

4

Natural Hazards and Disasters

At present, we always hear about different natural disasters. Human lives, property, the public facilities and natural environment are threatened due to these disasters.



Fig. 4.1. - Several disasters

Natural phenomena that may cause damage to community or property are hazards. A hazard is a continuous process. If such incidents affect either the community or property, they become a disaster.



Fig. 4.2 - Hazard



Fig. 4.3 - Disaster

The objective of this chapter is to study both natural hazards and disasters and about the natural disasters that occur in Sri Lanka.

Earth slips is a hazard that occurs in hilly areas. It becomes a disaster according to its impact on people and property. An earth slip that occurs in an uninhabited island is only a natural hazard as it does not damage people or property. However, if it occurs in a densely populated region, it becomes a disaster.

Activities

1. Name five natural hazards you have heard of.
2. State five damages that a natural disaster could cause.
3. Prepare a fact file using pictures about natural disasters.

Natural Disasters in Sri Lanka

A natural disaster is a destructive force that may occur within a short period of time. At present, Most of the hazards found in Sri Lanka are increasingly turning into disasters due to unfavourable human activities. Several hazards such as droughts, floods, earth slips, cyclones, lightning, tsunamis and earth quakes are some examples for such instances.

Drought

The dry condition that prevails for a long period in a certain area, as a result of the delay in the rainfall due for a particular period.

Drought is a hazard that can exist in a region at any period. However the attention focused on drought is less. It is because, a drought is a silent destructive force that begins without our knowledge and develops gradually creating a crisis in the whole human society. Map 4.1 shows several districts of Sri Lanka where droughts occur.

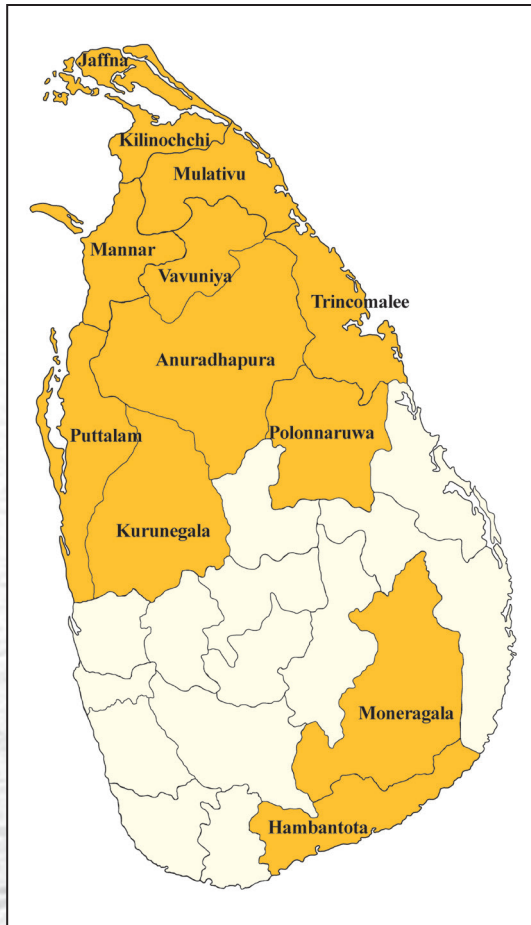
Reasons for droughts

- Decrease of rainfall over a longer period.
- Setting fire to forests.
- Dry wind currents.
- Increase of global warming.
- Removal of vegetation cover.

Damages caused by drought

The harmful impacts of the drought can be discussed under two fields, as impacts on man and impacts on the environment.

Activities



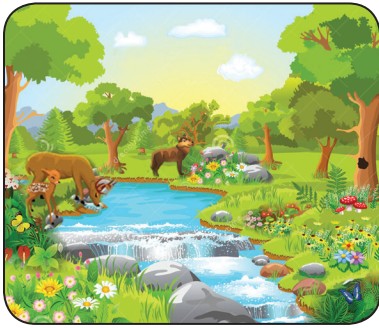
Map 4.1 - Several districts in Sri Lanka where droughts occur

Impacts on man.



