

## Disaster Risk Reduction Curriculum Integration: How Pakistan's Elementary Grade Geography Curriculum Responds?

**Khadija Jaffar<sup>1\*</sup>, Amjad Reba<sup>2</sup>, Hazri Bin Jamil<sup>3</sup>, Muhammad Iqbal<sup>4</sup>, Seema Azeem<sup>5</sup>**

<sup>1\*</sup> Department of Education, Faculty of Social Science, Balochistan University of Information Technology and Management Sciences (BUI-TMS) Quetta. +92,0812-881036(810), +92-3008521366

<sup>2</sup> Institute of Education & Research (IER), University of Peshawar. +92-091-9216756.

<sup>3</sup> School of Educational Studies, Universiti Sains Malaysia, 11800 USM, Penang +66532985.

<sup>4</sup> Postgraduate Medical Institute Quetta(PGMIQ). University of Balochistan. +92-081-9203164, +923346862558.

<sup>5</sup> Department of Education, Faculty of Social Science, Balochistan University of Information Technology and Management Sciences (BUI-TMS) Quetta.

\* <sup>1</sup> [Khadija.jaffar@buitms.edu.pk](mailto:Khadija.jaffar@buitms.edu.pk) (Khadija Jaffar)

<sup>2</sup> [amjadreba@uop.edu.pk](mailto:amjadreba@uop.edu.pk) (Amjad Reba)

<sup>3</sup> [hazri@usm.my](mailto:hazri@usm.my) (Hazri Bin Jamil)

<sup>4</sup> [miqbaljaffar@gmail.com](mailto:miqbaljaffar@gmail.com) (Muhammad Iqbal Khan)

<sup>5</sup> [seema.azim@buitms.edu.pk](mailto:seema.azim@buitms.edu.pk) (Seema Azeem)

## **Disaster Risk Reduction Curriculum Integration: How Pakistan's Elementary Grade Geography Curriculum Responds?**

### **Abstract**

This study investigated the content evaluation of Pakistan's elementary geography curriculum using national education policy guidelines with defined dimensions of DRR, namely knowledge, prevention, response, and emotional regulation. As a research technique, exploratory research design using content analysis was used, with a focus on the text in context reference and the number of times a text is used in textbooks. The following findings were made using the qualitative content analysis method: Geophysical, hydrological, metrological, climatological, and environmental risks and hazards were discussed, along with their causes and effects. However, the policy suggests including content in textbooks related to disaster response and trauma management that was absent from textbooks. Nevertheless, the information in the textbook was an expansion of information on risk management and disaster prevention that surely incorporate the DRR context in the curriculum.

**Kay words: Disaster Risk Reduction, Inclusion in Curriculum, Hazards, Curriculum, Disaster**

## Introduction:

A disaster is an unforeseeable, unexpected, and chaotic event that disrupts a system or organization and is characterized by a group's uncertainty, threat, and urgency regarding a problem. Similarly, it is a negative situation, and the concept of a positive outcome from a crisis is a relatively new concept in the literature as explained by Shaluf et al. (2003). The nature of the disaster and its local and international significance will have varying effects, but critical decisions must always be made quickly (Brinks & Ibert, 2020).

Disaster Risk Reduction (DRR) is defined as "the concept and practice of reducing disaster risks through systematic efforts to analyze and manage disaster causal factors, such as reduced risk exposure, lessened vulnerability of people and property, wise land and environmental management, and improved preparedness for adverse events." (UNISDR, 2009). At the third United Nations World Conference on Disasters, the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030 was adopted. SFDRR states that disaster risk reduction is critical to achieving sustainable development (ADR, 2015). Boshier (2008) and (Prabhakar et al., 2009) verified that several international agendas, frameworks, conferences, and United Nations programs have highlighted the significance of Disaster Risk Reduction Education (DRRE). Education is widely acknowledged to play a critical role in DRR, from the International Decade for Natural Disaster Reduction to the International Strategy for Disaster Reduction, the Hyogo Framework for Action 2005-2015, and the Sendai Framework for Disaster Risk Reduction 2015-2030. For several years, DRRE has been in the spotlight, and the teaching and learning research conducted around DRRE has yielded fruitful results.

The best way to guarantee the long-term viability of DRRE in schools may be to incorporate it into the curriculum (Nurdin, 2019). Infusing DRR across the curriculum entails identifying the key DRR-related knowledge, skills, and attitudes that students must acquire, as well as determining the capacity of each subject to carry out and deliver those learning needs (UNICEF, 2014). The formal education system and curriculum's inclusion of DRR has been acknowledged as a strategy to promote awareness and comprehension of disaster risks. Primarily in the disaster-affected nations, there have been reports of some early progress, such as Indonesia's initiative

to incorporate disaster risk reduction into the school curricula. In Indonesia, where the integration of DRR knowledge into the national curriculum and local implementation in schools was implemented, it was especially important to incorporate DRR knowledge into the science curriculum or topics that were related to it, such as climate change. Since climate change is the primary factor causing an increase in the likelihood of disasters like forest fires, the disaster causes both immediate and long-term economic losses and harm to public health (Agung et al., 2014). Carvalho and Leitão (2015) extend that according to this viewpoint, the system made up of educators, experts, and students should be aware of, value, and promote strategies that build resilience by giving educational communities the chance to deal with challenging circumstances. Examples include situations involving disaster planning and the management of emergencies brought on by both anthropogenic accidents and natural disasters.

The school administration, in particular teachers, must give the integration of DRR into the curriculum the proper support. The implementation of DRR is still hampered by teachers' lack of knowledge in this area. By offering sufficient training and guidelines, the issue can be reduced; as a result, DRR implementation will be simpler. According to the teachers, it would be advantageous for students to learn about climate change and disasters together (Bevc, 2008). Numerous studies have demonstrated that the impact of a disaster and how to lessen it depend not only on its frequency and intensity but also on how society responds, adapts, and uses coping mechanisms (UNISDR, 2005). The ability of coping mechanisms in society to provide a rational response to disaster is crucial. The same disaster or any climatic change will elicit different responses from various groups (Kohn et al., 2012; Lindell et al., 2009). Hung (2018) and Castañeda et al. (2020) Consider that the community's capacity for decision-making, its commitment to responsibility, and its level of cognitive development may all be contributing factors..

The most recent flood in Pakistan in 2022 is an illustration of how vulnerable the community and the country's children are to climatic change. Extreme rainfall and flooding are attributed to deteriorating weather patterns brought on by the climate crisis. How vulnerable the community and the children of the nation are to climatic change is demonstrated by the most recent flood in Pakistan in 2022. Deteriorating weather patterns caused by the climate crisis are to blame for extreme rainfall and flooding. Pakistan is one of the nation's most susceptible to the effects of climate change despite producing less than 1% of the global greenhouse gas emissions

(UNOCHA, 2022, September 1). Climate change has had a disproportionately negative impact on developing economies in recent decades, with Pakistan being particularly vulnerable given its location. These disasters have a negative effect on the economy and way of life. Pakistan is particularly vulnerable to climate disasters like droughts, floods, and extreme events because of its geographic location, socioeconomic factors, and ongoing episodic climatic fluctuations worldwide. (Farooq & Fatima, 2022). Different parts of Pakistan are experiencing varying degrees of climate stress, such as snowstorms, landslides, avalanches, and floods. Coastal areas are vulnerable to flooding and cyclones. Flooding threatens the central and mid-river basins, while drought threatens southern Punjab, Sindh, and Baluchistan (Sayed & González, 2014). Weak early warning systems, a lack of education-based awareness, a lack of adequate response resources, poorly planned infrastructure development, and high levels of poverty all contribute to the disaster's effects. As a result of a national policy recommendation to incorporate the DRR into the curriculum at all levels, the study focused on investigating the curriculum's responsiveness to the DRR.

