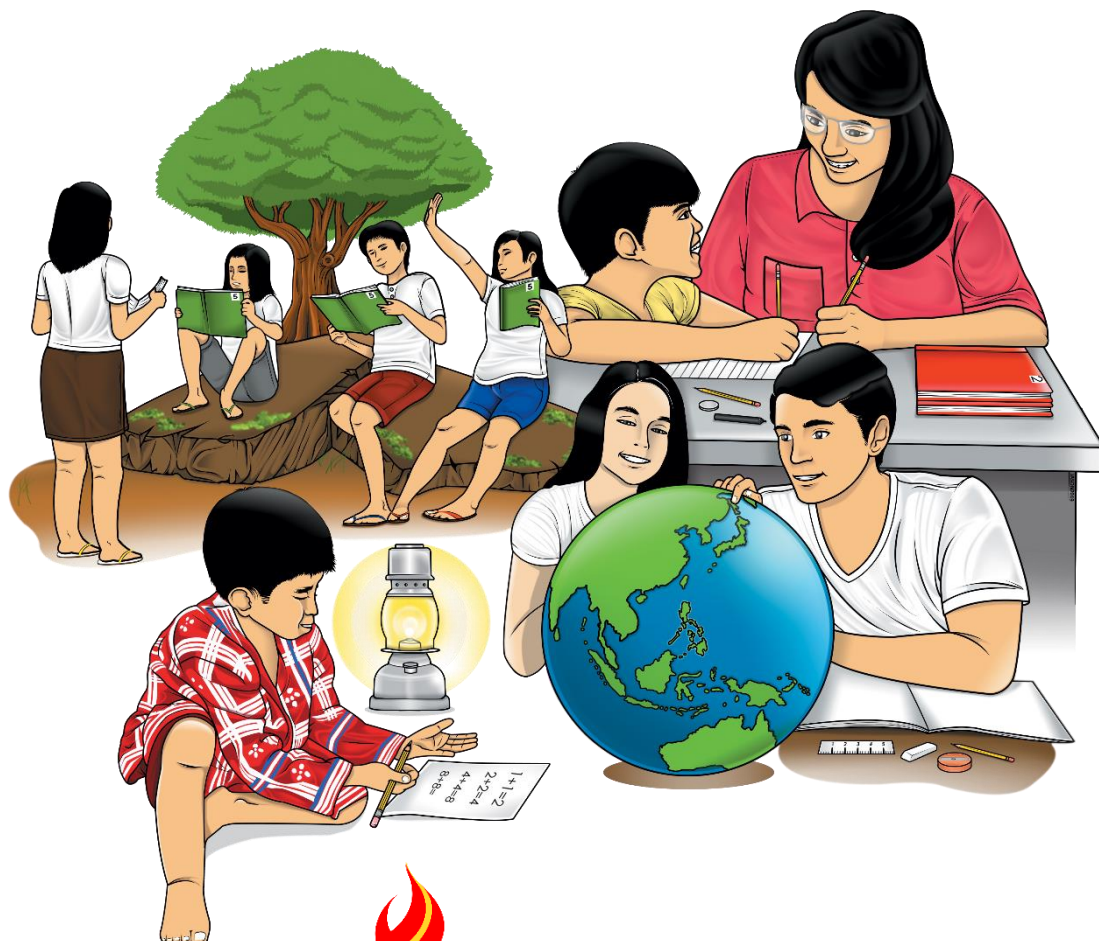


# Disaster Readiness and Risk Reduction

## Quarter 1 – Module 2: Risk Factors Underlying Disasters



**Disaster Readiness and Risk Reduction  
Alternative Delivery Mode  
Quarter 1 – Module 2: Risk Factors Underlying Disasters  
First Edition, 2021**

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Senior High School

# **Disaster Readiness and Risk Reduction**

## **Quarter 1 – Module 2: Risk Factors Underlying Disasters**

## **Introductory Message**

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

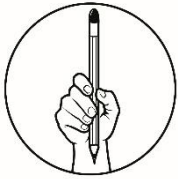


## ***What I Need to Know***

This module is intended to help you understand the risk factors underlying disasters. This course focuses on the application of scientific knowledge and the solution of practical problems in a physical environment.

After going through this module, you are expected to:

1. identify the risk factors underlying disasters.
2. describe each Risk factors underlying disasters.
3. utilize the gained knowledge in real life situations to avoid harm and assure safety.
4. appreciate the importance of understanding the risk factors underlying disasters to mitigate the effects of disaster and practice mitigation measures as early as necessary.



