

# 18 Natural Disasters



The losses brought about on humans, animals and property by a natural process without the interference of man is named a natural disaster.

There is a number of natural disasters affecting Sri Lanka. Of them, here we study about the below mentioned **natural disasters**.

- Cyclones
- Earthquakes
- Tsunami
- Wild fires

## 18.1 Cyclones

When the pressure of the air at a certain place in the atmosphere closer to the Earth's surface drops below the pressure around that place, a **low pressure area** is created.

If this low pressure situation develop further, it becomes a **depression**. If situation develops further it gives rise to a **cyclone**.

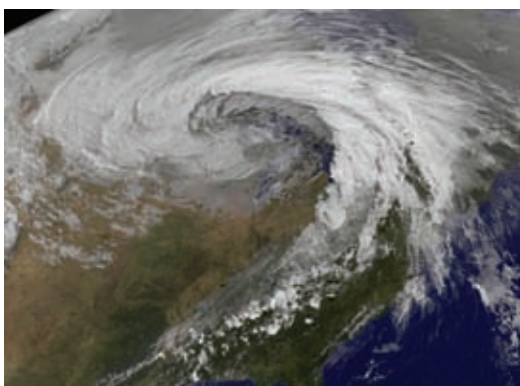


Figure 18.1 (a) – Satellite picture showing the movements of clouds during a cyclone

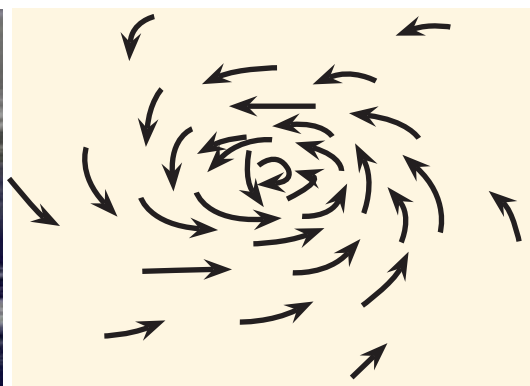


Figure 18.1 (b) – Movement of air during a cyclone

### Factors that cause cyclones

- Existence of a large oceanic area and its temperature being above 27 °C to a depth of 60 m.
- Occurrence of convection current in the atmosphere
- Minimal tendency of the horizontally blowing wind to sweep vertically

- Location of the point at which the depression is closer to the equator. (cyclones are not formed on the equator)
- Increasing humidity of the atmosphere beginning from surface of the ocean to higher atmospheric levels (higher than 60%).

As cyclones are born on meeting the above conditions, they are restricted only to some oceanic regions on the Earth.



## For extra knowledge

### Types of cyclones

- The cyclones formed in the North and South Asian oceans are known as tropical cyclones.
- The cyclones generated in the Northern Pacific Ocean are called as typhoons.
- Cyclones produced in the North Atlantic Ocean are termed as hurricanes.

## Structure of a cyclone

In addition to the circulation, air rises up in the central part of the whirl of the cyclone. This upward movement of air gives rise to a cylindrical **cloud wall**. The central part of the whirlwind is called as the **eye**. It would have spread within a region of 30 - 60 km from the centre of the whirl. This eye is a region with little wind and free of rain and clouds. In satellite photographs this appears as a black circle.

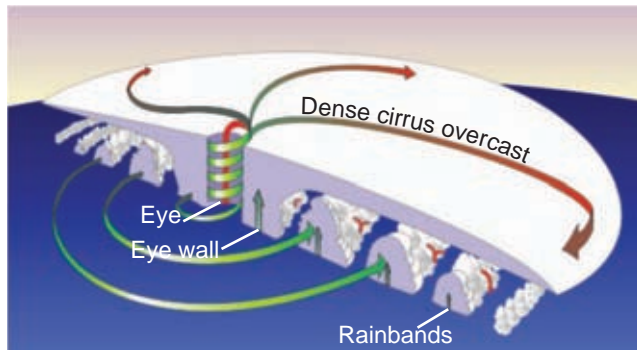


Figure 18.2 – Cross sectional structure of a cyclone

The cylindrically arranged cluster of clouds around the eye is known as the eye wall. In this region heavy rains and fast blowing winds occur. Due to the eye wall, a few spiral bands of clouds can be seen. In these regions too, heavy and speedy winds occur.

Cyclone is the main mechanism that distributes the huge solar energy received by the regions close to the equator of the globe. Cyclones originating time to time in Indian, Pacific and Atlantic oceans provide the factors essential for the life of plants and animals on the Earth. Though in nature, cyclones is a favourable phenomenon like this, today more attention is focused on the disasters brought about by it.

### An experience of a cyclone

The date was 26th December 2000. It was a sunny day for Trincomalee town. The residents of the town were involved in their daily routing as usual. Although the weather forecasts of that day had informed that a cyclone would occur, some seemed not to be concerned about it.

At about eight o'clock a black cloud appeared from the sea side. Before half an hour passed, a fast blowing wind swept across the town. At the same time it started to rain heavily. Roofs of buildings flew away with the wind. Trees were uprooted. Electricity was cut off. Residents of the town ran to safer places.

After some time rain stopped and the wind also subsided. Some people came out from the safe places. But, again a strong wind started to blow in the opposite direction as earlier. Rain started again. Buildings which were not destroyed by the wind which blew first were devastated by this second.

Given below are numerical data about the losses caused by the cyclone described above.

- Number of families hit - 170 419
- Number of houses fully damaged - 57 273
- Number of houses partly damaged - 20 860
- Amount of cultivated land destroyed - 20 810 acres
- Number of deaths - 17
- Loss caused to the national economy - Rs. 1500 million

Now let us compare the above experiences with the action of a cyclone. Within the cyclone winds, the whirl is very fast and that whirl moves in a certain direction with a certain speed.