Education plays a vital role to uplift the community from crises and reducing the effects of trauma. It provides a sense of normalcy and preparedness. Disaster management includes and prioritizes preparedness (Hatthakit & Chaowalit, 2011). Taghizadeh et al. (2012) explain It takes creative, economical, logical, human-centered, and need-driven interventions to create such a culture. The school is one of the key players in fostering preparedness. Schools play a number of strategic roles in disaster preparation. DRR knowledge dissemination, in addition to being a source of knowledge, serves as an active learning opportunity for communities, offering advice on how to prepare for them and what to do both during and after they strike. As a result, when it comes to improving public disaster preparedness, school readiness is critical (Takahashi et al., 2015). Disaster risk reduction is recognized as a tool for long-term sustainability and is recommended for inclusion in school curricula. Education for Sustainable Development (ESD) and Disaster Risk Reduction (DRR) can complement each other to improve educational relevance and quality. The primary goal of education has been proposed to be learning for adaptive capacity. (Didham & Ofei-Manu, 2020). ESD and DRR work together to develop the skills needed for real-world challenges. Education for sustainable development and disaster risk reduction share a focus on developing abilities and attitudes, as well as curriculum development. However, the concepts of sustainable development education and recovery education work in the same way. As a result, education for sustainable development has emerged as a critical concept and method (Oikawa, 2014).

## Research Question:

How does the curriculum at the elementary level respond to DRR?

## Method:

A content analysis method was used in an exploratory research design to examine how responsive DRR is to the curriculum. In the process of content analysis, the researcher counts the instances of a given word, phrase, or idea. Although there are many different types of texts that can be used for research, written documents are by far the most common (O'leary, 2014). At first, emphasis was placed on using Social Studies textbooks as a sample size, as was already the case with National Education Policy 2009. The elementary school geography textbooks were chosen as study samples based on their topical relevance. There was a question about the sample size of the document, Bowen (2009) suggests that a diverse set of documents is preferable, focusing on document quality rather than quantity. Therefore, to improve the quality of the analysis elementary grade curriculum(VI-VIII) was selected as a sample. The document's "unwitting" evidence or latent content is a major issue. (O'leary, 2014) explain that the latent content refers to the document's style, tone, agenda, facts, or opinions. This was an important first step that the researcher must remember. The unwitting and latent content was handled through interpretation of the text used in a context and proper references were mentioned against each sentence selected for analysis.

A list of commonly used DRR terminologies was identified from UNISDR, INEE, and other literature to explore policy, curriculum, and textbook responsiveness toward DRR. In an analysis of textbooks of Grades VI-VIII, the terminologies were further expanded to include the synonyms for operationalization, some of the terms that need to be used for the study's objectives should be operationalized (Merchant, 2015). To further operationalize the terms earthquakes, landslides, tsunamis, and volcanic activity were included as an example of geophysical hazards. Other types include hydrological (avalanches and floods), climatological (extreme heat, drought, and wildfires), meteorological (cyclones and storms/wave surges), and biological (disease epidemics and insect/animal plagues)(IFRC, 2021). Further explanations of the DRR terms mentioned above were used to explore the minimum inclusion of DRR in textbooks.

All of these terminologies' presentations were evaluated using the text-in-context principle using summative content analysis. In summative content analysis, keywords or other pieces of content are counted and compared, and then the context is interpreted. The study of summative content analysis begins with keywords. keywords are

identified before and during data analysis and are derived from a literature review or the researchers' interests (Hsieh & Shannon, 2005). For interpretation and reference, the text's context was identified and quoted (document, page numbers). The number of times the term was used and mentioned, as well as the interpretation for each context.

## **Analysis and Findings of the Study:**

### **VI Social Studies Text Book:**

The textbook of Grade VI was explored to investigate the responsiveness of DRR in textbooks, the textbook of Grade VI was also explored to investigate the terminologies and the context in which the identified terminologies were used. The main focus was to explore DRR responsiveness in the textbook.

### **Capacity**

The Term Capacity was used a single time (01) in the textbook of Social Studies grade VI. The word capacity in context to DRR is "A community, society, or organization's totality of its strengths, qualities, and resources put together to achieve predetermined goals (UNISDR, 2009). In the textbook, the text of the context is related to the hierarchy of settlement of the community.

*"A settlement's hierarchy is determined by its capacity to meet the needs of other settlements around it."*

*(Social Studies VI-grade, Chapter 08, Page 84)*

The word capacity was used in the context of the general capacity of an area to fulfil the needs of neighbouring communities of an area not in the context of DRR.

### **Geographical Disaster (Earthquake)**

The geographical hazards are divided into earthquakes, volcanic activities, landslides, and tsunamis, the geographical hazards (earthquake) are reflected two times (02) in the text.

*"Because of the Earth's internal heat, these plates move slowly in different directions, resulting in earthquakes, volcanism, and metamorphism"*

*(Social Studies VI-grade, Chapter 08, Page 84)*

*"Japan is a country, which is frequently hit by earthquakes. In 1923, Tokyo was struck by a great earthquake, which took a toll of around 150 thousand human lives"*

*(Social Studies VI-grade, Chapter 08, Page 89)*

The text earthquake was first time used in context to provide knowledge about the causes of earthquakes. Due to the internal heat of the earth, the plates move in different directions opposite to the pressure or heat, this movement either causes an earthquake or volcanism. The second time, the text was used in the context of the consequences of the disaster that caused a high death rate. The context of the text was to provide knowledge about hazards, their causes, and disaster. Providing information that will aid in prevention, response, and emotion control. Disaster knowledge can ensure effective lesson learning as well as the accessibility and availability of reliable and accurate disaster information when it is needed. The successful management of disasters will be aided by the identification of key disaster knowledge factors. (Pathirage et al., 2012).

### **Geographical Disaster (Volcanic activity)**

The term Volcanic activity was mentioned a single time in the textbook of grade VI, the content of the text is given below

*"During the volcanic activity, hot magma erupts slowly and solidifies around the vent of the volcano.' As a result, the vent grows to become a mountain known as a volcanic mountain."*

*(Social Studies VI-grade, Chapter 05, Page 46)*

The text volcanic activity was discussed in the context of the process of formation of volcanic mountains. The text presents knowledge about the results of volcanic activity associated with the known experience. the fact or state of knowing something with a high degree of familiarity as a result of experience, association, or contact (Mohanty et al., 2006). The analysis of VI Grade book of Social studies possesses the knowledge directly related to the DRR. Geographical Disasters with an example of the movement of tectonic plates and volcanic activities were discussed. A disaster knowledge aspect was added in the textbook with causes of Geographical Hazards but with a lack of a holistic view about different other disasters (biological, hydrological, climatological, and metrological) in the context of Balochistan and Pakistan. The key terms identified were not discussed directly and no synonyms were debated in the grade VI Social studies textbook.

### **VII Social Studies Text Book:**



The textbook of Social Studies VII was explored to investigate the responsiveness of the textbook towards DRR, the textbook of Social Studies VII incorporates different terms identified as terminologies related to DRR.

### **Affected:**

The term affected in EiE/DRR is having direct or indirect harm to the economic, physical, social, cultural, and environmental assets of the community (UNISDR, 2009). The term affected was used a single time (01) in the geography textbook of Grade VII, the text affected was used in the context of effects on Human settlement at banks of rivers and streams.

*“Impacts on human settlements during floods in rivers or streams, erosion destroys settlements on banks. Landslides have an affect on communities located in foothills and on slopes”*

*(Social Studies VII grade, Chapter 04, Page 21)*

The context of the text explains that human settlement is affected by floods due to land sliding. The term affected directly represents the direct harm to the environmental assets of the community during a disaster. The context reflects the situation of disaster and possible risks in human settlements near streams and rivers during floods. Text is used in providing knowledge about the consequences of the disaster on human settlement. Teachers and students need to understand disaster risk reduction to develop an understanding of the causes, characteristics, and effects of natural hazards. Additionally, it fosters a variety of abilities and capacities so that students and teachers can actively participate in disaster mitigation and prevention (Tuladhar et al., 2014).

### **Disaster:**

The term disaster is a serious disruption in the functioning of a community or society at any scale associated with hazardous events interacting with conditions of exposure, vulnerability, and capacity, resulting in one or more of the following losses and impacts: human, material, economic, and environmental (UNISDR, 2009). The term Disaster was used in the context of developing an understanding of the situation and preventing disaster by levelling the slops to avoid hazards. The unleveled slops were considered a hazard that can cause disaster

*“The steep slopes need to be levelled to prevent any disaster”*  
*(Social Studies VII grade, Chapter 02, Page 22)*

The complete avoidance of negative effects from risks and associated disasters is referred to as disaster prevention (INEE, 2004). By taking proactive measures in advance, prevention expresses the idea and intention to eliminate any potential negative effects of any hazard. The context focused on the preventive measures to avoid the disaster.

