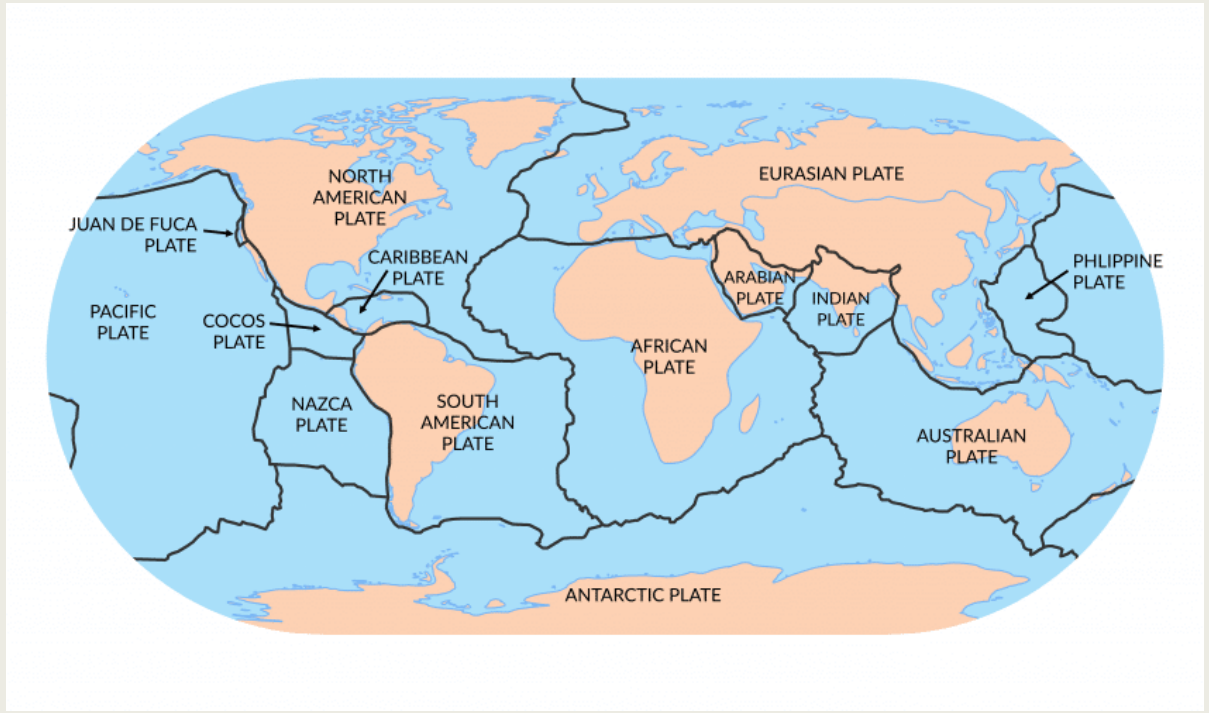
GCSE GEOGRAPHY PAPER 1 REVISION SECTION A

COURSE STRUCTURE AND KEY CASE STUDIES

SECTION A THE CHALLENGE OF NATURAL HAZARDS	SECTION B THE LIVING WORLD	SECTION C UK PHYSICAL LANDSCAPES
NATURAL HAZARD DEFINITION TECTONIC HAZARDS WEATHER HAZARDS CLIMATE CHANGE	ECOSYSTEMS- BRIEF TROPICAL RAINFORESTS COLD ENVIRONMENTS	UK LANDSCAPES- BRIEF COASTS RIVERS
TECTONIC: L'AQUILA 2009 AND NEPAL EARTHQUAKES WEATHER: TYPHOON HAIYAN, THE BEAST FROM THE EAST, UK HEATWAVE 2022	UK SMALL SCALE ECOSYSTEM: KIELDER FOREST RAINFORESTS: AMAZON, BRAZIL COLD: ALASKA	COASTS: HOLDERNESS COASTLINE, EAST YORKSHIRE RIVER: RIVER TEES