After a strong blowing of wind from one direction, comes a state of tranquility. That is when the eye of the cyclone passes through that point. When the other part of the whirl passes that point, a speedy wind, as was the one blew first, blows in the opposite direction.

**Table 18.1 - Information about some cyclones that affected Sri Lanka in the past 50 years**

Year	Date	Area from which the cyclone entered Sri Lanka	Number of deaths
1964	22 December	Trincomalee	More than 1000
1978	22 November	Batticaloa	915
1992	12 November	Pottuvil	04
2000	26 December	Trincomalee	17
2008	25 November	Eastern coast	15
2016	15 May	Eastern coast	101

According to the above table, what are the months in which most of the cyclones affected to Sri Lanka had occurred? From which areas had cyclones entered to Sri Lanka most?

It may be clear to you that most of the cyclones that defected Sri Lanka had occurred in November and December and they had entered Sri Lanka from the Eastern coast. In 1978, the death toll due to cyclones was 915. However, since warnings could be given because of the development of technology, the number of deaths could be reduced in subsequent cyclones.



### For extra knowledge

Most of the storms affecting Sri Lanka are born in the Bay of Bengal.

Let us do the activity 18.1 to demonstrate the movement of air during cyclones, using water.



### Activity 18.1

**You will need :-** Two identical transparent plastic bottles, water, gum tape small pieces of paper or colourant

**Method :-**

- Take two identical, transparent plastic bottles.
- Fill about 3/4 of one of them with water. Colour the water or put some pieces of paper into water.
- Place the mouth of the empty bottle on the mouth of the bottle containing water and connect those two tightly with gum tape.
- Now rotate the apparatus slowly in anticlockwise.

You will be able to understand how air moves during a cyclone by the movement of water in the bottle placed on top.

During the past century, 13 cyclones have entered to Sri Lanka from the Eastern coast of the country. Among those cyclones, three were very powerful cyclones.

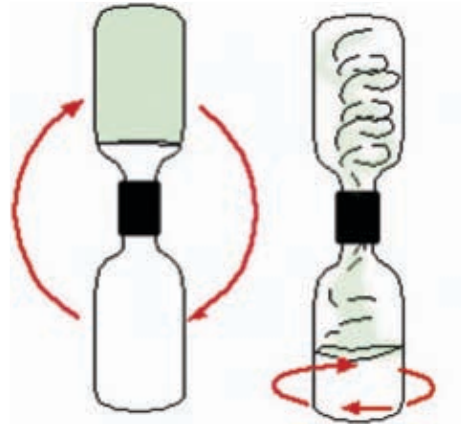


Figure 18.3



Figure 18.4 - Paths of cyclones which entered Sri Lanka from 1901 to 2000



Figure 18.5 - A cyclone



### Assignment 18.1

Study the above map and prepare a list of districts in Sri Lanka which are prone to cyclones.

Using high technology, the Department of Meteorology keeps vigilance over the cyclones around 24 hours. In occasions of a probable cyclonic situation to Sri Lanka, the latest information about it are communicated to the relevant government institutions. The telephone number of the Department of Meteorology is 011 2 686 686.

## 18.2 Earthquakes

An earthquake is a jolt or shoulder like movement of the Earth's surface. Less violent earthquakes are known as **tremors**.

**Earthquakes** and **Earth tremors** are caused by releasing of the energy stored in the Earth's crust.

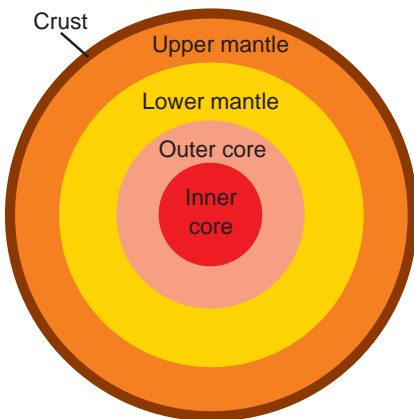
Earthquakes bring heavy damages to man-made creations on Earth.



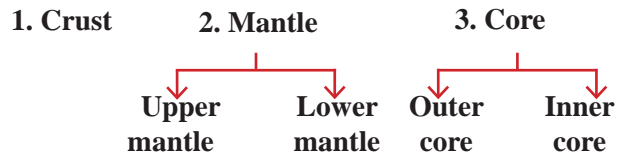
**Figure 18.6 – Photographs of the same area before and after the Earthquake**

In order to understand how earthquakes are happening, we need to know about the structure of the Earth. The figure 18.7 shows the internal structure of the Earth.

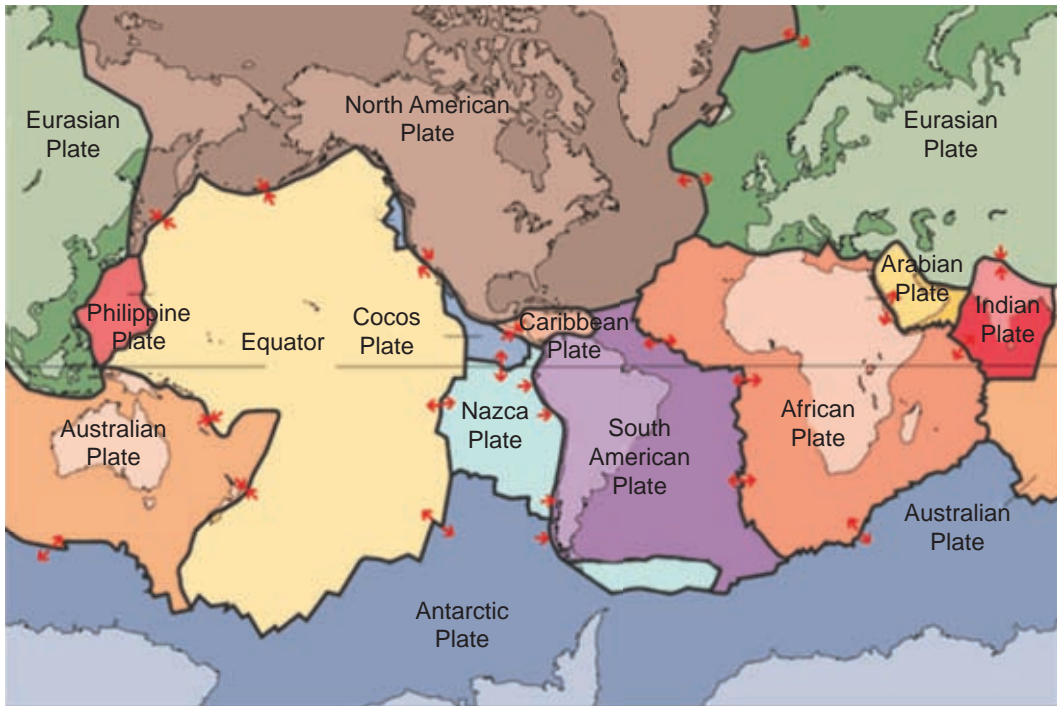
The Earth is composed of three main structures.