## ***What I Know***

**Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.**

1. Which of the following is the process or condition, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity?
  - a. risk factor
  - b. disaster risk
  - c. natural hazard
  - d. man-made hazard
2. Which of the following is NOT an element which causes disaster?
  - a. exposure
  - b. hazard
  - c. risk
  - d. vulnerability

3. Which of the following **BEST** describes hazard?
  - a. loss of life or injury naturally
  - b. a phenomenon or human activity
  - c. potentially damaging physical event
  - d. reduction of vulnerability and exposure
  
4. Which of the following risk factors **BEST** describes the cause of COVID-19 pandemic?
  - a. climate change
  - b. weak governance
  - c. globalized economic development
  - d. poorly- planned and managed urban development
  
5. It refers to the changes that can be attributed “directly or indirectly to human activity altering the composition of the global atmosphere and additionally to the natural climate variability observed over comparable periods of time”?
  - a. deforestation
  - b. climate change
  - c. global warming
  - d. carbon footprint
  
6. How will reduction of the level of vulnerability and exposure be possible?
  - a. proper knowledge on disaster risk
  - b. potentially damaging physical even
  - c. increase the susceptibility of a community to the impact of hazard
  - d. by keeping people and property as distant as possible from hazards
  
7. Which of the following risk factors affect with inequality?
  - a. poverty
  - b. climate change
  - c. weak governance
  - d. globalized economic development
  
8. Unwillingness to assume their roles and responsibilities in governing disaster risk unit, falls under which of the following risk factors?
  - a. climate change
  - b. weak governance
  - c. poverty and inequality
  - d. environmental degradation
  
9. Which among the groups suffer more adverse effects when an earthquake causing disaster occurs?
  - a. men and women
  - b. children and women
  - c. old persons and women
  - d. old persons and children

10. The occurrence of landslides in the Philippines is increasing. This kind of disaster will fall under which of the following risks?
  - a. poverty and inequality
  - b. climate change and weak governance
  - c. climate change and environmental degradation
  - d. climate change and globalized economic development
  
11. The ages below are average years ranges affected by specific situations happening as a disaster occurs. Which of the following age ranges are “Most Stressed-Out” after a disaster according to Asian Disaster Preparedness Center (ADPC)?
  - a. 16-20
  - b. 20-30
  - c. 30-40
  - d. 40-60
  
12. Which of the following risk factors is the result in an increased polarization between the rich and poor on a global scale?
  - a. climate change
  - b. poverty and inequality
  - c. environmental degradation
  - d. globalized economic development
  
13. Which of the following is **NOT** a contributor to the worst outcomes when a disaster happened?
  - a. displacement
  - b. can handle stress
  - c. death of someone close
  - d. massive loss of property
  
14. Who among the following groups of people are more likely to live in hazard-exposed areas and are less able to invest in risk-reducing measures based on most studies in Asian Disaster Preparedness Center (ADPC)?
  - a. middle class
  - b. senior citizens
  - c. young professionals
  - d. impoverished people
  
15. It is a risk factor that is both a driver and a consequence of disasters, reducing the capacity of the environment to meet social and ecological needs, what is it?
  - a. climate change
  - b. weak governance
  - c. poverty and inequality
  - d. environmental degradation

## Lesson

# 1

# Differentiating Risk Factors Underlying Disaster

In this module, the learner will understand that disaster can bring about many devastating effects. Upon identifying the risk factors underlying disaster, this will provide ideas to mitigate the effects of disasters that can lead to death, destruction of infrastructures, loss of livelihoods, and even non-physical events like emotional and psychological aspects.



## What's In

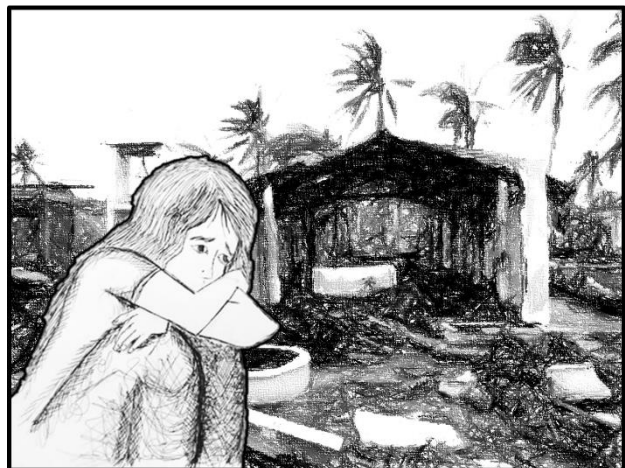
### At Risk...