### **Climate change:**

Climate change is defined as "a change in the climate that can be directly or indirectly attributed to human activity that modifies the composition of the global atmosphere and occurs in addition to natural climate variability seen over comparable time periods"(INEE, 2004). The term climate change in a textbook of social studies VII grade was used 02 times. The context of the text represents a description of climate change over the earth's surface to provide insight.

*“Explain the climate change across the surface of the Earth”  
(Social Studies VII grade, Chapter 03, Page 25)*

The context of the text climate change was to have a look on at a matter to provide information/knowledge to students which was further extended as a discussion on text:

*“Furthermore, scientists agree that certain human activities, such as the release of certain substances into the atmosphere, contribute to the greenhouse effect, which is responsible for climate change.”  
(Social Studies VII grade, Chapter 03, Page 30)*

The text further discussed the human activities and emission of substances caused by greenhouse gases that cause climate change. Greenhouse gases are gases that are part of the atmosphere and absorb and emit thermal infrared radiation from the Earth's surface, the atmosphere, and clouds. The context focuses that human activities, that raise the concentration of GHG, such as the emission of chlorofluorocarbons(CFC) methane, etc. Cause the greenhouse effect. The Green House effect increases the earth's temperature resulting in climatological hazards.

### **Exposure:**

People, things, systems, or other things that are present in hazard zones and are consequently vulnerable to potential losses are referred to as exposure (INEE, 2004). The text “Exposure” was used in the context of Ozone layer distraction and human exposure to UV rays. The context of the text focuses on the overexposure to ultraviolet rays causes damage to living cells. The context provides knowledge about the risks of overexposure. It is further discussed that;

*“Ozone layer shields us from the damaging effects of the sun's ultraviolet rays by absorbing them. Overexposure to these rays could cause harm to the body cells of living things”*

It was further discussed that more exposure to UV rays can cause serious health issues.

*“Humans who receive too much exposure to these rays develop skin cancer and eye disease”*

*(Social Studies VII grade, Chapter 03, Page 32)*

The text was used in context to provide knowledge about a hazard that can badly affect human health and cause danger. All living things on the planet are significantly impacted environmentally and biologically by changes in solar UV radiation intensity brought on by stratospheric ozone depletion, especially UV-B radiation. Humans may suffer negative effects from reactions to rising UV-B radiation, especially in terms of the prevalence of eye cataracts and skin cancers like malignant melanoma (Solomon, 2008).

### **Greenhouse gas (GHG):**

Greenhouse gases are gaseous atmospheric constituents that absorb and emit thermal infrared radiation emitted by the Earth's surface, atmosphere, and clouds. (INEE, 2004). The text was discussed in context to provide knowledge about the text and the consequences caused by greenhouse gases.

*“The Earth's average annual temperature is rising as greenhouse gas concentrations rise. As a result, polar and mountain glaciers are rapidly melting”*

*(Social Studies VII grade, Chapter 03, Page 33)*

The text explains that Greenhouse gas emissions have far-reaching environmental and health consequences. They contribute to respiratory disease due to smog and air pollution, and they cause climate change by trapping heat. Other effects of climate change caused by greenhouse gases include extreme weather. Due to extreme weather conditions, the polar and mountain glaciers are rapidly melting.

### **Geological hazard:**

The geographical hazards were discussed Ten Times (10) in the textbook of social studies grade VI. These Hazards include earthquakes, tsunamis, and Volcanism. The text is used in the context of providing knowledge about the causes of earthquakes. The context states that commonly due to the horizontal movement of plates, majority of the earthquakes are caused.

*‘The majority of earthquakes are caused by horizontal plate movement’*

*(Social Studies VII grade, Chapter 01, Page 05)*

The text was used a second time in context to develop an understanding of the plate arrangement and geographical area of Pakistan. Context explains the geographical positioning of the Himalayan fault of plates that cause earthquakes in northern areas of Pakistan and Azad Jammu and Kashmir.

*‘The fraction of Himalayan Faults is the main cause of earthquakes in Northern Areas and Khyber Pakhtunkhwa Province of Pakistan and Azad Jammu and Kashmir’*

*(Social Studies VII grade, Chapter 01, Page 06)*

The text was used further in context to provide knowledge about the cause of tsunamis and earthquakes. when the stored energy exceeds, that exerts pressure on weak rocks, causing a fracture that results in an earthquake.

*‘When the stored energy's pressure exceeds a certain point, the rocks fracture at comparatively weak points, resulting in an earthquake.’*

*(Social Studies VII grade, Chapter 01, Page 06)*

The text related to geographical hazards was further extended to discuss the Volcanism and earthquake process parallel. The process explains another reason for earthquakes and volcanic activity.

*‘Deep within the Earth, magma with a gas mixture exists. These gases are constantly under pressure as they expand and escape from the Earth's interior. However, due to the massive weight of the upper layer, the gases cannot easily escape. However, when their pressure exceeds a certain threshold, the gases, along with lava, erupt through weak points in the Earth's crust, causing earthquakes’*

*(Social Studies VII grade, Chapter 01, Page 06)*

The text Earthquake and the concept of Volcanic activity were discussed in the context of a scientific process where internal gases at the earth's crust cause earth jolts and Lava eruptions, the context provides information about the hazard to provide knowledge. Further, the provision of knowledge extended to disaster impacts and mitigation.

*“Buildings collapse as a result of earthquake jolts, and roads, railways, and other forms of communication infrastructure are destroyed by surface cracks in the Earth. Leaks in oil and gas pipelines result in fire accidents, and earthquakes in the ocean cause enormous waves are known as tsunamis”*

(Social Studies VII grade, Chapter 01, Page 06)

The text was further discussed in context to cause other disasters and incidents to provide sufficient knowledge for prevention and mitigating the effects of hazards. That includes tsunamis in coastal areas, leaking of gas and oil pipelines, etc. The discussion on parallel hazards was to educate the students on related hazards that contribute to a disaster. The geographical Hazards (earthquakes) were further discussed to get opportunities from the disaster.

The context of the text discussed that the disaster may provide other opportunities like the rise of groundwater level and mineral exposure. Apart from the opportunities, the concept linking with other opportunities and possible risks was shared to have a holistic view of possibilities for the benefit and to avoid other possible risks.

*“Earthquakes cause to rise in the underground water level and expose minerals”*

(Social Studies VII grade, Chapter 01, Page 06)

The knowledge was further extended to the use of similar concepts, to enhance students’ awareness and link the text with other subject matter.

*“Seismic zones, also known as earthquake zones, are prone to mass wasting”*

(Social Studies VII grade, Chapter 02, Page 21)

The text was further linked with the concept of Mass wasting, in which the loose material that weathering creates naturally slides downslope due to gravity. Rock and soil moving downslope under the effect of gravity are known as mass wasting. This process is also known as a landslide. The context of the text was linked with the hazard of mass wasting. The content was used to develop a further understanding of the students with the concept of mass wasting, and the link was established among possible hazards that the earthquake zones are prone to mass wasting.

The main cause of rock uplift in mountain ranges is shallow earthquakes. Large shallow earthquakes, however, also result in widespread, coseismal landslides that significantly but unevenly cause erosion (Larsen et al., 2010; Malamud et al., 2004).

**Hydro-meteorological hazards:**

The term related to hydro-meteorological hazards includes Avalanches and Floods. The term was discussed three (03) times in the textbook of Social Studies grade VI. The text was used in context to provide information on the impact of Floods on Human settlement. These negative impacts include the destruction of the settlement area. The content states that flooding is having effects on human settlements near river banks and streams due to the process of erosion.

*‘Effects on human habitations Settlements on the banks of rivers and streams are destroyed by erosion during floods’*  
(Social Studies VII grade, Chapter 02, Page 21)

The impacts of the disaster were further discussed and rainfall and floods can cause permanent and temporary damage to roads, infrastructure, and to livelihood. Land sliding also causes damage to humans, livestock, and the property

*‘Excessive rainfall and flooding destroy dikes and canals, and damage roads temporarily or permanently, Land sliding also damages or blocks roads. This results in the massive crop, human, and property destruction’*  
(Social Studies VII grade, Chapter 02, Page 21,79)

The hydrological Hazard was discussed in context to provide knowledge about the effects of disaster on living areas, infrastructure, and livelihood. Further, the context of hydrological hazards is also linked to disasters specifically floods and other possible risks of land sliding and erosion that contribute to damages to humans, property, and livelihood.