**Figure 18.7 – Internal structure of the Earth**



Evidences support the fact that the crust, the topmost layer of the Earth is composed of a number of tectonic plates which move relative to one another. The Earth's crust consists of a few large tectonic plates. They can be identified by the following map (figure 18.8).



**Figure 18.8 – The map of tectonic plates**

The tectonic plates which form the Earth's crust move relative to one another. By the activity 18.2 you can understand how this happens.



## Activity 18.2

**You will need :-** Plate or a shallow basin, water, colourant, piece of styrofoam

**Method :-**

- Pour water into a plate or a shallow basin. Add some colour to water.
- Cut a polystyrene sheet into pieces and float them on water.



**Figure 18.9 – Pieces of styrofoam floating on water**

- Now shake the container gently.
- Observe the way the piece of polystyrene move.

The movement of the pieces of polystyrene corresponds to the way the tectonic plates move on semi-solid **magma** in the upper part of the mantle.

## How tectonic plates move

It has been identified that there are three ways of movement of tectonic plates relative to one another at the boundaries.

- Divergent border
- Convergent border
- Slip border

### Divergent border

At this border, the two tectonic plates move away from each other.

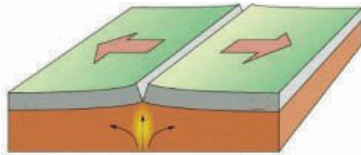


Figure 18.10 – Illustration of a divergent border



Figure 18.11 – Mid Atlantic Ridge

At divergent borders, magma in the upper mantle rises up between the two tectonic plates and therefore a new crust is created. Most of such tectonic plate borders are located in the oceanic floor.

e.g. Mid Atlantic ridge

### Convergent border

At this border, two tectonic plates collide and one plate moves underneath the other. Volcanoes erupt in the regions in which these movements occur.

e.g. Saint Helen's mount (Figure 18.13)

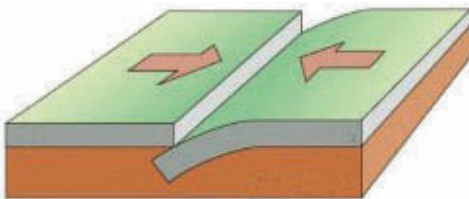


Figure 18.12 – Illustration of a convergent border

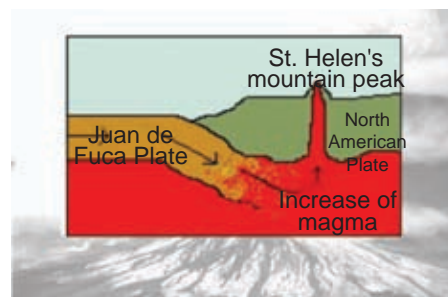


Figure 18.13 – St. Helen's mount



## Slip border

At this border, the two tectonic plates move away from each other while being in contact.

Sometimes, the tectonic plates cram into each other during the movements. Violent earthquakes may happen when lot of energy is collected during such movements.

e.g. Saint Andrea's fault (Figure 18.15)

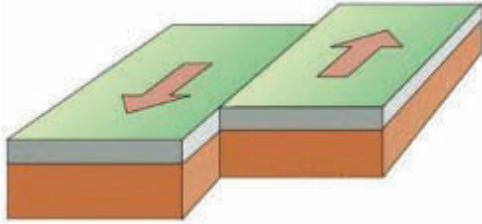


Figure 18.14 – A slip border



Figure 18.15 – Saint Andrea's fault

By the activity 18.3, you may have an understanding about how the tectonic plates move on the Earth's crust.



## Activity 18.3

**You will need :-** A boiled egg

**Method :-**

- To Demonstrate the Earths' crust and the movements of tectonic plates,
- Tap a boiled egg on the table and make several cracks on it.
- The shell of the egg corresponds to the Earth's crust and the egg white underneath it, corresponds to the upper mantle.
- Colour the boundaries of the cracks using a marker. Take the egg onto the palm and squeeze it gently, so that the edges move back and forth.



Figure 18.16

When squeezed, it can be seen that at some points of the cracks the pieces of shells move apart. Those points correspond to **divergent borders**. At some other places it appears that some pieces come closer. Such places illustrate **convergent borders**.

In some other places it appears that the pieces of the shell move forward and backward relatively. Those places correspond to **slip borders**.

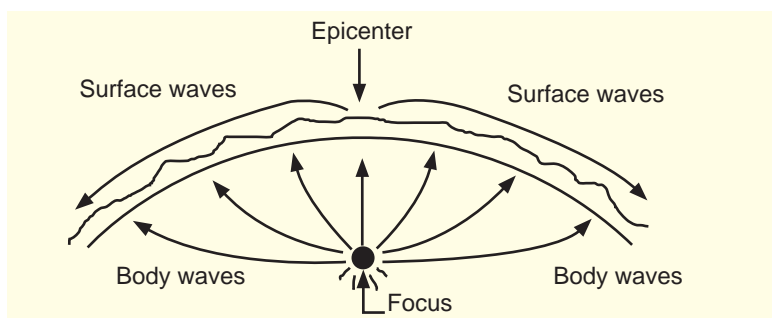


## For extra knowledge

Compared to the Earth, the thickness of the crust is 2% of its diameter. Compared to the diameter of an average egg, the thickness of the shell is also 2% of it.

