Internet]. [cited 2021 Jun 21]. Available from: <http://www.drrportal.gov.np/uploads/document/329.pdf>
18. Pant R, Bishwakarma K, Ghimire A, Shrestha K, Maskey R, Joshi B, et al. DISASTER MANAGEMENT AND ROLE OF ACADEMIC INSTITUTIONS IN NEPAL: CURRENT STATUS AND WAY FORWARD. 2020 Aug 14;
19. Hoffmann R, Muttarak R. Learn from the Past, Prepare for the Future: Impacts of Education and Experience on Disaster Preparedness in the Philippines and Thailand. *World Dev*. 2017 Aug 1;96:32–51.
20. Mejri O, Pesaro G. Knowledge based strategies for Disaster Risk Reduction: a Knowledge Management framework to Increase Understanding and Awareness of Value of Prevention and Preparedness. 2015.
21. Hong Y, Kim J-S, Xiong L. Media exposure and individuals' emergency preparedness behaviors for coping with natural and human-made disasters. *J Environ Psychol*. 2019 Jun 1;63:82–91.