- Scarcity of water
- Destruction of crop harvest
- Scarcity of food
- Spread of epidemics.
- Damage to animals

Impacts on the environment



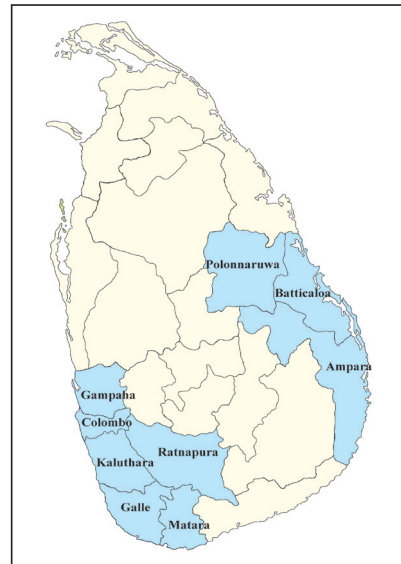
- Increase in environmental temperature.
- Decrease in ground water level.
- Occurance of bush fires.
- Destruction of forests.
- Destruction of bio resources.
- Infertility of soil.
- Damage to scenic beauty.

Activities

1. Mark and shade the districts on a map of Sri Lanka where droughts occur.
2. Write two reasons for droughts.
3. Present three factors as to how a drought affects human activities.
4. Prepare a report either observing or collecting information on the changes occur in the environment during a drought.

Flood

When a large mass of water is collected in rivers, canals streams, reservoirs and other natural waterways in a short period of time, they begin to overflow. At present, flooding of rainwater even in a light shower is a common feature in urban areas where



Map 4.2 - Several districts that are subjected to disaster of flood in Sri Lanka.

rivers and other waterways are not found. Map 4.2 shows several districts where floods occur in Sri Lanka. Yet, with the increase in the intensity of rainfall, floods may occur in all districts of Sri Lanka.

Reasons for flood

- Incessant heavy rains
- Clearing of forests in hilly areas
- Reclamation of lowlands
- Sand mining in river valleys

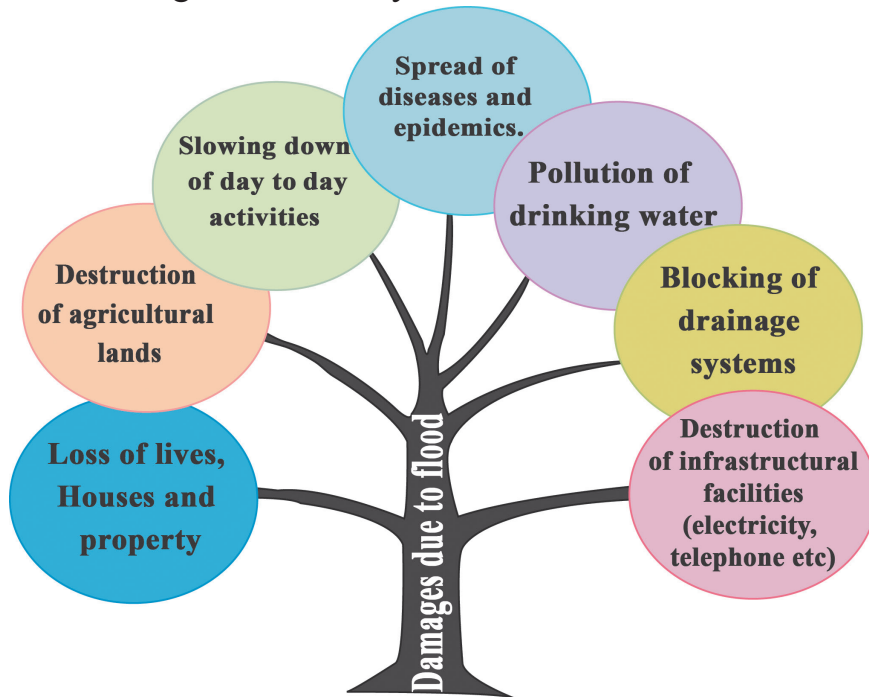


Fig. 4.4 - Damages due to flood

Activities

1. i. Mark and name five river valleys where floods occur on an outline map of Sri Lanka.
ii. Shade five districts where floods occur on the same map.
2. In which climatic zone do floods occur frequently?
3. What are the districts in the dry zone where floods may occur?
4. Draw a picture to show a flooded area.