### Intensity of earthquakes

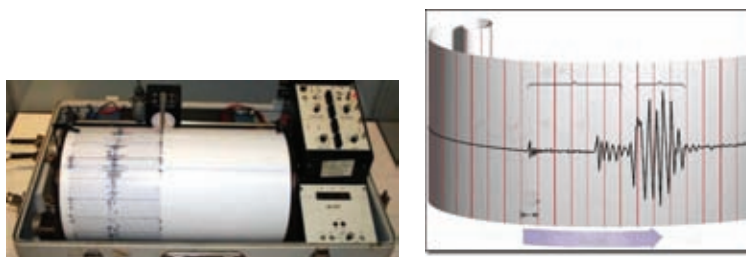
At the points at which the tectonic plates have collision impact, the layers of rocks bend. When the force exerted to bend them exceeds the yield point of the rocks, the rocky layers break. This point of breakage is the **focus** of the earthquakes. The point on Earth above the focus is the **epicenter**.



**Figure 18.17 – Focus and epicenter of an earthquake**

Seismic waves spread in all directions from the focus of an earthquake. These waves convey energy along the surface of the Earth and also through the interior of the Earth.

The strength of these seismic waves can be measured by the **seismometers** installed at various places of the Earth. The apparatus which automatically records the information related to seismic waves is called the **seismograph**.



**Figure 18.18 – A Seismograph and its records (Seismograms)**

The scale that is calculated on the basis of the information recorded by the seismograph and the damage inflicted to buildings, ground and humans is called the **Richter scale**.

This scale has been introduced by Charles F. Richter in 1953.

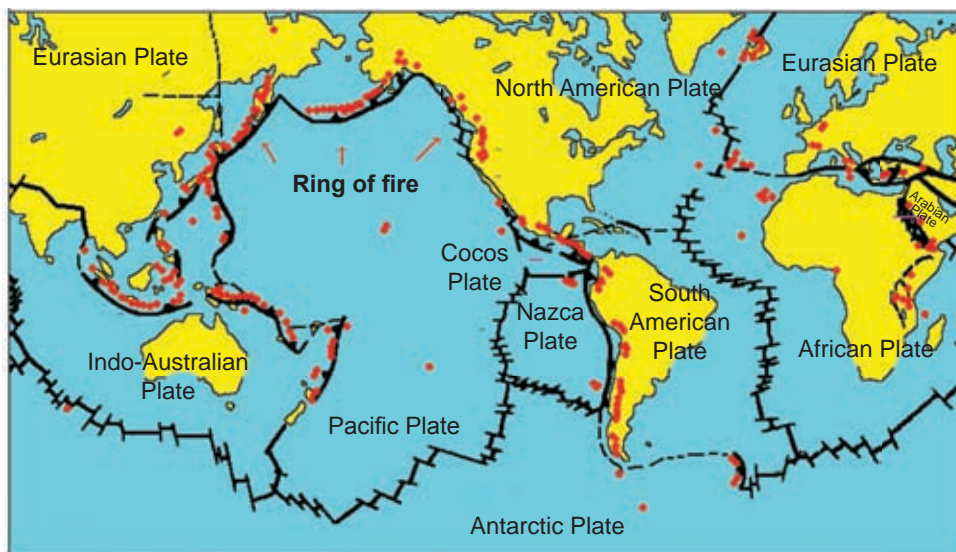
Table 18.3 gives a short description of the intensities of earthquakes and their results as against the Richter scales values.

**Table 18.3 - Intensities of earthquakes and their results**

Richter scale value	Result
2.0 - 3.5	Not felt by human but is recorded in the seismograph
3.5 - 5.5	Felt by everybody
5.5 - 7.3	Buildings may be destroyed
7.4 - 8.0	A big damage may be caused
above 8.0	Can cause a complete destruction

## Worlds' regions prone to earthquakes

Study well the map (figure 18.19) indicating the regions where strong earthquakes occurred in the world.



**Figure 18.19 - Map indicating the regions subject to strong earthquakes**

From the above map, it may be clear to you that earthquakes have occurred mostly in the borderland regions. Of them, too most of the earthquakes have broken out in the region called 'Pacific Ring of Fire'. From the map it can be seen that, this region is the border of the very large Pacific tectonic plate.



## For extra knowledge

Table 18.4 shows the information on strong earthquakes that took place during the past few years.

**Table 18.4**

Value on the Richter scale	Date	Region/Country of occurrence	Number of deaths
6.4	2004.02.24	Morocco	631
9.1	2004.12.26	Sumatra	250 000
6.4	2005.02.22	Iran	612
8.6	2005.03.28	Sumatra	1 313
7.6	2005.10.08	Pakistan	87 000
6.3	2006.05.26	Java Islands	5 782
8.0	2007.08.15	Peru	519
7.9	2008.05.12	China	69 197
6.3	2009.04.06	Italy	308
8.1	2009.09.29	Samoa Islands	189
7.6	2009.09.30	Sumatra	1 115
7.0	2010.01.12	Haiti Islands	160 000
8.8	2010.02.27	Chile	1 525
6.9	2010.04.13	China	698
7.7	2010.10.25	Indonesia	408
6.1	2011.02.21	New Zealand	185
7.9	2011.03.11	Japan	18 184
6.9	2011.03.24	Myanmar	150
6.9	2011.09.18	India-Nepal border	111
6.4	2012.08.11	Iran	306
6.6	2013.04.20	China	193
7.1	2013.10.15	Philippine	222
6.2	2014.08.03	China	617
7.8	2015.04.25	Nepal	9 018
7.3	2015.05.12	Nepal	218
7.5	2015.10.26	Afghanistan	398
7.8	2016.04.16	Ecuador	673
6.2	2016.08.24	Italy	297
6.4	2016.02.05	Taiwan	117

Study the above table and find out the following information.

