



Risky World - 'Geography Explained' Fact Sheet

Quality of life and life expectancy vary across the globe as a result of a number of risks. These hazards can be divided into natural disasters (e.g. tropical storms and earthquakes), man-made dangers (e.g. war and crime) and disease, which are often spread by a combination of physical conditions and human actions. The exact impact each of these risks have on a population depends on the country in which they live, with MEDCs generally able to 'protect' their populations from the worst risks.

This fact sheet will investigate a number of the main natural hazards and human dangers.

Natural hazards

1) Weather Risks

Extreme weather is when the weather itself becomes a hazard. It can create dangerous, life-threatening conditions and cause widespread damage to buildings and the natural environment. Weather hazards can vary from extreme storms (Hurricanes) and strong winds (Tornadoes) to periods of immense dryness (drought) and extreme heat (heat waves).



<p>Hurricanes</p>	<p>Hurricanes, also called tropical cyclones (Indian Ocean) or typhoons (Pacific Ocean) are one of the most destructive forms of extreme weather. All tropical storms begin life as areas of low pressure around the equator. When the sun heats the ocean to high temperatures (above 27 degrees centigrade) the air above it warms and becomes saturated with evaporated moisture. As the hot air rises, trade winds cause the moist air to spin inwards. The rising air cools, the moisture condenses, and huge cumulo-nimbus thunderclouds form. When the spiralling wind reaches a sustained speed of above 75 miles an hour, the storm is classified as a Hurricane.</p> <p>Most hurricanes start their journey as convectional storms off the coast of West Africa, near Cape Verde. Due to the spin of the earth they travel north westwards, towards the Caribbean, Gulf of Mexico and the USA, gaining energy and strength from the warm tropical waters. They quickly lose strength when they reach land. Most hurricanes last for around 10 days.</p> <p>The primary effects of tropical storms are sustained strong winds, torrential rainfall, and storm surges. Associated primary effects include localised tornadoes (and waterspouts), widespread flooding, and landslides as hill slope soils become saturated. MEDCs affected by Hurricanes have invested in technology to help them predict when and where hurricanes will strike, providing authorities with the time to organise evacuations. Few LEDC have the technology needed to forecast tropical storms and most lack the communications infrastructure required to inform the population in time.</p>																											
<p>How Hurricanes are measured: The Saffir Simpson Scale</p>	<table border="1"> <thead> <tr> <th>Scale</th> <th>Damage</th> <th>Wind Speed</th> <th>Storm Surge</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Minimal</td> <td>74-95 mph</td> <td>1-2 metres</td> </tr> <tr> <td>2</td> <td>Moderate</td> <td>96-110 mph</td> <td>2-3 metres</td> </tr> <tr> <td>3</td> <td>Extensive</td> <td>111-130 mph</td> <td>3-4 metres</td> </tr> <tr> <td>4</td> <td>Extreme</td> <td>131-155 mph</td> <td>4-6 metres</td> </tr> <tr> <td>5</td> <td>Catastrophic</td> <td>156 mph +</td> <td>6 metres +</td> </tr> </tbody> </table>				Scale	Damage	Wind Speed	Storm Surge	1	Minimal	74-95 mph	1-2 metres	2	Moderate	96-110 mph	2-3 metres	3	Extensive	111-130 mph	3-4 metres	4	Extreme	131-155 mph	4-6 metres	5	Catastrophic	156 mph +	6 metres +
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What does a hurricane need?





