

Managing Tectonic Hazards

It's not possible to prevent earthquakes and volcanic eruptions from happening, but careful management can minimise the damage that they cause. Prediction is the most important aspect of this, as this gives people time to evacuate the area and make preparations for the event.

It is often LEDC countries that are hardest hit by the impact of earthquakes and volcanoes.

1. **Predicting and preparing for volcanoes**
2. **Predicting and preparing for earthquakes**
3. **Earthquakes and volcanoes in LEDCs**

Predicting and preparing for volcanoes

Unfortunately there is nothing that can be done to stop volcanic eruptions or earthquakes. Prevention is not an option.

This leaves two possible ways of **managing hazards** such as earthquakes and volcanoes:

1. Prediction
2. Preparation

1. Predicting eruptions

As a volcano becomes active, it gives off a number of warning signs. These warning signs are picked up by **volcanologists** (those who study volcanoes) and the volcano is monitored. The key techniques for monitoring a volcano are outlined in the table below.

Warning Signs	Monitoring Techniques
Hundreds of small earthquakes are caused as magma rises up through cracks in the Earth's crust.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging techniques and satellite cameras can be used to detect the heat around a volcano.
When a volcano is close to erupting it starts to release gases. The higher the sulphur content of these gases the closer the volcano is to erupting.	Gas samples may be taken and chemical sensors used to measure sulphur levels.

As technology improves, the techniques available for predicting and monitoring volcanic activity are becoming more and more accurate. Volcanoes such as **Mt. St. Helens in the USA** or **Mt. Etna in Italy** are closely monitored at all times. This is because they are active or have been active in recent years. This means that people can benefit from early-warning signs of an eruption. However, as well as prediction, people need to be prepared for an eruption.

2. Preparing for an eruption

A detailed plan is needed for dealing with a possible eruption. Everyone who could be affected by the eruption needs to know the plan and what they should do if it needs to be put into action.

- Planning for a volcano includes creating an **exclusion zone** around the volcano
- Being ready and able to **evacuate** residents
- Having an emergency supply of **basic provisions** such as food
- Funds need to be available to deal with the emergency and a good **communication system** needs to be in place

Predicting and preparing for earthquakes

Earthquakes are not as easy to predict as volcanic eruptions. However, there are still some ways of monitoring the chances of an earthquake:

- Laser beams can be used to detect **plate movement**.
- A **seismometer** is used to pick up the **vibrations** in the Earth's crust. An increase in vibrations may indicate a possible earthquake.
- **Radon gas** escapes from cracks in the Earth's crust. Levels of radon gas can be monitored; an increase may suggest an earthquake.

Many of the prediction techniques used to monitor earthquakes are not considered 100% reliable. Planning and preparing for an earthquake is therefore very important. As with volcanoes, there are many ways of preparing for an earthquake. These are outlined in the table below.

Preparing for Earthquakes:



People living in earthquake zones need to know what they should do in the event of a quake. **Training people** may involve holding **earthquake drills** and educating people via **TU** or **radio**.



People may put together **emergency kits** and store them in their homes. An emergency kit may include **first-aid items**, **blankets** and **tinned food**.



Earthquake proof buildings have been constructed in many major cities e.g The **Transamerica Pyramid** in **San Francisco**. Buildings such as this are designed to absorb the energy of an earthquake and to withstand the movement of the Earth.



Roads and **bridges** can also be designed to withstand the power of earthquakes.

Earthquakes and volcanoes in

Less Economically Developed Countries (LEDC's)

Less Economically Developed Countries (LEDCs) often suffer more from the effects of volcanoes and earthquakes than More Economically Developed Countries (MEDCs). This is because LEDCs have weaker communication systems, lower standards of building, together with limited funds to deal with either evacuation before the disaster, or to deal with the aftermath of the emergency. See the diagram below.

Communication may be difficult, which means that people are not well educated about what to do in the event of a volcanic eruption or an earthquake.



When a volcanic eruption or earthquake occurs, a lot of damage can be caused to homes and other buildings. This is because construction standards tend to be poor in LEDCs.



The collapse of buildings can cause high death tolls.



The task of evacuating people and setting emergency plans into action can be difficult due to limited funds and resources.



Clearing up after a tectonic hazard can be difficult. There may not be enough money to rebuild homes quickly and safely. Many people may live in emergency housing or refugee camps for a long while.