Disaster can affect everyone. It does not discriminate between and among social classes, gender, creed, race, and nationality. But certain risk factors put those affected in a position where they will have graver or longer-lasting post-disaster stress reactions. These aggravating factors contribute to evident differences in the stress reactions of certain individuals with certain characteristics.

### Activity 1.1:

**Direction:** Read the scenario below. Based on your understanding of disaster from the previous module, enumerate or list down the risks that are reflected from the text.

Gina, an 18-year-old resident of Tacloban City, just got laid off from her job as a sales clerk in a medium-sized hardware store. She and her siblings could barely survive each day with their limited resources. Then Typhoon Yolanda struck, it killed her 2 younger sisters. Their home was destroyed by the storm surge. In her barangay alone, 2000 residents were killed, including her childhood friends and former playmates.



Composite Art Background:  
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**Identified Risks:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

4. \_\_\_\_\_
5. \_\_\_\_\_



**What's New**

**Activity 1.2 Identifying Risk Factors**

**Direction:** Read the news article about an earthquake. After you have read the article, answer the guide questions.

**6.4-Magnitude Earthquake Shakes Southern Philippines**

MANILA • A strong 6.4-magnitude earthquake shook the southern Philippines yesterday, sending frightened residents fleeing from buildings, officials and eyewitnesses said.

The quake struck off the coast of the southern town of Manay at 3.16 pm at a depth of 14km, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) said in a statement.

While there were no immediate reports of serious destruction, the institute said it expects the earthquake to have caused some damage.

A lot of people ran from their homes because a lot of items were falling inside," The Philippine Institute of Volcanology and Seismology (PHIVOLCS) is a service institute of the Department of Science and Technology (DOST) that is principally mandated to mitigate disasters that may arise from volcanic eruptions, earthquakes, tsunami and other related geotectonic phenomena. PHIVOLCS science researcher John Deximo said.

The Philippines lies on the so-called Ring of Fire, a vast Pacific Ocean region where many earthquakes and volcanic eruptions occur.

At least two people were killed and scores injured when a 6.5-magnitude quake struck the central Philippines in July last year.

The most recent major quake to hit the Philippines was in 2013, when a 7.1-magnitude quake left more than 220 people dead and destroyed historic churches in the central islands.

France-Presse, Agence, "6.4-Magnitude Earthquake Shakes Southern Philippines"THE STRAIT TIMES ASIA, 09 September 2018, SGT <https://www.straitstimes.com/asia/se-asia/64-magnitude-earthquake-shakes-southern-philippines>

**Guide Questions:**

1. What risk/s can you identify from the news article?

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2. What do you think are the factors that affect the disaster risks from the preceding article?

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## ***What is It***

### **RISK FACTORS**

Disaster risk as defined in the first module, has three important elements such as:

1. Exposure - the “elements at risk from a natural or man-made hazard event (Quebral, 2016).

2. Hazard-a potentially dangerous physical occurrence, phenomenon or human activity that may result in loss of life or injury, property damage, social and economic disruption, or environmental degradation.

3. Vulnerability - the condition determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazard (Food and Agriculture Organization of the United nation, FAO 2008).

Reduction of the level of vulnerability and exposure is possible by keeping people and property as distant as possible from hazards. We can not avoid natural events from occurring, but we can concentrate on addressing the reduction of risk and exposure by determining the factors causing disasters.

Risk Factors are processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity.

The following are also taken into consideration when risk factors underlying disaster are involved:

- **Severity of exposure** - which measures those who experience disaster first-hand which has the highest risk of developing future mental problems, followed by those in contact with the victims such as rescue workers and

health care practitioners and the lowest risk are those most distant like those who have awareness of the disaster only through news.

- **Gender and Family** - the female gender suffers more adverse effects. This worsens when children are present at home. Marital relationships are placed under strain.
- **Age** - adults in the age range of 40-60 are more stressed after disasters but in general, children exhibit more stress after disasters than adults do.

Magbool, Irfan, Asian Disaster Preparedness Center, ADPC, 31 December 2012, <https://www.adpc.net/igo/contents/adpcpage.asp?pid=1266&dep=RIG>

- **Economic status of country** - evidence indicates that severe mental problems resulting from disasters are more prevalent in developing countries like the Philippines. Furthermore, it has been observed that natural disasters tend to have more adverse effects in developing countries than do man-caused disasters in developed countries.