<p><i>Case Study:</i> <i>Katrina,</i> <i>August 2005</i></p>	<p>Much of the US coastline from Louisiana to Alabama was devastated by Katrina. It arrived as a category 4 storm with winds of over 140 mph and a storm surge of 6 metres. The system of levees and sea walls constructed to protect the low-lying New Orleans were breached leading to large parts of the city being flooded. Almost 1200 people drowned in the flood-waters and over a million people were made homeless. 30,000 national guard and \$50 billion were made available for the rescue and recovery programme.</p>																	
<p>Flooding</p>	<p>Floods are one of the most common environmental hazards. In an ‘average’ year, floods account for about a third of natural disasters, more than half the deaths caused by natural disasters, and appropriate a third of the economic cost. The most vulnerable environments are low-lying flood plains, river estuaries and flat coastal zones. A flood occurs when a river is unable to contain all the water within its channel. This can result from a range of physical (e.g. heavy / continuous rainfall or melting snow) and human causes (e.g. climate change, urbanisation, and deforestation). Although Britain is not usually associated with extreme weather conditions, floods do occur every four to five years. The frequency and extent of UK flooding has increased over the past 50 years due to urban expansion on floodplain regions. Urban growth has increased flood risk by creating impermeable surfaces that water cannot soak into and by channelling rainwater quickly into nearby rivers through a network of drains and gutters. In the UK, the number of properties at risk from flooding is now estimated to be 2.2 million. The risk of flooding can be reduced by a range of flood prevention schemes. Hard schemes involve major construction work (e.g. dams, overflow channels, & concrete lining); although these methods can significantly reduce flood risk, they are normally associated with environmental degradation as habitats and landscapes are often destroyed. Soft schemes (e.g. afforestation) are less effective but often enhance environments and promote wildlife. Hard schemes are often expensive to build and maintain, putting them out of the reach of LEDCs.</p>																	
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<p><i>Case Study:</i> <i>Bangladesh</i> <i>2004</i></p>	<p>Over 70% of Bangladesh is flat, low-lying land less than 5 metres above sea level. From May to August the country receives heavy rains (Monsoon) and is frequently affected by tropical cyclones which sweep up the Bay of Bengal. The annual floods (barsha) cover 20% of the country, roughly every five years a major flood occurs (bonna). In 2004 torrential monsoon rains resulted in 60% of the country lying underwater. 760 people died and 30 million were displaced or made homeless. Tens of thousands suffered from water-borne infections and diseases. Twenty million relied on food aid for up to a year after the floods, which destroyed crops, food stores, and killed livestock. As Bangladesh is an LEDC, it can not afford expensive flood defence systems so instead efforts have been made to reduce the impact of flooding – houses have been built on stilts and food stores have been constructed on high land.</p>
<p>Drought</p>	<p>More than one third of all the land is either arid or semi-arid. A desert is classified as an area with rainfall less than 250mm per annum. As deserts are so dry few people choose to live in them and farming is rarely attempted. On the edges of deserts rainfall is often marginally higher, often leading to the potential for farming. Unfortunately, rainfall in these regions is often unreliable. When the rains fail, the consequences for farmers are often devastating.</p> <p>The word ‘drought’ is used to describe a period of unusually low rainfall. Droughts are often characterised by a number of life-threatening dangers including wildfires and famines. Droughts occur across the globe in all types of environment; Britain experiences a drought roughly once every 15 years. However the consequences of droughts in MEDCs are usually minimal with food and water supplies simply brought in from unaffected areas. Countries in the Sahel are less fortunate, when droughts hit these already poor nations thousands are threatened through malnutrition and starvation.</p>
<p>Tornadoes</p>	<p>A tornado is smaller but more violent than other tropical storms. They start over land and the winds whirl at fantastic speeds of up to 600 mph. Where the base of the funnel touches the ground, almost complete devastation occurs. About once every two years Britain experiences a ‘weak’ tornado, in contrast there are usually between 500 and 700 each year recorded in the USA where they are also known as Twisters.</p>



	<p style="text-align: center;">TORNADO ACTIVITY IN THE UNITED STATES* Summary of Recorded F3, F4, & F5 Tornadoes Per 3,700 Square Miles (1950 - 1998)</p> <p style="text-align: right;">Number of Recorded F3, F4, & F5 Tornadoes per 3,700 Sq. Mi.</p> <ul style="list-style-type: none"> < 1 1 - 5 6 - 15 16 - 25 > 25 <p style="text-align: center; font-size: small;">* Based on NOAA, Storm Prediction Center Statistics</p>
<p>Avalanches</p>	<p>An avalanche is created when a mass of snow becomes overloaded by a heavy fresh fall, or by a rapid rise in temperature which causes the bond between the snow and the slope to be weakened. The snow mass becomes unstable, the weight of a single skier can break the delicate balance and initiate an avalanche. An avalanche usually starts from a single point but gains speed and size as it moves downhill. Fully developed, an avalanche can weigh one million tons and travel at speeds of 250 mph. They are most frequent due late winter / early spring when temperatures are rising and fresh snow is moist and heavy.</p>