1. How many earthquakes have occurred during past 13 years which above 7.4 in Richter scale?
2. What are the countries in which, those earthquakes occurred?
3. What is the country in which, the highest number of earthquakes have occurred?



## Assignment 18.2

Find the tectonic plate borders of above countries based on the location and prepare a table. Seek assistance of the Geography teacher if required.

e.g. Sumatra Islands are located on the border between Indo-Australian plate and Eurasian plate

### Human activities that would cause earthquakes

Recently, scientists have observed that, in addition to natural causes, some activities of human could also be the reasons for earthquakes.

- Testing nuclear weapons underneath Earth
- Drilling Earth to great depths to mine oil and minerals
- Erecting dams and constructing large water reservoirs
- Constructing very large buildings of great heights and weights

## 18.3 Tsunami

On the 26<sup>th</sup> December 2004 we had to face the most ruinous natural disaster which affected Sri Lanka in recent times. It was the tsunami disaster. A part of a newspaper article published 12 years after the incident is given in the figure 18.20.

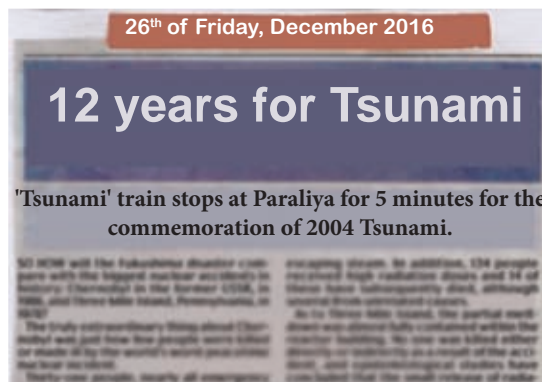


Figure 18.20

In this disaster, 250 000 people died in countries bordering the Indian Ocean. In Sri Lanka about 40 000 were died. The way that tsunami was formed, has been explained by geologists as follows.

That day at 6.58 a.m. in Sri Lankan time, an earthquake of Richter scale value 9.1 occurred in the sea bed near Sumatra Island of Indonesia. The process taking place at a convergent border occurred there. Indian tectonic plate moved underneath the Burmese tectonic plate. Owing to the upward moment of the Burmese tectonic plate and the vast amount of energy released by the earthquake, the oceanic water

raised up. The tsunami wave created by it was spread throughout the Indian ocean at a speed greater than 800 kilometers per hour.

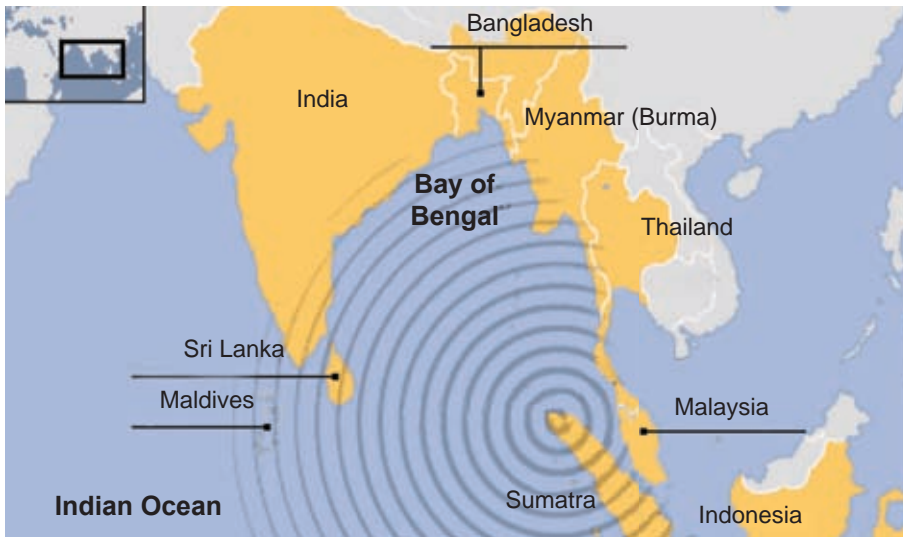


Figure 18.21 –The way of tsunami wave spread in 2004

Let us do the activity 18.4 to demonstrate an event of tsunami.



### Activity 18.4

**You will need :-** A rectangular basin, air filled balloons with different sizes, a pin

**Method :-**

- Pour water about 2/3 the volume of a rectangular basin.
- Sink an air-filled balloon at a narrow end of it and burst it by piercing with a pin.
- Observe the waves formed in water.
- Burst small, medium and large balloons like this and observe if there is any difference in waves created.



Figure 18.22

### Incidents causing tsunami

- Earthquakes occurring in the oceanic bed
- Volcanic eruptions in the ocean floor
- Earth slips in the ocean floor
- Falling of a large meteorite to sea

Of the above, the greatest ruin would be caused by the fall of a gigantic meteorite to the sea. Such a devastation may also be caused by the collision of an asteroid with the Earth.

Table 18.5 shows information regarding tsunami occurred during the past 20 years.

**Table 18.5 - Tsunami occurred during the past 20 years**

Date	Region/Country in which the tsunami occurred	Strength (height of waves)
1994.06.03	Indonesia	5 m
1998.07.17	Papua New Guinea	10.5 m
2004.12.26	Sumatra Islands	50 m
2006.07.17	Java Islands	21 m
2006.11.15	Kuril Islands	2 m
2007.04.02	Solomon Islands	12 m
2009.09.29	Samoa Islands	14 m
2010.02.27	Chile, Argentina	2 m
2010.10.25	Sumatra Islands	3 m
2011.03.11	Japan	2 m
2013.02.06	Solomon Islands	1 m
2014.04.02	Chile	2 m
2015.09.16	Chile	4 m
2016.11.13	New Zealand	2 m

Study the above table and answer the following questions.