Magbool, Irfan, Asian Disaster Preparedness Center, ADPC, 31 December 2012, <https://www.adpc.net/igo/contents/adpcpage.asp?pid=1266&dep=RIG>

### **Factors which underlie disasters:**

1. **Climate Change** - can increase disaster risk in a variety of ways – by altering the frequency and intensity of hazards events, affecting vulnerability to hazards, and changing exposure patterns. For most people, the expression “climate change” means the alteration of the world’s climate that we humans are causing such as burning of fossil fuels, deforestation and other practices that increase the carbon footprint and concentration of greenhouse gases in the atmosphere. This is in line with the official definition by the United Nations Framework Convention on Climate Change (UNFCCC) that climate change is the change that can be attributed “directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods”

International Strategy for Disaster Reduction, “Climate Change and Disaster Risk Reduction”, September 2008

[https://www.wmo.int/pages/prog/dra/vcp/documents/7607\\_Climate-Change-DRR.pdf](https://www.wmo.int/pages/prog/dra/vcp/documents/7607_Climate-Change-DRR.pdf)

2. **Environmental Degradation** - changes to the environment can influence the frequency and intensity of hazards, as well as our exposure and vulnerability to these hazards. For instance, deforestation of slopes often leads to an increase in landslide hazard and removal of mangroves can increase the damage caused by storm surges (UNISDR, 2009b). It is both a driver and consequence of disasters, reducing the capacity of the environment to meet social and ecological needs. Over consumption of natural resources results in environmental degradation, reducing the effectiveness of essential ecosystem services, such as the mitigation of floods and landslides. This

leads to increased risk from disasters, and in turn, natural hazards can further degrade the environment.

Prevention Web. Editor, “Environmental Degradation”, Prevention Web. The Knowledge Platform for Disaster Risk Reduction, 12 November 2015  
<https://www.preventionweb.net/risk/environmental-degradation>

**3. Globalized Economic Development** - It results in an increased polarization between the rich and poor on a global scale. Currently increasing the exposure of assets in hazard prone areas, globalized economic development provides an opportunity to build resilience if effectively managed. By participating in risk-sensitive development strategies such as investing in protective infrastructure, environmental management, and upgrading informal settlements, risk can be reduced. Dominance and increase of wealth in certain regions and cities are expected to have increased hazard exposure (Gencer, 2013).

Prevention Web. Editor, “Globalized Economic Development”, Prevention Web. The Knowledge Platform for Disaster Risk Reduction, 12 November 2015  
<https://www.preventionweb.net/risk/globalized-economic-development>

**4. Poverty and Inequality** - Impoverished people are more likely to live in hazard-exposed areas and are less able to invest in risk-reducing measures. The lack of access to insurance and social protection means that people in poverty are often forced to use their already limited assets to buffer disaster losses, which drives them into further poverty. Poverty is therefore both a cause and consequence of disaster risk (Wisner et al., 2004), particularly extensive risk, with drought being the hazard most closely associated with poverty (Shepard et al., 2013). The impact of disasters on the poor can, in addition to loss of life, injury and damage, cause a total loss of livelihoods, displacement, poor health, food insecurity, among other consequences. Vulnerability is not simply about poverty, but extensive research over the past 30 years has revealed that it is generally the poor who tend to suffer worst from disasters (DFID, 2004; Twigg, 2004; Wisner et al., 2004; UNISDR, 2009b).

Prevention Web. Editor, “Poverty and inequality”, Prevention Web. The Knowledge Platform for Disaster Risk Reduction, 12 November 2015  
<https://www.preventionweb.net/risk/poverty-inequality>

**5. Poorly planned and Managed Urban Development** - A new wave of urbanization is unfolding in hazard-exposed countries and with it, new opportunities for resilient investment emerge. People, poverty, and disaster risk are increasingly concentrated in cities. The growing rate of urbanization and the increase in population density (in cities) can lead to creation of risk, especially when urbanization is rapid, poorly planned and occurring in a context of widespread poverty. Growing concentrations

of people and economic activities in many cities are seen to overlap with areas of high-risk exposure.