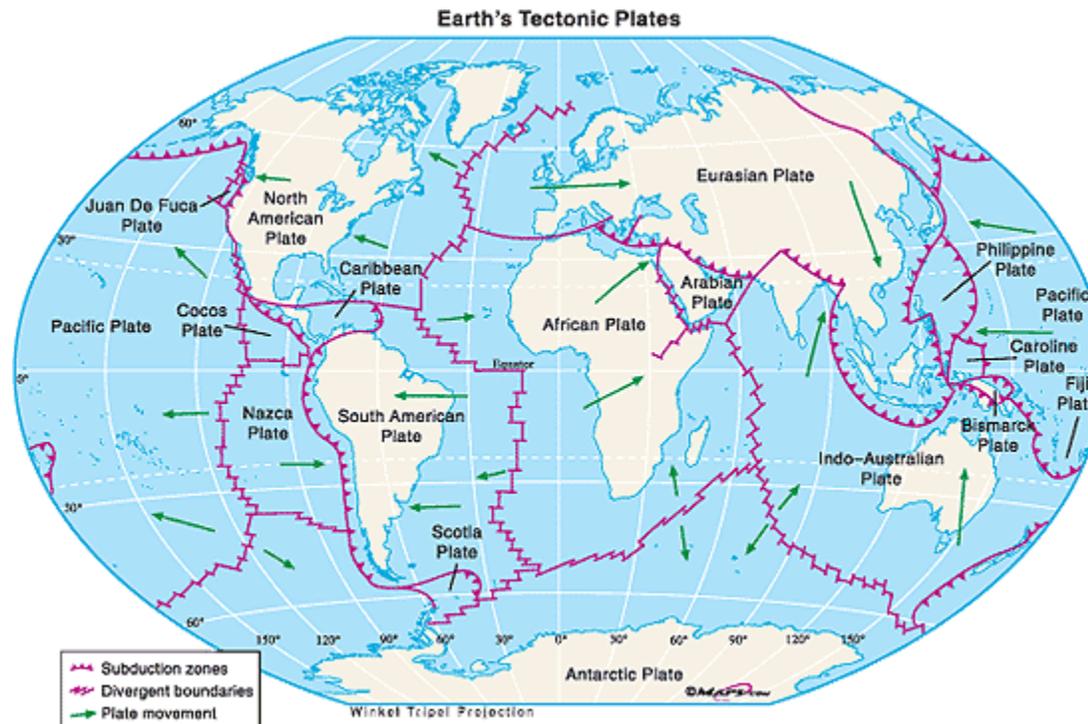




2) Tectonic Risks

Tectonic hazards (earthquakes and volcanoes) are caused by the movement of crustal plates. The crust is the thin rocky outer skin of the planet; it is not in one piece but is broken into numerous slabs of varying sizes, known as plates. These plates float on the molten mantle. Heat from the centre of the earth (core) creates huge convection currents which push and tug on the plates above causing them to move. Most plates move only a few millimetres each year.

A plate boundary is where the two plates meet. There are four types of plate boundary, all are affected by seismic activity but only destructive and constructive boundaries are associated with volcanic activity.