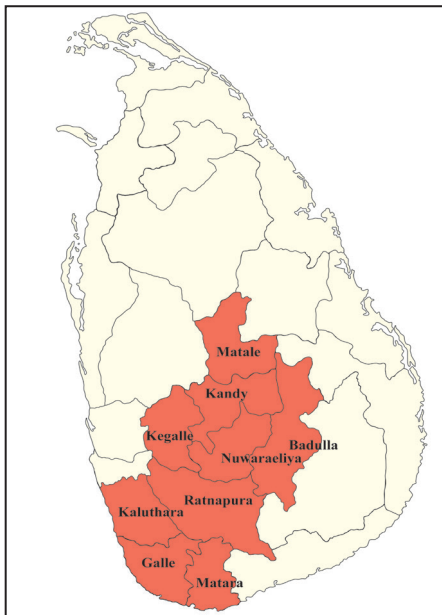
Earth slips

Sliding of a large portion of the earth located at a higher elevation downwards along a slope with rock boulders, gravel and soil lumps is called an earth slip.

At present, earth slip is a common disaster in Sri Lanka. Though it is a natural process, human activities influence it to a great extent. Reasons for the earth slips can be divided into two categories.

Natural Causes	Human Activities
<ul style="list-style-type: none">• Incessant rain• Lands with steep slope.• Existence of weathered rock layers.• Earth quakes.	<ul style="list-style-type: none">• Setting fire to the forests in mountainous areas.• Improper use of land in mountainous areas.• Insufficient research before doing constructions.• Blocking of natural water ways..• Storing of water in highlands.

Map 4.3 shows the districts of Sri Lanka where earth slips occur frequently.



Map 4.3 - Several districts of Sri Lanka where earth slips occur.

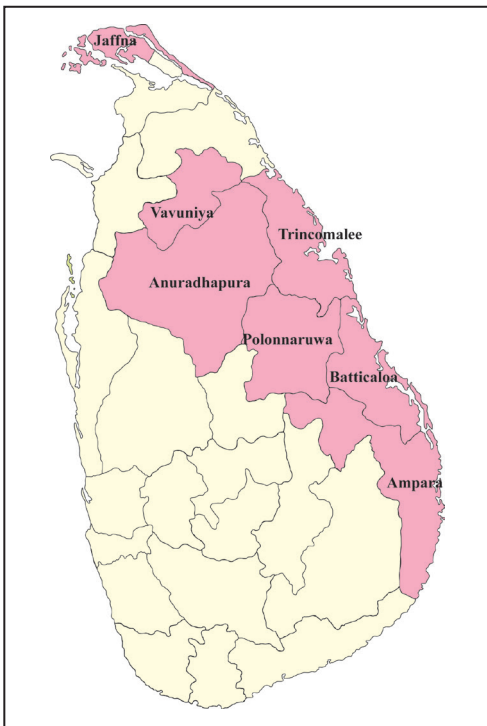
Damages from Earth slips

- Loss of lives and property.
- Destruction of cultivated lands.
- Destruction of the environment.
- Water bodies become shallow and canals are blocked.
- Destruction of infrastructure facilities.
- Impairment of normal life.

Activities

1. Briefly explain what a landslide is.
2. Mark and shade five districts where landslides occur frequently in an outline map of Sri Lanka.
3. Select the reasons for landslides from the list given below Wind, heavy rains, high temperature, reclamation of lowlands, steep slopes, cultivation in hilly areas, flat lands, storing water in high lands, blocking river mouths, earth quakes.
4. Create a poster depicting the disasters that could occur during an earth slip.
5. Suggest three actions that can be taken to prevent earth slips.