**Risk:**

The word risk is the likelihood of an event and its unfavorable effects combined (UNDRR, 2009). The word Risk was used two (02) times in the textbook of social Studies grade VI. The text was used in context to explain the advantages of vegetation, that in the presence of Vegetation, Mass wasting chances are reduced.

*‘Areas devoid of vegetation continue to be at risk of mass wasting. When vegetation is planted along the banks of waterways and on mountain slopes, the risk of Erosion and mass wasting is less likely to occur’*

(Social Studies VII grade, Chapter 02, Pages 21,22)

The context provides information about the concept of the risk of mass wasting which can be reduced by plantation processes near banks and waterways. context support that due to the plantation process on waterways and river banks the process of mass-wasting and erosion can be reduced as the roots of the plants hold soil tightly. The context focuses on the mitigation strategies to avoid the risk.

### **Metrological Hazards:**

Metrological hazards include those that are atmospheric, such as storm surges along the coast and cyclones, typhoons, and hurricanes. Other hazards like landslides, wildland fires, locust plagues, epidemics, and the transport and dispersion of toxic substances may also be directly impacted by hydro-meteorological conditions (UNISDR, 2009). The text related to Metrological hazards was discussed in a context to provide knowledge about the type of occurrence and possible destruction that can be caused.

*‘Tropical cyclones form in the seas of tropical areas; they are very powerful and extensively devastate the areas they pass through. Additionally, they cause enormous sea waves that, when they breach coastal lands, result in material and human losses’*

(Social Studies VII grade, Chapter 05, Pages 56)

The text related to metrological hazard, Cyclone was discussed three (03) times in context to differentiate different types of cyclones in different areas with possible risks of destruction. The context is to provide knowledge about the possibility of risk according to the nature and intensity of the cyclone. Tuladhar et al. (2014) verify that education about disaster risk reduction (DRR) for students and teachers in schools is essential for developing a shared knowledge of the causes, nature, and effects of natural hazards.

*‘Compared to tropical cyclones, temperate cyclones affect larger areas, covering more than 1,000 sq. km.’*

(Social Studies VII grade, Chapter 05, Pages 56.)

The text was second time discussed in context to provide an understanding of the high range of cyclonic activity for the proactive DRR approach. Additionally, it fosters a

variety of skills and competencies so that students and teachers can actively contribute to disaster prevention and mitigation (Tuladhar et al., 2014).

*“Tornados are small but very strong cyclones in North America and Australia these cyclones frequently appear and cause heavy damage”*

(Social Studies VII grade, Chapter 05, Pages 57)

The text is further used in the context of additional information on hazards in different regions where cyclonic activities happen more strongly. Numerous studies have also looked at the impact of students participating in disaster education programs, and the results have always been very positive (Ronan et al., 2010).

### **Climatological Hazards:**

The term related to climatological hazard includes Extreme Temperature, Drought, and Wildfire (IFRC, 2021). The text related to climatological hazards was discussed in the context of the effects of flood or drought on agricultural and industrial production. Disasters results, Property damage, economic loss (such as lost income or a halt in production), significant disruption of social services (including breakdowns in communications), and an excessive burden on essential services (Hobbs, 1987).

*“Industrial production falls off when crops are harmed by floods or droughts.*

(Social Studies VII grade, Chapter 02, Pages 21,22)

The context of the text focuses on the results of floods and droughts that cause losses in the industrial production of crops. Floods and drought are climatological hazards, and the knowledge about climate change and its consequences helps in disaster preparedness and mitigation. Disaster risk reduction efforts should include both climate mitigation and adaptation (Thomas & López, 2015).

The textbook of Social Studies grade VII, Includes DRR-responsive material, directly related to knowledge, prevention, and consequences of these disasters. The knowledge and prevention of DRR-related material embed a holistic understanding of the disaster, its effect, and risk information of other possible hazards resulting in disaster. In the textbook of Social Studies grade VII, the reflection of terminologies identified to investigate the responsiveness was found to a lesser extent, however, the content related to Climatological hazards, metrological hazards, hydrological hazards, disaster,



risk, Green House Gases, was directly reflected DRR responsiveness in the textbook of social studies grade VII. A few DRR-related terms, affected, exposure, and climate change were also used in the context of Disaster Risk Reduction.

### **VIII Social Studies Text Book:**

In continuation of textbook analysis to explore to investigate the responsiveness of textbooks towards DRR, the textbook of Social Studies VIII was also analyzed in terms to identify text in context reflection of different terminologies related to DRR to investigate the DRR responsiveness.

#### **Geological hazards:**

The term related to geographical hazards was discussed seventeen (17) times in the textbook of Social Studies grade VIII. A geographical hazard is a natural geographic occurrence brought on by ground instability that poses a risk to human life and property. The vast scope and catastrophic effects of geographic hazards have wracked the majority of the world's nations (Rui & Guili, 2014). The term geographical hazards include earthquakes, Land sliding, Tsunamis, and Volcanic activity. The text related to geographical hazards (Earthquakes and volcanoes) was discussed in the below contexts.

#### **Earthquakes and volcanoes:**

*‘Internal forces such as earthquakes and volcanoes create mountains, plateaus, valleys, gorges, and dunes’*

(Social Studies VIII grade, Chapter 02, Page 12)

The text related to geographical hazard earthquakes and volcanoes was discussed in context as change agents in the geographical appearance of the f earth, as per the text dunes, gorges, valleys, and mountains are formed as a result of the earthquake and volcanic activities.

**Earthquake:** The term Earthquake was discussed as a complete topic in the textbook of social studies grade VIII, and discussed ten times (10). the content related to earthquakes is discussed as under.

*‘Earthquakes are caused by movement in the earth's crust. The movement of tectonic plates in multiple directions and at different speeds causes vibration in the earth's crust and the release of a massive*

*amount of energy, which is what we call an earthquake'' Earthquake experts monitor ground movement constantly to warn people living in earthquake-prone areas''*

(Social Studies VIII grade, Chapter 04, Pages 60-62)

The text was discussed in context to provide knowledge about the causes of an earthquake where it was mentioned that the movement of tectonic plates in the earth's crust cause an earthquake. It was also mentioned that the movement of these plates releases a huge amount of energy. Further, it was pointed out in the text that the experts in the field are continuously monitoring the movement of plates to observe the plate location and to predict any possible tremor to warn the community living in earthquake-prone areas. In the above context, the text Earthquake was mentioned to provide knowledge related to the causes of earthquakes.

*'An earthquake is extremely dangerous because thousands of individuals die and buildings are destroyed in a matter of seconds. In Pakistan, the mountainous areas of the north and Balochistan are important earthquake epicentres, with frequent low and high-intensity earthquakes''*

(Social Studies VIII grade, Chapter 04, Pages 60-62)

The content was further expanded to discuss the severity of the hazard that the earthquake can cause a massive disaster in a duration of seconds. Because thousands of people die and buildings may be destroyed. The text was providing knowledge that the hazard of earthquake converts to disaster if people die and buildings are destroyed. The knowledge was further expended to provide information about the geographical location of Pakistan/Balochistan which is prone to earthquakes and frequently experiences low and high-frequency earthquakes. According to the Global Seismic Hazard Assessment Program map, Parts of the Balochistan region within and around Quetta, extend to the Afghan border and western parts of Balochistan, including the Makran coast to the Iranian border. are the most vulnerable parts of Pakistan to earthquakes (Maqsood & Schwarz, 2008).

*'Earthquakes cause extensive damage to people and buildings; landslides take place and landforms are distorted. To build earthquake-resistant structures, the scientific method of construction should be used''*

(Social Studies VIII grade, Chapter 04, Pages 60-62)

The content related to the text was further expanded to share knowledge that the earthquake caused damage to people and property at an extensive level. The earthquake in northern Pakistan on October 8, 2005, resulted in catastrophic loss of life and massive damage. The loss of housing, disruption of economic activities, loss of food stores, and destruction of water and sanitation systems all increased the likelihood of the situation deteriorating (Sullivan & Hossain, 2010). The context of the text also shares information that earthquake jolts can cause landslides which results in landform destruction. Many mountainous areas prone to landslides have also had at least moderate rates of earthquake occurrence in recorded history. Earthquakes in steep landslide-prone areas significantly increase the likelihood of landslides occurring, either due to ground shaking alone or shaking-caused dilation of soil materials, allowing rapid infiltration of water. The 1964 Great Alaska Earthquake caused widespread landslides and other ground failures, accounting for the majority of the earthquake's monetary loss (Highland, 2004). As a preventive measure against the damages of the earthquake, the construction of buildings and houses must be done on scientific methods. The advice to the construction of the building was to provide knowledge for the prevention of damage.