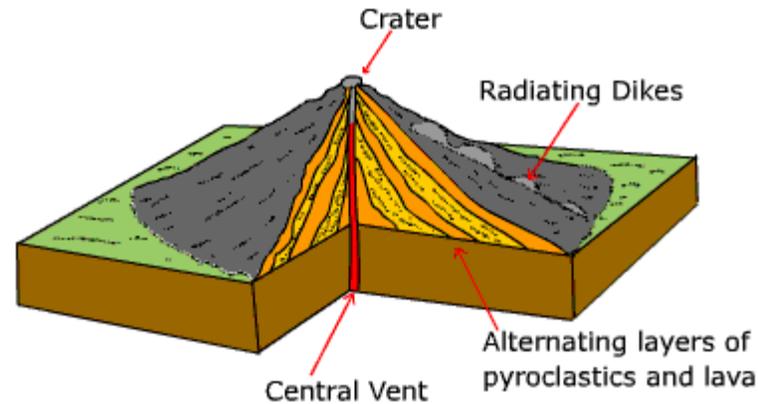
<p>Earthquakes</p>	<p>Plate movements are rarely smooth. Pressure builds along the boundary until it is released in sudden movements, known as earthquakes. It is estimated that there are over 150 000 earth movements each year, however, most of these are so weak they can only be recorded using seismographs. Approximately 20 to 50 earthquakes a year are powerful enough to cause serious damage and loss of life. Although scientists have yet to accurately predict an earthquake, our understanding of the hazard has enabled MEDCs to introduce a range of preventive measures aimed at limiting damage and death when earthquakes occur. Building regulations in California and Japan (two regions frequently affected by earthquakes) have led to the construction of so-called earthquake proof buildings which have been designed to survive tremors by bouncing on shock-absorbers or swaying 'in-time' with the quake.</p>	
<p><i>Case Study: Kashmir October 2005</i></p>		<p>On the 8th of October 2005 a massive earthquake struck the Kashmir province of Pakistan. The earthquake measured 7.6 on the Richter scale and lasted for 60 seconds, during which time buildings collapsed, roads cracked and bridges toppled (primary effects). The crippled region was shaken by a number of powerful aftershocks, some reaching 6 on the Richter scale, over the next 48 hours. When the 'dust' settled 79,000 people had been killed, over 100,000 were injured, and an estimated 3.3 million homes had been destroyed. The overall cost of damage is expected to reach \$5 billion.</p> <p>The death toll rose over the following months as diseases (mainly diarrhoea) spread from contaminated water supplies. Many others died from pneumonia as the homeless survivors were forced to spend the harsh winter in inadequate shelter. Many families only had thin tents to protect them from sub-zero temperatures and heavy snowfall. Deaths due to secondary effects were lower than many originally feared as international aid enabled a massive helicopter response, flying in essential supplies and bringing the ill and injured out (at an estimated cost of \$500,000 a day).</p>



Volcanoes

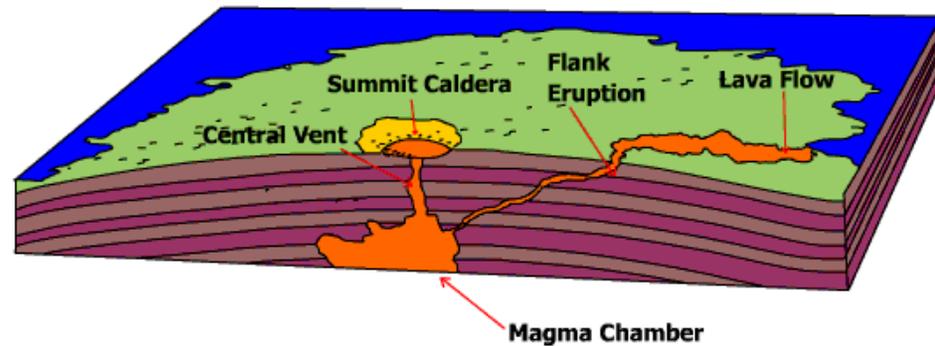
Volcanoes form where molten rock escapes onto the earth's surface. This can occur at both destructive and constructive boundaries. At destructive boundaries the molten rock is often thick and slow moving (acidic lava) creating steep sided volcanoes (composite) and leading to explosive eruptions which often destroy settlements and endanger life. Hazards associated with this type of eruption include pyroclastic flows, superheated mudflows (known as lahars), and huge ash clouds. The lava at constructive boundaries is usually thin and runny (basic) and flows easily and quickly away from the vent. The resultant volcano often has shallow sides (shield) and eruptions are rarely explosive.

Composite



Volcano

Shield



Volcano



Case Study:
Mt Pinatubo
1991

Mount Pinatubo is in the Philippines, not far from the capital Manila. The eruption began on the 12th June but the main explosion occurred three days later. During the initial eruption thick molten rock 'plugged' the vent, leading to a massive build-up of pressure which eventually blew the top off the mountain, sending ash clouds high into the sky and pyroclastic flows down the mountain at speeds of up to 100 mph. Heavy rain in the week following the eruption turned the deposited ash into huge mud flows which covered whole settlements and set like concrete.

Some 200 000 buildings were destroyed, collapsing under the weigh of up to 4 metres of ash. Farm land was destroyed and over 1 million farm animals killed. There was no clean water or power, leading to disease. In the months that followed the eruption 700 people died as a result of food shortages, disease and flooding. The eruption had a global impact with global temperatures falling by a degree centigrade as the ash in the atmosphere reflected the sun's energy back into space.