Cyclones (Storms)



Map 4.4 - Several districts of Sri Lanka subjected to the influence of cyclones

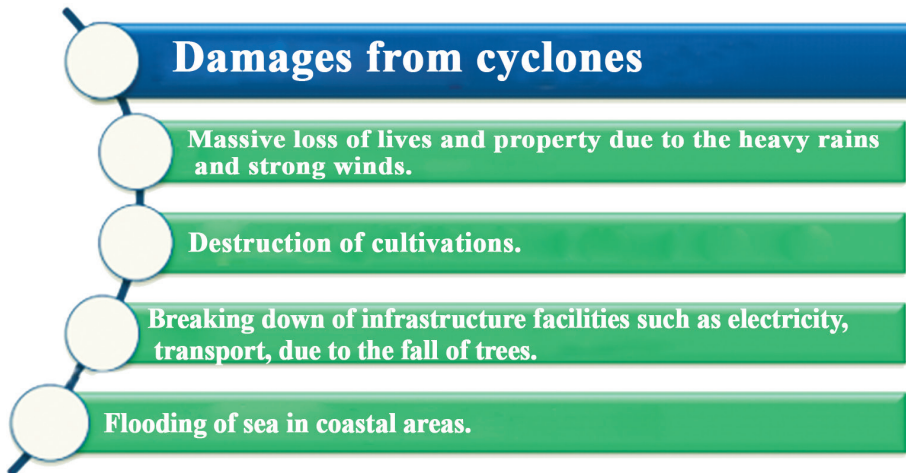
The hard blowing wind while spinning fast in a swirl is known as a cyclone or a storm.

High temperatures in a tropical zone and development of low pressure centers influence the origin of cyclones.

Sri Lanka is a country located in the tropical zone. Due to the influence of the low pressure centers that originate in the Bay of Bengal, Sri Lanka is affected by cyclones frequently.

The cyclonic winds enter the island from the Eastern and North East coasts and exit from the

North Western coast. As a result the Northern and Eastern regions of Sri Lanka are highly affected by cyclones. Identify the regions affected by the cyclones by observing the Map of Sri Lanka.



Activities

1. What is a cyclone?
2. On a map of Sri Lanka mark and shade the districts of Sri Lanka that get affected by the cyclones.
3. Prepare a list of damages caused by cyclones.
4. Present suggestions to minimize these damages.

Thunderbolts (Lightning)

Discharge of an electric current between two opposite charges due to the electric phenomenon that occur in a cloud is known as a thunderbolt.

Accordingly, discharge of an electric current may occur in a cloud itself, between two clouds or from a cloud to the earth. These electric currents can cause huge damages. Although, lightning may occur any time of the year, in Sri Lanka, it often occurs during the months of March-April and October- November when the convectional process is active.



Damages of Thunderbolts/ lightning

- Loss of lives and property.
- Breaking down of electric cable systems.
- Destruction of houses.
- Breaking down of communication networks.

Prevention of Thunderbolt accidents

- Keep away from open places when there are thunder showers.
- Keep away from tall trees.
- Avoid travelling during such occasions.
- Disconnect all domestic electric circuits.
- Do not use telephones.
- Do not construct buildings under high tension electric lines.
- In house constructions, installing of electric circuits should safely be done by a skilled technician.

Activities

1. Prepare an instructional hand out to make people of aware of the methods that could be followed to prevent or minimize the accidents of lightning.

Tsunami

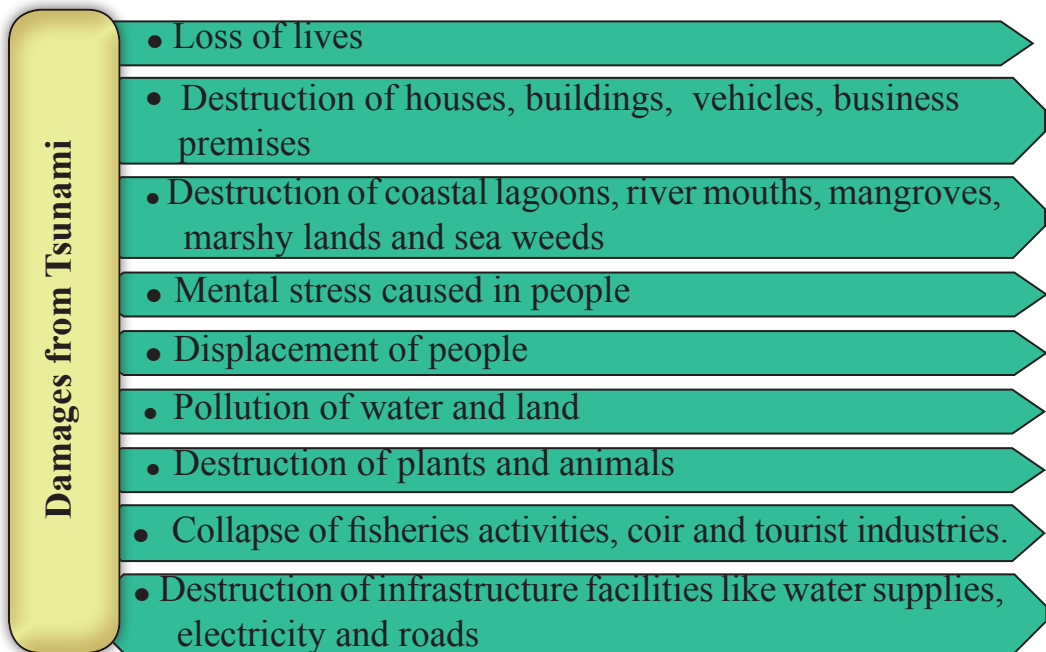
The waves that travel fast towards the coast due to the occurrence of earth quakes, earth slips or volcanic eruptions in the sea bed are called tsunami.