1. According to this table, name the country that was hit by the highest number of tsunami disasters.
2. What are the countries that were subjected to tsunami disasters twice?
3. What was the date that the tsunami with highest height occurred?
4. What are the effects caused by the tsunami mentioned in question number 3 to Sri Lanka?



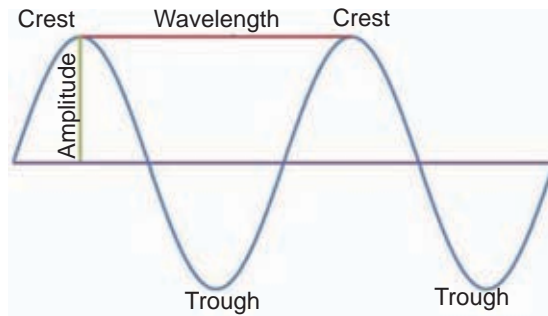
### Assignment 18.3

Find the margins of crustal plates where the above countries are located and prepare a table. Get the assistance of the Geography teacher if required.

e.g. Chile is situated at the boundaries of Nazca plate and the South American plate

## Nature of a tsunami wave

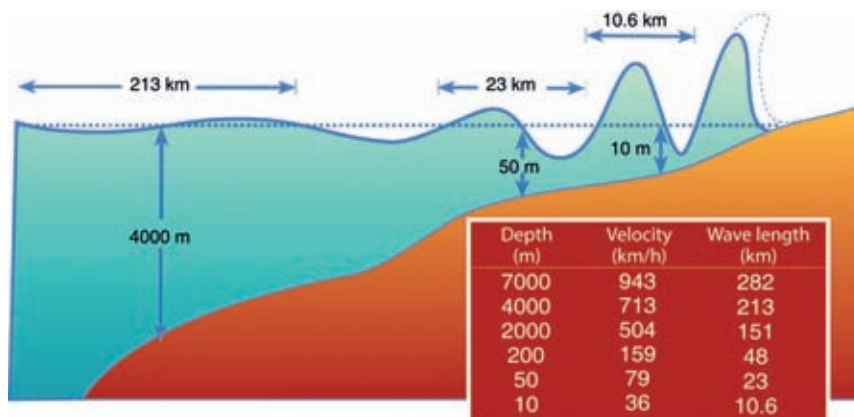
Tsunami waves are a type of water waves. Figure 18.23 illustrates the characteristics of a normal water wave.



**Figure 18.23 – Characteristics of a normal water wave**

A water wave comprises of an alternate series of **crests** and **troughs**. The distance between two successive crests or troughs is called the **wavelength**. The depth from the mid point of a wave to its crest is known as the **amplitude**.

Figure 18.24 shows how the wavelength, amplitude and the speed of tsunami waves change from deep sea to shallow sea.



**Figure 18.24 – How wave length, and speed of the tsunami waves change when they move from deep sea to shallow sea**

The affect of the move which occur in sea surface depend on the depth of water column. In the deep sea, the speed of tsunami waves is high. Their wavelength is also high. But, the amplitude or the height of the waves is low. Therefore, tsunami waves cannot be identified in deep sea. Further the ships streaming in deep sea are not damaged by the tsunami waves.

In the shallow sea, the speed of tsunami waves decreases. Their wavelength also decreases. But, the amplitude or the height of the waves increases. Hence the boats near the coast are damaged by the tsunami waves.

In tsunami waves, the trough first approaches the shore. Then the sea is drawn backwards. This is a forwarding of an imminent tsunami.



Coral reefs and mangroves retard the speed of tsunami waves. Therefore, the coral reefs and mangroves should be protected live without causing damage to them.

Since there is a possibility of tsunami following an earthquake, people should be vigilant about them. Investigations must be made about the sites which have been already damaged by tsunami and the people living in such areas should be made aware about them.

## 18.4 Wild fires

Wild fires have occurred out in jungles from the distant past. When a forest is dry, wild fires may erupt due to natural reasons such as lightning or setting fire deliberately or by mistake.



Figure 18.25 – A wild fire

There are three factors that should be met for a fire to break out.

- Availability of a combustible substance
- Availability of a supporter of combustion or oxygen
- Heating the combustible substance to the ignition temperature

Several factors are affecting the spread of wild fires.

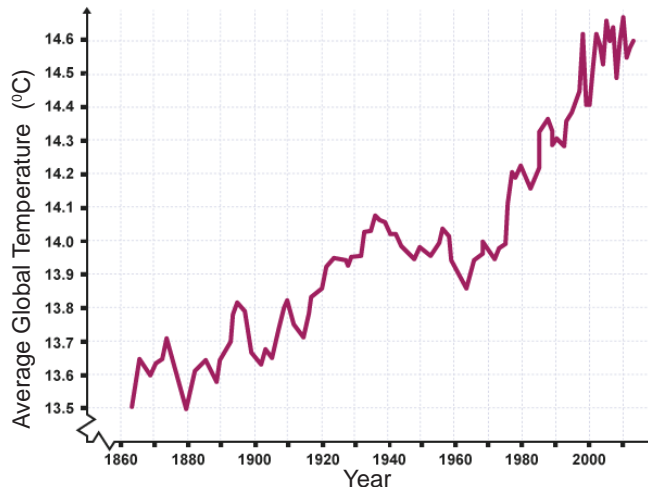
- Existence of dry plant leaves or tree stems as the combustible materials
- Prevalence of a high temperature
- Low humidity (water vapour content) in air
- Profuse supply of oxygen to the fire due to blowing wind
- Slope land that helps upward spread of the fire

A wild fire is a terrifying scene. In a wild fire, a very tall column of fire moves forward very fast. The smoke produced in this, rises to a height of thousands of meters in the atmosphere. More and more fires also would break out because fire flames are carried through air to distant places from the fire.