*‘When an earthquake occurs, people should be aware that they must immediately leave their homes and offices and move to open space. Stairs should always be used when leaving a building during an earthquake rather than a lift. If evacuation is not possible during an earthquake, stand under the doorframe, stairs, or a hard surface such as a table. A team of individuals should be formed and trained on safety precautions to assist others during an earthquake’*

(Social Studies VIII grade, Chapter 04, Pages 60-62)

The text was discussed in context to provide all precautionary measures related to the text earthquake. As a precautionary measure, a few recommendations were mentioned in the textbook related to Earthquake, like individuals' awareness about evacuating from the building during an earthquake, use of stairs rather than the lift during the earthquake, and if not possible to evacuate then the possible safe spaces to protect self during and in case of the building demolished. The text was discussed in the context of prevention from the disaster.

**Volcanism:** The term Volcanism was discussed three times in the textbook of Social Studies grade VIII, the context of the text was related to providing knowledge about the activity, severity, and context of Pakistan.

*‘A process known as volcanism occurs when hot molten rock, or magma, erupts from the interior of the earth and either silently or violently flows across the surface as lava. Scientists monitor volcanic activity and issue evacuation advisories because it is dangerous. Pakistan's volcanic cliffs serve as evidence that the area experienced volcanic activity’*

(Social Studies VIII grade, Chapter 04, Pages 51-52)

The term volcanism or relevant terms like volcanic activity was used to provide knowledge about the process, in which molten rocks erupt from the surface of the earth, making noise or silently flowing as lava. Lava eruption is the movement of magma from crustal storage zones to the surface. Magma reservoirs can feed volcanic eruptions if they contain hot, mobile magma and can supply enough energy for the magma to reach the surface (Caricchi et al., 2021). The term was further discussed to be emphasized that the monitoring of possible eruption is important from the side of the scientist as the volcanic activity is dangerous and the community living in areas needs to evacuate from the area. The text was third time discussed as evidence of volcanic activities that happened in Pakistan and the volcanic cliffs are found.

**Landslides:** The term landslides were used three times in the textbook of social studies grade VIII. The term landslide was discussed under the broader term of geographical hazards. The text was discussed in context to provide knowledge about the process of land sliding and its nature of severity and preventive measure from land sliding

*‘Landslides are the most frequent and dangerous natural hazard in mountainous areas of the world. A landslide is the downward movement of rocks and debris caused by gravity. Deterring the cutting of forests on mountainsides is an important step in reducing landslides because trees roots stabilize the soil’*

(Social Studies VIII grade, Chapter 04, Pages 52-53)

The text land sliding was discussed first time in the context of a dangerous natural hazard in mountainous areas of the world. it was further mentioned that the frequency of land sliding is high in hilly areas of the world. Landslides are a common type of relief and a dangerous natural hazard. Landslide movement can have negative consequences, such as damage to roads, forests, buildings, or even fatalities(Šilhán, 2021).

The text was a second time used in the context of explaining the causes of landslides, due to gravity, the heavy rocks and the broken fragments of rocks move downward. The text was third time discussed in context to have preventive measures to control the landslide process. It was discussed that preventing the cutting of trees in the mountain forest reduces the process of land sliding because the roots of the trees enhance soil stability. Landslide hazards can be influenced by natural resource management and rural development activities, such as forest management, road construction, and agricultural practices. Vegetation cover and its utilizations may play a role in mitigating the risk of landslides., it does play a role in mitigating the processes leading to increased landslide hazards such as gully erosion. Thus, forest management and development are of particular concern (Dolidon et al., 2009).

**Hydrological hazards:** The term related to hydro-meteorological hazards includes Avalanches and floods according to DRR-related defined terminologies in this study. Extreme meteorological and climatic conditions events, such as floods, hurricanes, and tornadoes, cause hydro-meteorological hazards (Wu et al., 2016). The terms avalanche and the flood was used in contexts of knowledge provision. the term related to hydrological hazards was discussed seven (07) times in the textbook of social studies grade VIII.

#### **Avalanches:**

The term avalanches were discussed only a single time in the textbook of Social studies grade VIII. The context of the text is discussed below.

*‘The increase in massive avalanches of snow and rock is the result of earthquake shock and climate changes caused by global warming’*

(Social Studies VIII grade, Chapter 04, Pages 53)

The term avalanches were discussed in context to provide knowledge about the causes of hazard, as per the context, earthquake and climate change due to global warming, cause massive avalanches of snow and rocks. The context shows that earthquakes if

happened can cause the hazard of snow and rock avalanches as well similarly the context of global warming was also included in the context to make students aware of the whole ecosystem of the earth and that a dis-balance in the ecosystem can link different hazards with each other.

**Flooding:** The flood was discussed six times in the textbook of Social Studies grade VIII. Flood as a hazard was discussed under the broader term of hydro-metrological hazards.

*‘‘The most common risk is flooding. The overflow of water from river banks is referred to as a flood. Floods are classified as high, medium, or low based on the rate of water discharge’’*

(Social Studies VIII grade, Chapter 04, Page 56)

The flood in above mention context was accepted as a common risk. Due to the momentum of the world's water cycle, the risks associated with flooding to infrastructure and the populace are continuing to rise (Webster et al., 2005). The term flood was discussed a second time in context to know the intensity of the nature of flood on the level of discharge of water, either low, medium, or high. High-level water discharge means high-level flood, medium-level discharge associated with a medium level of hazard, and so on. The context of providing this information is to prepare for response and precautionary measures. The text was third time discussed in context to link with global warming and other risks after flooding.

*‘‘Melting glaciers as temperatures rise is a natural cause of flooding. Floods cause widespread devastation. Not only are many people killed, but the flood also causes the spread of water-borne diseases and epidemics’’*

(Social Studies VIII grade, Chapter 04, Pages 56)

The text flood was discussed in context to link the text with global warming, text states that due to global warming, the melting of glaciers causes flooding. Growing worries about future flood risks and their effects on human societies are being caused by the intensification of the hydrological cycle as a result of global warming and possibly increased extreme rainfall (Alfieri et al., 2017) Climate change alters how frequently and intensely weather events occur, which frequently causes heat waves, floods, and droughts in many parts of the world (Curriero et al., 2001). The text was further discussed to communicate the consequences of the flood. Floods cause many destructions, not only are many people killed but there is a risk of epidemics and water-

borne diseases after floods. Extreme events like flooding have been linked to an increase in water-borne disease outbreaks in both developed and developing nations. Numerous studies have shown that high precipitation rates increase the concentration of chemical and microbiological agents in surface water, which increases the incidence of gastrointestinal diseases (Eisenreich et al., 2005).

*‘Cutting down forests on river flood plains must be prohibited because trees slow the flow of water and prevent land and embankment erosion’*

(Social Studies VIII grade, Chapter 04, Pages 55-57)

The text was discussed in context to provide knowledge about reducing the high-intensity damages from floods, there must be a prohibition of cutting forests on the river, and plan land, which can slow down the flow of water that ultimately reduce the intensity of water flow and lessen the process of erosion. When used diligently and thoughtfully, properly planted and managed woodlands can reduce flood risk and delay flood peaks, both geographically and temporally (Cooper et al., 2021).

### **Metrological Hazards:**

The terms related to metrological hazards were three (03) times discussed in the textbook of Social Studies grade VIII. Extreme weather events like tropical cyclones, heavy rain, and high winds have a significant effect on societal infrastructure. Those very extreme phenomena are meteorological hazards that can occasionally cause catastrophes (Takemi et al., 2016).

### **Cyclone**

*‘A cyclone is a large air mass that forms in the ocean and rotates around a powerful centre of low atmosphere. Tropical cyclones are unlikely to form along Pakistan's coast. To safeguard against the destruction caused by cyclones in coastal areas, the metrological department forecasts and monitors the cyclone's occurrence. The government and the media are critical in disseminating up-to-date information about the cyclone and assisting people in evacuating high-risk areas’*

(Social Studies VIII grade, Chapter 04, Pages 57-58)

The term cyclone was discussed five times in the textbook of Social Studies grade VIII. The term was first time used to discuss that a large air mass in oceans around a powerful center of low mass causes cyclones. The text was the second time discussed in the context of Pakistan, that there are fewer possibilities of cyclones in Pakistan's coastal areas. Pakistan is geographically in the arid region of the world (Fatima & Safdar,

2011). Historically, arid regions worldwide have been at a higher risk of flooding due to heavy rainfall. The text was a third time used in context to the monitoring of cyclone occurrence. To safeguard the community from any hazard metrological department continuously monitors the occurrence of the cyclone. The term was used in context to the subject of information from the side of the government and the media to communicate possible danger to the community to help them to evacuate from the area. Natural hazard early warning systems (EWS) are based on sound technical and scientific principles. However, a strong emphasis must be placed on those who are at risk, as well as a systems approach that takes into account all of the key risk factors (Shah et al., 2022).