Tsunami is a word derived from Japanese language. “Tsu” meaning “harbour” and “nami” meaning “waves”. Tsunamis are also known as very tall waves that move towards the coast.

Since Sri Lanka is an island, all the lands associated with the coastal area around it are open to this hazard. Though it is not a common disaster like others, the impact is enormous. The catastrophic tsunami that affected Sri Lanka on 26th of December, 2004 resulted massive destruction of lives and property.

Causes for Tsunami

- Earth Quakes,
- Earth Slips,
- Volcanic eruptions occur in the sea bed
- Falling of meteors into oceans.



How to escape from a Tsunami

- Be alert about Tsunami warnings.
- Do not stay close to the sea to look at the receding of sea during a tsunami condition.
- Go to a safe higher place as soon as possible

Activities

1. Define what a tsunami is.
2. Write three causes for tsunami.
3. When did tsunami conditions affect Sri Lanka?
4. Mark and name the regions of Sri Lanka that were affected by the tsunami disaster on an outline map of Sri Lanka.

Earth quakes

A sudden tremor that occurs in the earth due to the high temperature in the interior of the earth and changes in pressure is known as earth quake.

Though the hazard of the earth quake is present in every part of Sri Lanka, it has not converted into a condition of disaster yet, but, earth quakes occurring in nearby regions may also affect Sri Lanka.

Reasons for Earth quakes

- High temperature in the interior of the earth and changes in pressure
- Breaking down of the equilibrium of the earth due to the construction of reservoirs and large scale constructions
- Nuclear explosions
- Volcanic eruptions

Damages from Earth quakes

- Loss of lives and property
- Displacement of people
- Slowing down of day today activities
- Destruction of cultivated lands
- Destruction of vegetation and animals