Prevention Web editor, "Poorly planned and managed urban development ", Prevention Web. The Knowledge Platform for Disaster Risk Reduction, 12 November 2015  
<https://www.preventionweb.net/risk/poorly-planned-managed-urban-development>

**6. Weak Governance** - weak governance zones are investment environments in which public sector actors are unable or unwilling to assume their roles and responsibilities in protecting rights, providing basic services and public services. Disaster risk is disproportionately concentrated in lower-income countries with weak governance (UNISDR, 2015a). Disaster risk governance refers to the specific arrangements that societies put in place to manage their disaster risk (UNISDR, 2011a; UNDP, 2013a) within a broader context of risk governance (Renn, 2008 in UNISDR, 2015a). This reflects how risk is valued against a backdrop of broader social and economic concerns (Holley et al., 2011).

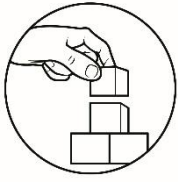
Prevention Web. Editor, "Prevention Web. The Knowledge Platform for Disaster Risk Reduction. Nov. 12, 2015 <https://www.preventionweb.net/risk/weak-governance>

**7. Geographical Location** - The Philippines is one of the most vulnerable countries in the world to natural disasters. The country's location makes it vulnerable to storms that cause flooding, mudslides, and typhoons. Furthermore, the Philippines is vulnerable to tsunamis due to the presence of offshore trenches such as the Manila Trench. Regrettably, the list does not stop there. The Philippines also sits above the Ring of Fire, a path that runs through the Pacific Ocean basin.

<https://borgenproject.org/natural-disasters-in-the-philippines/>

Certain factors are related to a survivor's background and recovery is hampered if survivors: were not functioning well before the disaster; have no experience dealing with disasters; must deal with other stressors after the disaster; have low self-esteem; feel uncared for by others; think they exercise little control over what happens to them; and unable to manage stress.

More factors contributory to worse outcomes: death of someone close; injury to self or family member; life threat; panic, horror, or similar feelings; separation from family; massive loss of property; and displacement.



## What's More

### Activity 1.3: What is the Risk Factor?

**Direction:** Analyze the given situation by identifying the correct risk factor. Write only the letter that corresponds to your answer. To facilitate your task, accomplish the given table below:

- A. **Climate Change**
- B. **Environmental Degradation**
- C. **Globalized Economic Development**
- D. **Poverty and Inequality**
- E. **Poorly planned and Managed Urban Development**
- F. **Weak Governance**
- G. **Geographical Location**

Situation	Factor Underlying Disaster
unwillingness to assume their roles and responsibilities in governing disaster risk department	
rising sea levels	
cities located in low-altitude estuaries such as Marikina City, Philippines are exposed to sea-level rise and flooding.	
houses are built with lightweight materials	
effects in developing countries	
deforestation that can lead to landslide	
global Warming	
garbage slide killed that over 200 people in an informal settlement in Manila, the Philippines,	
fragmented responsibilities for drought risk management	

**Stop and Reflect**

Now review your previous activities 1.3. Do you think that the given ideas/concepts are clear for you to differentiate risk factors underlying disasters? Agree or Disagree?



***What I Have Learned***

**Exit Ticket**

Have you learned so much from this module? What are the three things that you learned today? What are the two things you found interesting?

3 Things I learned Today 1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

2 Things I Found Interesting 1. \_\_\_\_\_

2. \_\_\_\_\_

1 Question I have 1. \_\_\_\_\_

Now that you have already learned and understand the lessons, focusing on risk factors underlying disasters. It is time to work to demonstrate your learning gains. Are you ready? Sure, you are!

### Activity 1.4 Am I Ready?

**Direction:** Suppose you are invited by the SK Chairman in your barangay as a resource speaker to your fellow age group during an Environmental Awareness Activity and you were asked to give emphasis on the risk factors underlying disasters so that young people will be equipped with knowledge on how to mitigate the effects of a disaster. Have a concept in mind of how you are going to deliver the information. Write down what you want to deliver to the audience. The given rubrics below will be used for scoring.

#### Rubrics for creating a speech.

	4	3	2	1
Content	The speech adheres to the theme/topic.	The speech is on topic but the substance is satisfactory.	The speech is on topic and the substance is fair.	The speech is neither on topic nor has substance.
Organization of Thoughts	The speech is very well organized and informative.	Clear words are used.	Some pieces of information are not clear and hard to follow.	Ideas and pieces of information seem to be randomly arranged and improvement is needed.