### **Climatological Hazards:**

The climatological hazards include Extreme Temperature, Drought, and Wildfire in terminology for the study. ‘Wildfire’ a term related to climatological hazards was discussed in the textbook of Social Studies grade VIII. The context of the text is discussed below. The term related to climatological hazards was discussed five Times in the textbook of social studies grade VIII.

### **Wildfire:**

The term wildfire was used three (03) times in the textbook of social studies grade V III. In context to meanings, community vulnerability, causes of wildfire, and the preventive measures used to protect and avoid wildfire.

*“Uncontrolled fires are referred to as wildfires. Wildfires destroy human settlements, destroy forests, and kill wildlife. People and animals are killed as a result of the effects of smoke and fire”*

(Social Studies VIII grade, Chapter 04, Page 58)

The term Wildfire was used first time in context to know the term which means wildfires are uncontrolled fires. The term was a second time used in context to identify the vulnerability of humans, animals, and wildlife. since as a result of wildfire people and animals are killed due to smoke and fire, and forests and wildlife are destroyed. Among the natural disasters that impact human communities and the ecosystems on which we depend, fire is unique (McCaffrey, 2004). Wildfire risk is viewed by researchers as a combination of ecological and social construct vulnerabilities (Flint & Luloff, 2007). The antecedent climate, the weather at the time of the fire, the vegetation's structure and composition, and the quantity and distribution of live and dead fuels can all be used to infer the effects of a specific fire (Reinhardt, 1997).



*“Wildfires or fires can be caused by human activity or by natural causes; to prevent forest fires caused by humans, it is necessary to provide instructions to people visiting parks for picnics as well as trained firefighters who can respond quickly before a fire gets out of control”*

(Social Studies VIII grade, Chapter 04, Pages 58-60)

The term was third time discussed in the context of a result of human activity or a natural cause of a wildfire, to prevent it as a result of human activity, providing instruction to the people visiting parks or forests can be helpful. A deeper knowledge of the patterns and causes of fire ignition is necessary for measures of fire prevention (Calviño-Cancela et al., 2017). In continuation to precautionary measures for the community and wildlife, it was further recommended to have trained firefighters to manage before it gets out of control.

#### **Natural disasters:**

The term Natural Disaster has been discussed two times (02) in the textbook of Social Studies grade VIII, the text was directly used in terms of providing knowledge about natural disasters.

*“Natural disasters are natural occurrences that cause significant damage to people and property. Every year, natural disasters kill thousands of people and destroy property worth billions of dollars”*

(Social Studies VIII grade, Chapter 04, Page 51)

The context in which the text is discussed is accepted as a natural phenomenon that causes damage to property and human lives, the text second time was discussed in context to estimate the cost of losses due to natural disasters every year thousands of people die and property that cost billions of dollars are destroyed. Over the past ten years, natural disasters have killed an average of 0.1% of people worldwide. However, this ranged from 0.01% to 0.4% of all deaths and was highly variable to high-impact events (Ritchie & Roser, 2014).

**Environmental Hazards:** An environmental hazard is a substance, state, or event that has the potential to endanger the natural environment and/or harm people's health (Iderawumi, 2019). The term pollution in the textbook of social studies grade VIII was discussed under the broader concept of environmental hazards. The term related to

environmental hazards were discussed thirteen (13) times in the textbook of social studies

**Desertification:**

The term desertification is discussed two times in the textbook of Social Studies grade VIII. The context of the text focus on knowledge about desertification and the prevention measures to avoid desertification.

*‘Desertification is the spread of deserts. Caused by drought; residential development and industrialization. To prevent desertification, restrictions on tree cutting should be imposed’*

(Social Studies VIII grade, Chapter 04, Pages 54-55)

The text is the first time discussed to develop the knowledge of students on the process of desertification and what the term means, Drought, industrialization, and residential development were mentioned as causes of desertification. Numerous scientists have asserted that human activity is primarily to blame for desertification, and that surface erodibility and atmospheric erosivity could have an impact on the dynamics of the process(Thomas & Leason, 2005). The second time the text discussed about the prohibition of cutting trees to prevent desertification. The context of the text provides knowledge of the concept, its, causes, and the measure that prevent desertification.

**Pollution:** The term pollution was discussed eleven (11) times in the textbook of Social Science grade VIII, the context of the text is discussed below. Environmental pollution is not a recent phenomenon, but it continues to be the biggest threat to humanity and the main factor in environmental morbidity and mortality. Urbanization, industrialization, mining, and exploration are among the human activities that have had the greatest impact on global environmental pollution (Ukaogo et al., 2020).

*‘Pollution is defined as any change in the physical, chemical, or biological properties of air, water, and soil that can directly or indirectly affect human health, survival, or activities’*

(Social Studies VIII grade, Chapter 04, Page 51)

The text Pollution was discussed in context to a process in which the physical-chemical or biological properties of water, air, and soil have been changed, these changes hurt Human health, human survival, and human activities.

**Air pollution:** The term Air pollution was placed under the broader term of Environmental Hazards and pollution and discussed three times in the textbook. One of the major modern killers is air pollution. 64 million deaths were attributed to air pollution in 2015, including 28 million from indoor air pollution and 42 million from smog (Prüss-Ustün et al., 2017).

*‘Any physical or chemical change either man-made or natural in the composition of clean air is air pollution’*

(Social Studies VIII grade, Chapter 05, Page 67)

The term Air pollution was used to give an understanding of the term Air Pollution; the context explains that the physical or chemical change either Man-made or natural in the composition of air causes pollution in the air. Pollution is defined as almost any human activity that degrades or depreciates the quality of the natural environment (Prüss-Ustün et al., 2017).

*‘Wildfires caused by lightning, wind erosion of soil, sand particles in the air, and volcanic eruptions are all natural sources of air pollution. The use of carbon fuels in power plants, industries, and automobiles contributes to air pollution’*

(Social Studies VIII grade, Chapter 05, Page 67)

The second time the word Air pollution was used to explain the causes of air pollution either natural or human-made. In context fire, Soil erosion, dust storms, and volcanic eruption was discussed as natural causes of air pollution. Industrial, automobile, and fuel plants were identified as man-made activities to cause air pollution. When gases, dust particles, fumes (or smoke), or odors are introduced into the atmosphere in a way that is harmful to humans, animals, and plants, this is referred to as air pollution (Choudhary & Garg, 2013).

*‘Many hazardous effects of air pollution on human health have been identified; air pollution can seriously harm the human respiratory system. It is one of the causes of many dangerous diseases such as lung cancer, tuberculosis, pneumonia, asthma, and breathing difficulties’*

(Social Studies VIII grade, Chapter 05, Page 67)

The text was used a third time in context to share the effects of air pollution on human health, as per context air pollution cause respiratory diseases. air pollution causes pneumonia, asthma, beating difficulties, and lung cancer. According to the WHO, air pollution is a significant risk factor for a variety of health conditions, including respiratory infections, heart disease, and lung cancer. Air pollution's health effects can

include difficulty breathing, wheezing, coughing, asthma, and worsening of pre-existing respiratory and cardiac conditions (Choudhary & Garg, 2013). Air pollution was the fifth-leading risk factor for both sexes, accounting for a significant portion of DALYs associated with cardiovascular and circulatory diseases, as well as lower respiratory infections, diarrheal diseases, and other common infectious diseases. Malnutrition, which was the leading global risk factor in 1990, was the second-leading risk factor for women and the sixth-leading risk factor for men in 2015 (Collaborators, 2015).

### **Water Pollution:**

The term water pollution was used a single time in the textbook of social studies grade VIII. The text Water Pollution was used in context to discuss the composition of water and the changes that cause water pollution. Water is considered polluted when certain substances or conditions are present to such an extent that it cannot be used for a specific purpose. Water pollution is the presence of excessive amounts of pollutants in water, that make it no longer appropriate for drinking, bathing, cooking, or other uses(Owa, 2013).