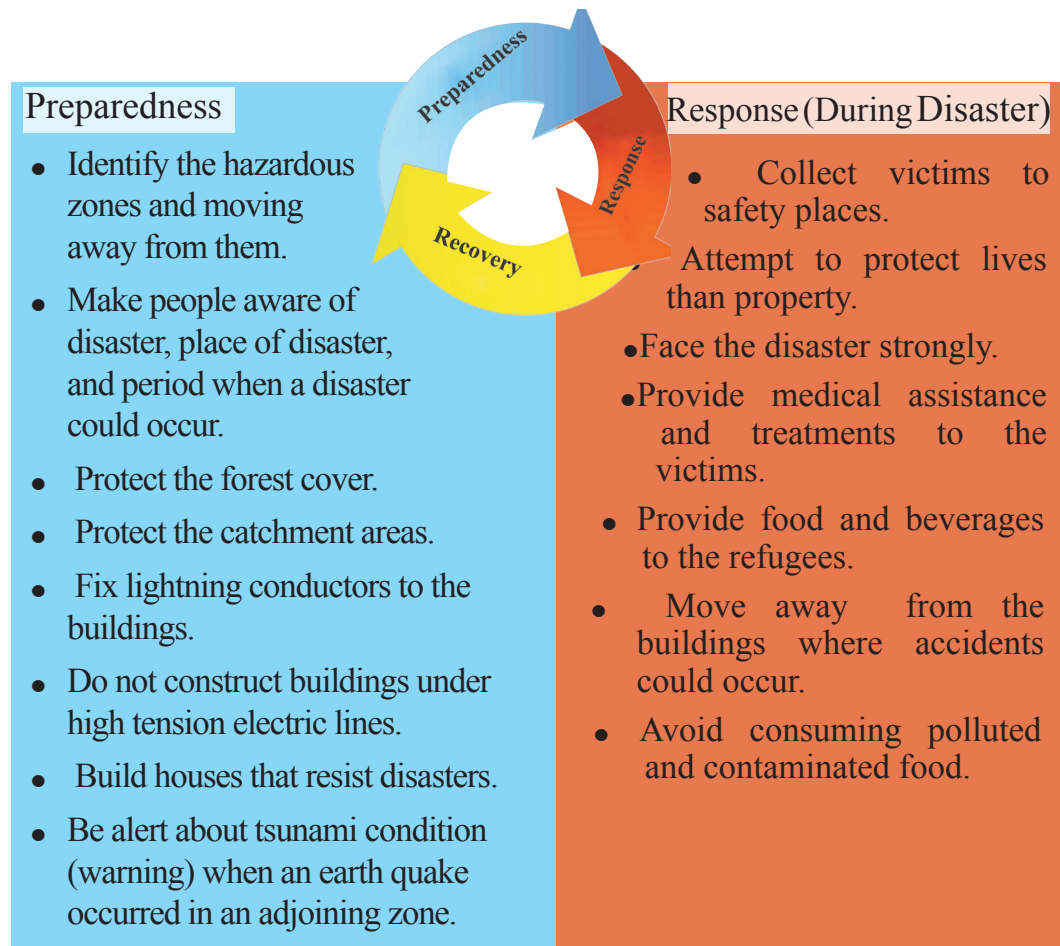
Activity

1. Complete the following table with damages from earth quakes.

Damages to the people	Damages to the environment.

Facing a disaster

Man cannot prevent natural disasters completely. But their effect can be minimized. Disaster management is important for it. The basic steps for disaster management are preparedness, response and recovery. Following examples show how we should respond to natural disasters shown above according to the disaster management cycle.



Recovery

- Identify problems.
- Establish emergency disaster centers.
- Introduce disaster kits.(life saving kits.)
- Provide relief to the victims.
- Conduct health programmes.
- Plan the activities to restore the mental health of the victims.

Activities

1. Name five natural hazards
2. Explain the difference between natural hazards and disasters.
3. Complete the following table with reference to the disasters that occur in your region.
4. Complete the following table.

Natural Disaster	Reasons	Methods of minimizing the damage
Flood	01. 02.	
Droughts	01. 02.	
Cyclones	01. 02.	
Earth Slips	01. 02.	

Assignment

1. Name two natural disasters that occur frequently in Sri Lanka.
2. Prepare a fact file including pictures of areas that have affected by natural disasters (collected from newspapers, magazines etc.)
3. Find and present the causes for these disasters.
4. Get into groups and prepare a hand-out including the steps that could be used to aid the victims.

Global Climatic Changes

Long-term or short term changes that happen in the general climatic pattern is known as climatic changes.

It is seen that though it took a longer period for changes in the climate in the past, they occur in a short period of time at present. Drought, harsh cold seasons, floods, cyclones etc can be identified as the results of these changes. Such climatic changes that take place globally have influenced Sri Lanka too.

Reasons for climatic changes.

- Excessive burning of fossil fuel
- Destruction of forests
- Warming of the atmosphere
- Burning of agro and industrial waste
- Volcanic eruptions

How climatic changes affect Sri Lanka.

1. Destruction of coastal eco systems due to the rise of sea level.

- Inundation of coastal lands.
- Pollution of drinking water.
- Increase in coastal erosion.
- Breaking down of fishing industry and destruction of coastal industries.

2. Destructions caused by heavy rains

- Floods and earth slips
- Loss of lives and property.
- Destruction of infrastructure facilities.
- Reduction of agro harvest.

3. Destructions due to the increase of atmospheric temperature.

- Occurrence of droughts.
- Scarcity of water.
- Decrease in harvest.
- Changes in agricultural patterns and types of crops.
- Increase the spreading of diseases, mostly that could not be diagnosed easily
- Spread of skin, eye, and respiratory diseases.
- Occurrence of mental stress.