Cox, Janelle. "Writing Rubrics." ThoughtCo, Feb. 19, 2020, [thoughtco.com/writing-rubric-2081370](https://www.thoughtco.com/writing-rubric-2081370).





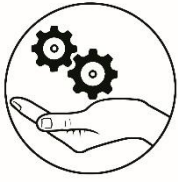
## **Assessment**

**Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.**

1. Which of the following is the process or condition, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity?
  - a. risk factor
  - b. disaster risk
  - c. natural hazard
  - d. man-made hazard
  
2. Which of the following is NOT an element which causes disaster?
  - a. exposure
  - b. hazard
  - c. risk
  - d. vulnerability
  
3. Which of the following **BEST** describes hazard?
  - a. loss of life or injury naturally
  - b. a phenomenon or human activity
  - c. potentially damaging physical event
  - d. reduction of vulnerability and exposure
  
4. Which of the following risk factors **BEST** describes the cause of COVID-19 pandemic?
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5. It refers to the changes that can be attributed “directly or indirectly to human activity altering the composition of the global atmosphere and additionally to the natural climate variability observed over comparable periods of time”?
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  - b. climate change
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  - d. carbon footprint

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  - a. proper knowledge on disaster risk
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  - d. by keeping people and property as distant as possible from hazards
  
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  - b. children and women
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10. The occurrence of landslides in the Philippines is increasing. This kind of disaster will fall under which of the following risks?
  - a. poverty and inequality
  - b. climate change and weak governance
  - c. climate change and environmental degradation
  - d. climate change and globalized economic development
  
11. The ages below are average years ranges affected by specific situations happening as a disaster occurs. Which of the following age ranges are “Most Stressed-Out” after a disaster according to Asian Disaster Preparedness Center (ADPC)?
  - a. 16-20
  - b. 20-30
  - c. 30-40
  - d. 40-60

12. Which of the following risk factors is the result in an increased polarization between the rich and poor on a global scale?
- climate change
  - poverty and inequality
  - environmental degradation
  - globalized economic development
13. Which of the following is **NOT** a contributor to the worst outcomes when a disaster happened?
- displacement
  - can handle stress
  - death of someone close
  - massive loss of property
14. Who among the following groups of people are more likely to live in hazard-exposed areas and are less able to invest in risk-reducing measures based on most studies in Asian Disaster Preparedness Center (ADPC)?
- middle class
  - senior citizens
  - young professionals
  - impoverished people
15. It is a risk factor that is both a driver and a consequence of disasters, reducing the capacity of the environment to meet social and ecological needs, what is it?
- climate change
  - weak governance
  - poverty and inequality
  - environmental degradation



## ***Additional Activities***

### **Activity 1.5 Fill Me!**

**Direction:** Supply the missing letters to complete the word/s that described the various effects of disaster. Statements are provided as clues.

1. The elements at risk from a natural or man-made hazard event.

\_ X \_ \_ S \_ \_ E

2. These are processes or conditions, often development-related, that influence the level of disaster risk by increasing levels of exposure and vulnerability or reducing capacity.

D \_ S \_ \_ \_ E \_ R \_ \_ \_

3. The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazard.

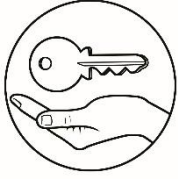
\_ U \_ N \_ \_ A \_ \_ L \_ \_ Y

4. Damage to both public and private infrastructures

I \_ F \_ \_ S \_ R \_ \_ T \_ R \_ D \_ \_ A \_ E

5. Many people must abandon their homes and seek shelter in other regions which may cause large influx of refugees that disrupt accessibility of health care and education, as well as food supplies and clean water

P \_ \_ E \_ T \_ \_ L D \_ S \_ \_ A \_ \_ M \_ N \_



## Answer Key

<b>Assessment</b>	1. A 2. C 3. C 4. C 5. C 6. D 7. A 8. C 9. A 10. C 11. D 12. B 13. B 14. D 15. D
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<b>Activity 1.3</b>	1. F 2. A 3. E 4. D 5. C 6. B 7. A 8. D 9. E
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<b>What I know</b>	1. A 2. C 3. C 4. C 5. C 6. D 7. A 8. C 9. A 10. C 11. D 12. B 13. B 14. D 15. D
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<b>Activity 1.5</b>	1. EXPOSURE 2. DISASTER RISK 3. VULNERABILITY 4. INFRASTRUCTURE DAMAGE 5. POTENTIAL DISPLACEMENT
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