Plants and animals have been damaged due to wild fires. Organisms are adversely affected even by the smoke produced by wild fires. It has been reported that respiratory difficulties and even deaths have occurred in certain instances. In Sri Lanka approximately 4 000 acres of land has been destroyed in 2016 owing to wild fires.

## 18.5 The relationship between increase in global warming and natural disasters

During the past 100 years, the average temperature of the world has been increased. This condition is known as global warming. The graph in figure 18.26 shows how the average temperature changed from 1860 to 2000 in the world.



**Figure 18.26 – The change of average temperature from 1860 to 2000 in the world**

From the above graph it is clear that the average temperature of the world has increased during this period. Scientists indicate that a main reason for this increase in temperature is the greenhouse effect.

Generally, during day time the Earth gets heated up by sun rays. During night, heat is lost to space, so the Earth gets cooled. But, since the carbon dioxide gas and water vapour in the atmosphere absorb and retain a part of the heat released from the Earth, they help to keep the Earth warm. This is called the greenhouse effect. This effect creates favourable environment for the living beings on the Earth.

However, because of the increase in the concentration of greenhouse gases such as carbon dioxide, methane, Nitrogen dioxide sulfur dioxide, the temperature of the Earth is gradually increasing. In addition to the gases mentioned above, ozone and chlorofluorocarbons (CFC) also contribute to the greenhouse effect.

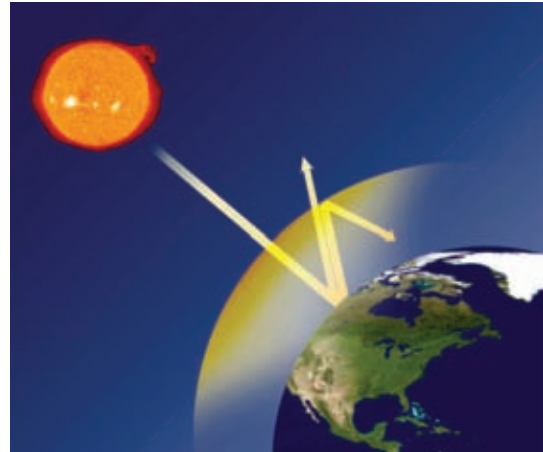


Figure 18.27 - Green house effect

### The ways by which greenhouse gases are added to the environment

- Release of carbon dioxide by volcanic eruptions, thermal power plants and combustion of fuels in vehicles
- Release of methane from heaps of garbage, marshes etc.
- Release of CFC from refrigerators, air conditioners etc.

### Global warming and cyclones

The graph in figure 18.28 indicates the change in the number of the incidence of cyclones in the world from 1850 to 2015.

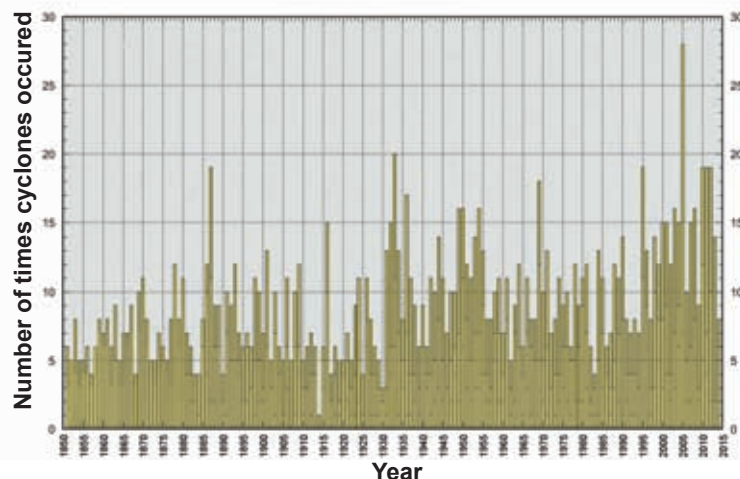


Figure 18.28 – Incidence of cyclones from 1850 to 2015

The above graph brings to light the fact that, the number of the events of cyclones in the world has gradually increased during this period.

Figure 18.29 is a histogram which depicts how the number of natural disasters changed during the period 1980-2010.

#### Number of disastrous events

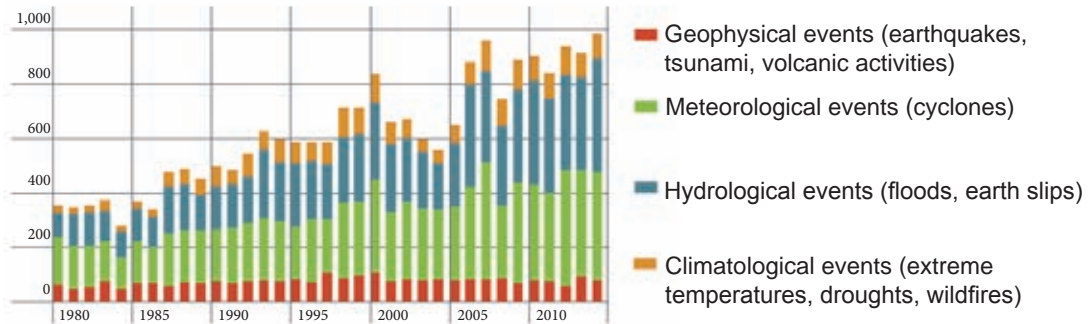


Figure 18.29 - Histogram which depicts the number of natural disasters during 1980-2010

The chart indicates that the number of natural disasters has gradually increased during this period.

From the above information it is clear that, there is a relationship between the increase in global warming and the increase in the number of natural disasters.