*“Water pollution is defined as a change in freshwater quality, any change in physical characteristics such as colour, taste, or odour. or presence of chemical characteristics such as salt and mineral composition”*

(Social Studies VIII grade, Chapter 05, Pages 70-72)

The term Water pollution was discussed to develop an understanding of the concept that makes water polluted, these pollutants include chemical or physical substances visible in colour, taste, odour, or change in chemical composition. Any chemical substance that is present in high concentrations becomes a pollutant, causing negative effects (Harrison, 2001).

### **Soil Pollution:**

The text soil pollution was discussed four (04) times in the textbook of Social Studies grade VIII, "Soil pollution" is defined as the presence of a chemical or substance that is out of place and/or at a higher-than-normal concentration that harms any non-targeted organism (ITPS, 2015).

*‘Soil pollution is divided into two types: soil pollution, which is prevalent in rural areas, and solid waste pollution, which is prevalent in urban areas. Soil pollution causes agricultural land to become infertile and arable. Soil pollution is caused by a variety of factors,*

*including water logging, the harmful effects of fertilizers and pesticides, and salinity''*

The term soil pollution was first time used to associate the term with the linked concept of solid-waste pollution. The context explains that soil pollution is having two types one is soil pollution and the second one is solid waste pollution. Solid waste pollution contaminates the soil or causes soil pollution. Leachate from a solid waste dump has a significant impact on the chemical and soil mechanics properties of the soil. Leachate can alter soil properties and significantly alter soil behavior (Ukpong & Agunwamba, 2011). The term was used a second time to link soil pollution with soil infertility. The context discusses the effect of soil pollution on agricultural land that make it infertile. Industrialization, wars, mining, and agricultural intensification have all left a legacy of contaminated soils around the world (Bundschuh et al., 2012). The text further discussed different causes of soil pollution, which include water logging, salinity fertilizers and pesticides. Certain pollutants may also cause nutrient imbalances and soil acidification, which are major issues in many parts of the world, according to the Status of the World's Soil Resources Report (ITPS, 2015). According to Oberemok et al. (2015), pesticide use in agricultural production will be 2.7 times higher in 2050 than in 2000, posing an increasing risk to human health for coming generations. Waterlogging and salinity are raise of sodium and calcium compounds that disturb the chemical composition of sail and affect the fertility of the soil. Waterlogging in high salinity causes increased concentration levels of Na<sup>+</sup> and/or Cl in higher plant shoots (or leaves). waterlogging (hypoxia) caused an average 228% increase in sodium concentrations and a 135% increase in chloride concentrations in the shoot tissues (Barrett-Lennard, 2003).

*''Waste disposal, which is disposed from rural, urban, and commercial activities, pollutes the environment and also contributes to soil pollution. The discharge of chemical waste by industries pollutes the soil''*

The term third time discussed in context to the waste disposal concept, the waste of rural, urban, and industrial activities pollutes the environment as well as soil. industrial waste discharge in the shape of chemicals pollutes the soil. The term " waste disposal" refers to non-liquid/liquid waste generated by domestic, trade, commercial, and public services. It is made up of numerous different materials. Dust, chemicals, food waste, paper, metal, plastic, or glass packaging, discarded clothing, garden waste, pathological waste, hazardous waste, and radioactive waste (Modak et al., 2011).

*‘Solid waste collection and disposal has become a major issue. Because of this issue, soil pollution is increasing in all major cities around the world’*

(Social Studies VIII grade, Chapter 05, pages 73-75)

The term soil pollution was fourth time discussed with the relevancy of the solid waste collection and disposal issue, the disposal of solid waste is an issue in major cities of the world. Mismanaging solid waste collection cause soil pollution. Different countries produce different types of solid waste. The organic matter content of solid waste in developing countries is significantly higher than that of waste in developed countries. However, waste characteristics vary slightly across geographical regions and seasons; even so, the influence of seasonal variation is negligible (Alamgir & Ahsan, 2007).

### **Noise Pollution:**

The term Noise pollution was used three times in the textbook of Social Studies Grade VIII. At the 1972 World Environment Congress in Stockholm, noise was recognized as an important pollutant (Buss, 2007). Following that, the World Health Organization issued a slew of reports based on research from around the world that demonstrated the negative impact of noise pollution on human health (WHO, 2009, 2011).

*‘Because noise travels through the air, it is considered part of air pollution. The noise of industrial machinery, traffic, aircraft landing, and takeoff, and loud music are all major sources of noise pollution’*

The term Noise pollution was discussed first time in context to associate the term noise pollution with air pollution, as the waves of the noise transfer through Air. Noise, which is defined as "unwanted sound," is viewed as a stressor and annoyance in the environment (Stansfeld & Matheson, 2003). The term was a second time used in context to develop the understanding that the noise of traffic, machinery, aircraft landing, takeoff, and land oud music all are related to noise pollution. The most significant source of noise in cities, both temporally and spatially, is known to be vehicular traffic (Morillas et al., 2018).

*‘When a person is exposed to high levels of noise pollution over time, his eardrums may be damaged. According to the American Speech and Hearing Association, one out of every ten Americans who live or work in a noise-polluted environment loses his hearing every day’*

(Social Studies VIII grade, Chapter 05, Page 75-77)

The term was the third time used in context to the consequences of Noise pollution on health. the context explains that a person's high exposure to noise pollution over time damages the eardrums. A lifetime of exposure to noise between 85 and 90 dBA, especially in industrial settings, can cause a gradual loss of hearing with an increase in the threshold of hearing sensitivity (Stansfeld & Matheson, 2003).further the consequences of noise pollution were explained, association developed with the finding of the study that according to American speech and hearing association, out of every 10<sup>th</sup> American who is exposed to noise pollution loses her hearing ability. Health and quality of life are impacted by hearing loss. An ageing population and increased noise exposure may be contributing to an increase in hearing loss prevalence. In the US, adults' hearing loss is more common than previously reported (Agrawal et al., 2008).

**Green House Gases:** The term greenhouse gases were used two times in the textbook of social studies grade VIII. The text was used in context to provide knowledge about greenhouse gases and the effect of greenhouse gases on climate change.

*“The atmosphere contains water vapour, carbon dioxide, and trace amounts of other gases such as methane, nitrous oxide, and chlorofluorocarbons, which are used in aerosol sprays and refrigeration. These gases are known as greenhouse gases, and they play a key role in the warming of the Earth's atmosphere”*

(Social Studies VIII grade, Chapter 05, Page 77)

The context was the first time used to develop the overall concept of greenhouse gasses. Context state that the atmosphere contains carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons(CFC) which are used in refrigeration and aerosol sprays. These gases are called greenhouse gases which play a role in global warming. The majority of today's energy needs are met by burning fossil fuels, which produce enormous volumes of greenhouse gases (GHG) (Ideris et al., 2021). Carbon dioxide (CO<sub>2</sub>) and methane(CH<sub>4</sub>) make up the majority of greenhouse gases, GHG is gases that retain heat in the atmosphere and have a large impact on temperature rise and global warming (Ma et al., 2021).

*“An increase in the number of greenhouse gases prolongs the heating of the atmosphere, causing an increase in the earth's average temperature. This is referred to as global warming. The global average temperature rises as a result of global warming”*

(Social Studies VIII grade, Chapter 05, Page 79)

The term greenhouse gases (GHG) were second time discussed in context to have an understanding of the effects of greenhouse gases on global warming. The context explains the relationship between GNG and global warming. context explains that the increase in the number of GNG prolongs the retention of heat in the atmosphere which cause an increase in the earth's overall temperature that results in global warming.

The greenhouse effect plays a crucial role in keeping the Earth warm Because it prevents some of the planet's heat from escaping the atmosphere and into space. In fact, without the greenhouse effect, Earth's average global temperature would be much lower, making it impossible for life as we know it to exist (UKMO, 2011). The sun's energy interacts with greenhouse gases found in the Earth's atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases, to produce the greenhouse effect. The greenhouse effect is caused by these gases' capacity to absorb heat (RS, 2010).

**Disaster:** The term disaster was discussed a signal time in the textbook of social studies grade VIII. The text disaster and the context of the disaster are directly related to the concept of EiE and DRR.