4. Emergence of crisis connected to the production and use of energy sources.

- Increase in the use of air condition equipment and fans due to the increase in temperature.

- Slowing down of the generation of hydro electricity.
- Increase of the demand for electricity and thermal power energy.

5. Actions Taken to Minimize the Climatic Changes.

- Minimize the emission of unfavourable gases like Carbon Dioxide in the fields of industry, agriculture and transport.
- Minimize deforestation.
- Establish Forest Reserves.
- Intensify the use of bio gases with less effect on the environment.
- Enact limits to the emission of Green House Gases that increases the global warming.
- Solid waste management.
- Pass laws to stop unauthorized constructions.
- Make people aware.
- Work collaboratively with the other countries in the world.

Activities.

1. What are the reasons for the global climatic changes?
2. State three environmental damages that occur due to the increase in global warming.

Assignments

1. Describe briefly how you could contribute to minimize the climatic changes.
2. i. Create a poster including protective steps to make aware the victims of such disasters.
3. Present a report, finding the reasons for the increase of accidents of thunderbolt using newspapers.
4. Propose three steps you use to get away if you happen to face such a disaster
5. i. If a natural disaster has occurred in your area or area around your school, visit that place with your teacher or an adult and observe the disaster.
 - ii. Record the damage of that disaster.
 - iii. Collect the reasons for that disaster by inquiring.
 - iv. Present a report to the class including all information.
 - v. Discuss and present the steps that could be used to prevent or minimize those damages.

Glossary

• Natural Hazards	- ස්වාභාවික උපද්ව	- இயற்கை அழிவுகள்
• Disasters	- ආපදා	- அனர்த்தங்கள்
• Drought	- නියඟය	- வரட்சி
• Wind	- සුළං ප්‍රවාහ	- காற்றுக்கள்
• Global Warming	- ගෝලීය උණුසුම	- பூகோள வெப்பம்
• Bush Fire	- ලැව් ගිනි	- காட்டுத் தீ
• Flood	- ගංවතුර	- வெள்ளப்பெருக்கு
• Earth Slips/ Landslides	- නායයෑම්	- நிலச்சரிவு
• Rocks	- පාෂාණ	- பாறைகள்
• Cyclones	- සුළි සුළං	- சூறாவளி
• Thunderbolt /Lightning	- අකුණු සැර	- மின்னல் தாக்கம்
• Electric phenomenon	- විද්‍යුත් ක්‍රියාකාරිත්වය	- இலத்திரனியல் செயற்பாடு
• Convectional Process	- සංවහන ක්‍රියාවලිය	- மேற்காவுகைச் செயன்முறை
• Earth Quake	- භූමිකම්පාව	- நிலநடுக்கம்
• Volcanic Eruption	- ගිනිකඳු පිපිරීම	- எரிமலை கக்குகை
• Equilibrium of the earth	- පෘථිවිසමතුලිතතාව	- புவியின் சமநிலை
• Nuclear Explosions	- න්‍යෂ්ටික පිපිරවීම්	- அணு வெடிப்பு
• Disaster Management	- ආපදා කළමනාකරණය	- அனர்த்த முகாமைத்துவம்
• Catchment Area	- ජල පෝෂක ප්‍රදේශ-	- நீரேந்துப்பிரதேசங்கள்
• Lightning Conductors	- අකුණු සන්නායක	- மின்னல் தாங்கி
• Hazardous Zones	- අවදනම් කලාප	- எச்சரிக்கை வலயங்கள்
• Emergency Disaster Centers	- හදිසි ආපදා මධ්‍යස්ථාන	- அவசர விபத்து மத்திய நிலையங்கள்
• Disaster Kits	- ආපදා කට්ටල	- விபத்து தொடர்பான கருவித் தொகுதிகள்
• Global Climatic Changes	- ගෝලීය දේශගුණික වෙනස්වීම	- உலகக் காலநிலை மாற்றங்கள்
• Burning of Fuel	- ඉන්ධන දහනය	- எரிபொருள் பாவனை
• Sea Erosion	- වෙරළ බාදනය	- கரையோர அரிப்பு
• Deforestation	- වන හරණය	- காடழிப்பு