#### For extra knowledge

- During the period from 2000 to 2009, natural disasters have occurred three times more than the number of those occurred from 1980 to 1989.
- Globally, the number of natural disasters reported in 1970 was 78, whereas the number of those reported in 2004 was 348.
- During the period from 1980 to 2009, the number of natural disasters related to weather has increased by 80%.

#### What we can do to prevent the increase in global warming

- Forestation and conservation of forests
- Usage of public transport instead of private transport
- Consumption of more plant food and obtaining them from areas close to the residence
- Economizing electricity - using energy saving electrical appliances
- Reducing the amount of materials consumed daily
- Living a simple life style without using more materials
- Raising the awareness of others about the above facts



## Summary

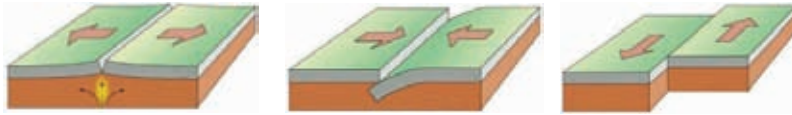
- The damage caused by natural disasters can be minimized by keeping vigilant over one's environment, use of standard safety methods and maintaining connection with media of communication.
- Because of the development of depressions in the atmosphere, cyclones and storms are created.
- Lot of damages to property and loss of lives have been brought about by cyclones from time to time in Sri Lanka.
- Earthquakes would be resulted when the crustal plates of the Earth move relative to one another.
- Tsunami is mainly caused by the lifting of oceanic water due to the earthquakes in the sea bed.
- Earthquakes and tsunami mainly occur in the regions associating with the borders of Earths' tectonic plates.
- In other countries wildfires break out due to natural causes. In Sri Lanka, the wildfires are occurred mostly due to human activities.
- It is considered that, the number of natural disasters increased due to the increase in global warming.

## Exercises

**(01) Select the correct or most suitable answer.**

1. Which ocean associated with the earthquakes and tsunami that occur mostly?
  1. Atlantic
  2. Pacific
  3. Indian
  4. Arctic
2. The factor /factors causing a tsunami is/are,
  1. Earthquakes
  2. Volcanic eruptions
  3. Fall of meteorites
  4. Above all

3. Which option indicates the tectonic plate movements shown in the following figures respectively.

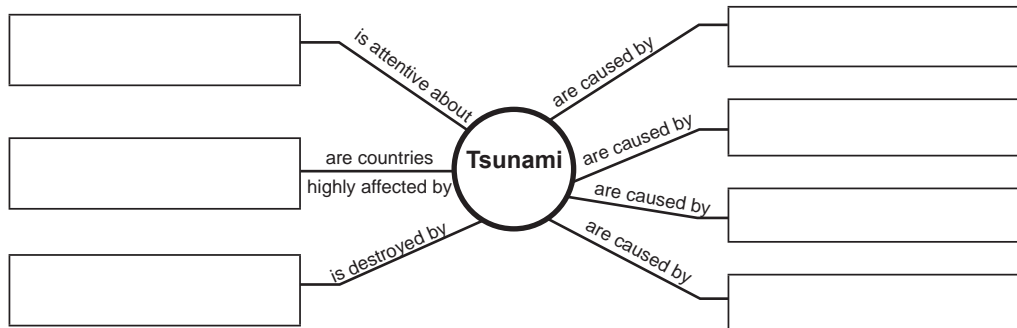


1. Convergent, divergent, slip border
2. Divergent, convergent, slip border
3. Slip border, convergent, divergent
4. Slip border, divergent, convergent

(02) Mark whether the following statements are true (✓) or false (×).

1. Mangroves near the sea shore reduces the speed of tsunami waves. ( )
2. Greenhouse effect has an influence on the rise of sea level. ( )
3. In deep sea, the height of tsunami waves is about thousand meters. ( )
4. Cyclones occur on the equator. ( )
5. The direction of spin of the cyclones occurring in the Northern hemisphere is anticlockwise. ( )

(03) Insert the words/phrases given below into the rectangular boxes of the following concept map as appropriate



Words/phrases

Volcanic eruptions, coastal environment, earthquakes, earthslips under sea, fall of meteorites, Chile, Indonesia, Japan, Geology and Mines Bureau

(04) Two identical ships A and B were sailing in the sea. When ship A was sailing in deep sea and ship B was sailing in shallow sea, only one ship was damaged by an earthquake erupted in a distant place of the sea bed.

1. What is the phenomenon resulted by the earthquake which caused the ship damage?
2. Which ship, A or B got damaged ?
3. Explain the reason why the ship you mentioned above got damaged while the other was not.

## Technical Terms

Cyclones	- ஐசீ ஐசீ	- சூறாவளி
Earthquakes	- ஐதீகதீப	- புவியதிர்வு
Tsunami	- ஐதீ	- சூனாமி
Wild fire	- லீதீதீ	- காட்டுத் தீ
Depression	- தீதீதீ தீதீதீ	- அழுக்க இறக்கம்
Storm surge	- தீதீதீ தீதீதீ	- சூழல் காற்று
Crust	- கதீதீ	- புவியோடு
Mantle	- தீதீதீ	- தீதீதீ
Core	- தீ	- அகணி
Tectonic plates	- தீதீ	- புவித்தீ
Convergent border	- தீதீதீ தீ தீ	- தீதீதீ தீ
Divergent border	- தீதீதீ தீ தீ	- தீதீதீ தீ
Slip border	- தீதீதீ தீ தீ	- தீதீதீ தீ
Seismometer	- தீதீதீ தீ	- புவியதிர்வுதீ
Seismograph	- தீதீதீ தீ	- புவியதிர்வு தீ
Asteroid	- தீ	- தீ
Wave length	- தீ தீ	- தீ
Amplitude	- தீ	- தீ
Focus	- தீ	- தீ
Epicentre	- தீ	- தீ
Seismic Waves	- தீ	- தீ