*‘‘A disaster occurs when it causes property damage, to houses, farmland, corps, and human life’’*

The context of the text is explaining the situation that calls disaster when damages happen to human life, property and livestock and beyond the capacity to handle a disaster. an event that seriously impairs society's ability to function and results in significant losses to people, property, or the environment that outweigh what the affected society can reasonably expect to recover using only its resources (Shaluf, 2007).

**Geographical Information System (GIS):** The term GIS was used a single time in the textbook of Social studies in context to DRR-related terminologies and linked with Education in emergencies.

*‘‘It's a computer-based technology used for spatial analysis of geographical problems. GIS can be used to collect details of different locations including natural hazards like earthquakes, land sliding, storms etc’’*

(Social Studies VIII grade, Chapter 10, Page 144)

The term GIS was used in context to provide knowledge about the modern technologies which are helpful to remotely monitor the location on the earth, The GIS provides information and data regarding any disaster that including, flooding, earthquake,



storms, tsunami landslides, etc. The text and the context were related to knowledge sharing about computer-based technology which helps to observe the live location and share and store images of any disaster-hit area. The Earth Observation System (EOS), also known as Remote Sensing (RE), and GIS, offers more accurate data and greatly aids professionals in disaster management. With this technology, it is simple to quickly obtain homogeneous data covering the entire globe. Remote sensing is used to locate areas for storing temporary housing, identify potential escape routes, and gauge the extent of damage that was sustained during the disaster (Krishnamoorthi, 2016).

The textbook of social studies grade VIII, responds the disaster risk reduction in a very comprehensive way. Different hazards and disasters include geographical, Metrological, hydrological, climatological, and environmental hazards with a history of disasters that happened in Pakistan were discussed in detail. That detail includes the preventive measures required during the disasters discussed. The aspects of environmental hazards were also emphasized. The feature of pollution its types and its consequences of pollution were discussed in detail. Other DRR-related terminologies including GIS, Green House Gases, disasters, and natural disasters were also discussed directly in the context of DRR. The most detailed discussed topic was related to geographical hazards which were discussed seventeen times in the textbook directly, preventively, and as a cause of other possible risks of hazards.

### **Discussion and Recommendations:**

The textbook geography grade VI demonstrate knowledge and understanding of geographical hazards, these hazards include earthquake and volcanism. The content of the textbook demonstrates the causes of the earthquake and shared an example of the Japan earthquake where the disaster took around 15 thousand lives and the process of volcanism. Other defined terminologies were not addressed in the textbook. The content educates the students regarding the cause of earthquakes as a hazard, that can cause disaster and the process of volcanism. Knowing something with a high degree of familiarity through experience, correlation, or contact is referred to as knowledge (Alcoff et al., 2006). By educating about the causes of hazards, and consequences of the disaster, a better understanding of mitigation and prevention can be installed in an individual. By educating about disasters, disaster management can be better understood. The key to efficiently managing disasters is to teach students about disaster management in schools (Pathirage et al., 2012). In the textbook of social studies grade VI, the focus was to give the students an insight into what conditions cause earthquakes and earthquakes are dangerous. secondly, the concept of volcanism was discussed

indirectly, which gives an insight that the process of erupting hot magma may cause danger and it also drives the student to compare knowledge with visual examples seen on the ground. The content presented in the textbook was not related to Disaster management, however, the text and context develop perceptions and disaster risk information about disastrous consequences. The characteristics of the earth's layers, the process of tectonism and its effects on life, the process of volcanism and its effects on life, and the seismic process and its effects on life, are just a few examples of the geological phenomena that students must learn about to understand the dynamics of the lithosphere and its impact on life. As a result, one aspect of geography analysis is how people respond to risks to their safety based on spatial, ecological, and complex-regional factors (Harriss et al., 1978).

The Social Studies textbook for Grade VII contains DRR-relevant content that is pertinent to knowledge, prevention and the effects of these disasters. It is critical in disaster management to provide students with disaster knowledge (Adiyoso, 2018). Disaster Knowledge and disaster prevention lead to disaster management. A comprehensive understanding of the disaster, Prevention its effects, and associated potential hazards around disaster-hit areas are related to Disaster management. An extensive analysis of the impacts produced and their cost is one of the crucial components of crisis management. The ability to implement effective holistic management through the creation of preventive measures and response programs depends on an accurate assessment of the impacts, which can help to lessen the severity or even prevent impacts in the event of future crises (Laugé et al., 2013). Less of the identified DRR-related terminology was used to investigate DRR responsiveness in the textbook, a continuation of the analysis of the Geography curriculum as compared to the previous grade with more emphasis on geographical, hydrological, metrological and climatological hazards. So the DRR responsiveness was more broadly focused in the grade VII textbook of Geography as compared to the grade VI textbook. That means the vertical alignment of the content related to DRR/DRM was arranged in a sequence carrying primary-level to secondary-level content in grade VI and Grade VII. Vertical alignment is a process as well as an outcome, with the result being a comprehensive curriculum that offers learners a coherent sequence of content. Vertical alignment ensures the introduction and reinforcement of content standards as well as reading skills and strategies (Fisher, 2008). From the analysis, it was also found that the content of geography grade VII is more focused on the causes and effects of disasters. A comprehensive review of the impacts generated and their associated costs is an important aspect of crisis management. The analysis of cost and effect leads to disaster information and mitigation. Laugé et al. (2013)verified the ability to carry out efficient

holistic management through the development of preventive measures and response programs is dependent on accurate impact estimation, which helps to mitigate or even avoid impacts in the face of future crises.

The social studies textbook for grades VIII comprehensively responds to DRR. Natural hazards and catastrophic events were discussed in detail, these catastrophes include geographical, metrological, hydrological, climatological, and environmental. The content includes the precautions needed during disaster events. The other possible risks in the environment after occurring a disaster were also highlighted. Apart from natural disasters, environmental hazards were also discussed in detail to point out future risks for the population that can cause a big disaster. the analysis seems that the prevention and mitigation were addressed in parallel. prevention is a defensive measure to avoid hazards and mitigation is a strategy to reduce the severity of human and assets loss. The content of the textbook focused on prevention and mitigation. Some DRR practitioners prefer the term Prevention over Mitigation. Mitigation can be derived from the term Prevention. Mitigation entails lessening the severity of the disaster's human and material damage. The goal of prevention is to avoid disasters or emergencies caused by human actions or natural phenomena (WHO/EHA, 1998). The disaster management model serves as the foundation for disaster management planning. This model has four stages: reduction, preparedness, response, and recovery (Joyce et al., 2009). mitigation and prevention are somehow limited to the reduction and to some extent to preparedness in the disaster management model no content related to response and recovery where shared in the textbook elementary grade. however, disaster prevention has a vibrant role in disaster response. Preventive measures such as changes in building processes or land use planning could be implemented through risk assessment. During the planning phase, an analysis of the effects of previous disasters leads to the improvement of response programs by assigning priorities, allocating resources, and training responders. All previously developed programs and training improve managers' learning about the consequences of a natural disaster over time, reducing the generation of indirect impacts (Laugé et al., 2013). A coherent vertical alignment of content related to DRR was observed in elementary grades textbooks. The arrangement of content related to DRR was from basic to advance starting from knowledge to understanding and moving forward with prevention and mitigation in upper elementary grades of geography textbooks. Vertical alignment ensures that instruction is focused on the point where content standards and student needs converge. Redundant content is less common in curricula with strong vertical alignment, and the curriculum arrangement is demanding and difficult (Fisher, 2008).

Pakistan is very prone to disasters, Schools must play a vital role in Knowledge sharing, prevention and precautionary measures, and mitigation strategies through the curriculum. Education about disaster risk empowers kids and aids in raising public awareness of the issue. The curriculum alignment must have a space for DRR and DRM-related content vertically and horizontally together. Since long-term disaster reduction culture development can be significantly aided by disaster education. Different researchers have acknowledged the significance of disaster education at the school level.

### **Conclusion:**

The study's main goal was to examine how responsive the elementary-grade geography curriculum was to DRR. The elementary school textbook alignment demonstrates how knowledge, mitigation, and prevention skills are gradually improved throughout each textbook level. Geophysical, hydrological, metrological, climatological, and environmental risks and hazards were discussed, along with their causes and effects. However, the policy suggests including content in textbooks on trauma management and disaster response that was absent from some textbooks. However, the information in the textbook was an expansion of information on risk management and disaster prevention.

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