<p>Tsunamis</p>	<p>A Tsunami is a giant wave, or series of large waves, created by underwater seismic activity and/or submarine landslides. Tsunamis are relatively unusual as the creating earthquake has to be both powerful and shallow to displace a large enough body of water.</p>		
<p>How tsunamis are made in pictures</p>			



<p><i>Case Study: Asian Tsunami December 26th 2004</i></p>	<p>The earthquake happened in the Indian Ocean, approximately 175 miles west of the Indonesian island of Sumatra. The focus (point where the earthquake starts) was very shallow, only 30 km below the sea bed. It measured 9.0 on the richter scale making it one of the strongest tremors every recorded. The earthquake lasted for between 3 to 4 minutes, lifting the sea floor by several metres. The power released has been calculated to be equal to 23,000 atomic bombs.</p> <p>The earthquake created a Tsunami, a series of giant waves which quickly moved towards the eastern and western edges of the Indian Ocean. In parts of Indonesia, Thailand and Sri Lanka the level of destruction was extreme, the waves destroyed coastal settlements and left tens of thousands missing or dead, the final death toll surpassing 150,000.</p> <p>The response to the disaster around the world was swift. Countries, mainly MEDCs, quickly pledged funds to help finance the rescue and repair programmes – Britain pledged a sizable donation of \$285 million. As well as money many countries provided medical and military support, such as medicine, helicopters, and specialist staff. In affected areas, aid organisations set up shelters for the homeless and temporary field hospitals.</p>
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Human Dangers

1) War & Conflict

The United Nations defines "major wars" as military conflicts inflicting 1,000 battlefield deaths per year. The new millennium began with much of the world consumed in armed conflict or cultivating an uncertain peace. As of mid-2005, there were eight Major Wars under way [down from 15 at the end of 2003], with as many as two dozen "lesser" conflicts ongoing with varying degrees of intensity.

Most of these are civil or "intrastate" wars, are fuelled by racial, ethnic, or religious animosities rather than ideological fervour. Most victims are civilians, a feature that distinguishes modern conflicts. During World War I, civilians made up fewer than 5 percent of all casualties. Today, 75 percent or more of those killed or wounded in wars are non-combatants.

Africa, to a greater extent than any other continent, is afflicted by war. Africa has been marred by more than 20 major civil wars since 1960. Rwanda, Somalia, Angola, Sudan, Liberia, and Burundi are among those countries that have recently suffered serious armed conflict.

War has caused untold economic and social damage to the countries of Africa. Food production is impossible in conflict areas, and famine often results. According to the Global Hunger Index, developed by the International Food Policy Research Institute (IFPRI), of the 12 countries with the highest levels of hunger, nine were affected by civil wars or violent conflicts.





2) Crime

Crime is another major human factor that can affect quality of life and, in some cases, life expectancy. A "snapshot" of crime recently showed that in England and Wales more than 16,500 crimes are reported each day - one every five seconds. In contrast, more than 5,400 people were arrested each day - that's one every 15 seconds. Although these figures may at first appear scarily high, the long term picture is an improving one. Crime in many MEDCs is actually falling. In the United States, for example, the 2005 violent crime rates were less than half those of the peak year, 1994. England and Wales experienced a 44% drop in all forms of crime between 1995 (when crime peaked) and 2006.

Although domestic crime rates are in decline in some countries, organised international (or trans-national) crime has been on the increase. One example of this growth in global criminal activity is the illegal drugs industry, in 1997 the World Drugs Report estimated that organised drug trafficking was worth around \$400 billion annually, about 8% of world trade and equivalent to the world's textile industry.

Levels of international crime have rocketed since the early 1990s. The collapse of the Soviet Union allowed an assortment of state enterprise managers, government bureaucrats, party officials, military officers under the old regime to take advantage of the opportunities created by liberalisation. Consequently a number of African governments, who had previously relied on 'cold war' patron-client relationships saw a rapid fall in financial aid, resulting in some governments developing new sources of revenue through illegal or criminal ventures such as money laundering, smuggling (of arms, diamonds, timber, and drugs), and people trafficking.

Arguably, the most concerning global crime trend is the rapid increase in human trafficking which has occurred since the late 1980s. Everyday, women and children (mainly from Africa, SE Asia and Eastern Europe) are bought and sold, transported against their will and forced into lives of prostitution, pornography and slave labour. Life expectancy amongst this group is incredibly low, as lives are cut short because of disease, drug addiction, and violent abuse. This modern day slave trade is organised by crime bosses and is increasingly linked to the global drugs trade and international terrorism.