TECTONIC HAZARDS PAPER 1 SECTION A

TECTONIC HAZARDS



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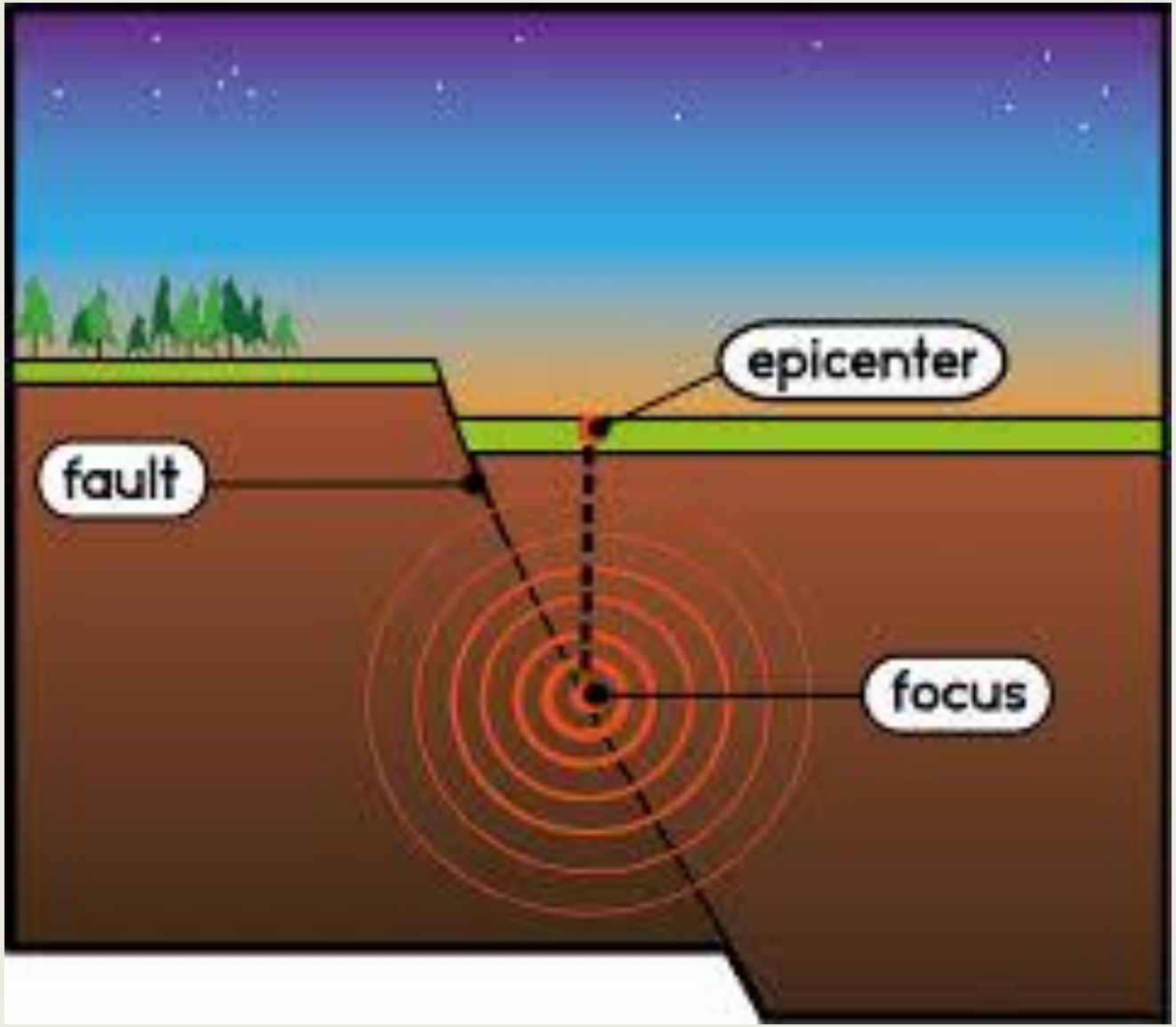
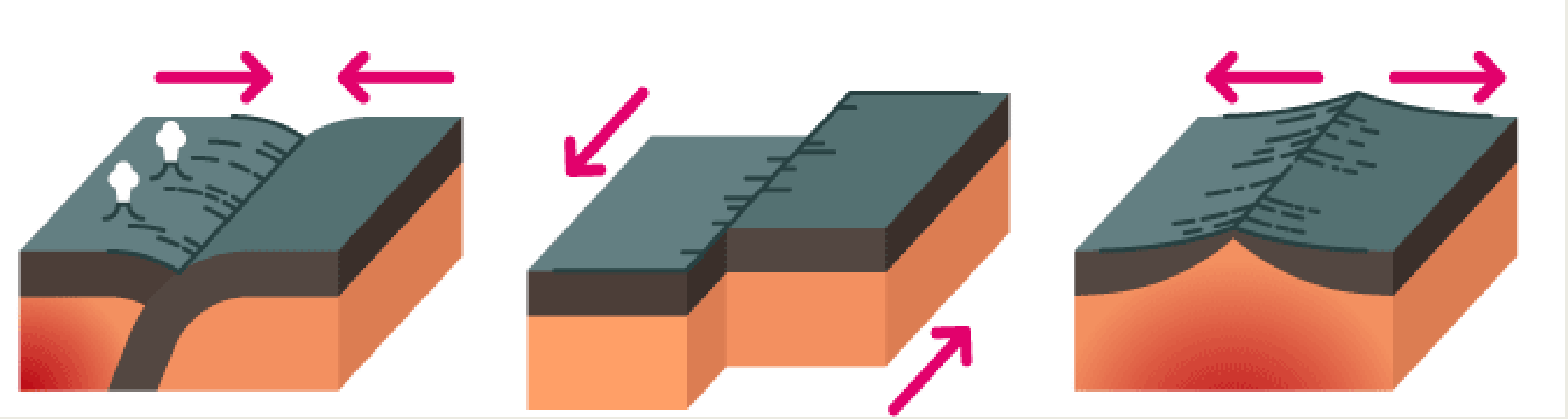


TECTONIC HAZARDS



Destructive	Conservative	Constructive

CASE STUDY 1- L'AQUILA 2009

Category	Key Facts
The Facts	• Occurred on 6 April 2009 3:32 AM • L'Aquila is in central Italy; • magnitude 6.3 (Mw); epicentre near the city of L'Aquila in the Abruzzo region; shallow focus (~10 km deep), increasing surface damage
Immediate Impact	• Approximately 309 people killed • over 1,500 injured • around 65,000 people made homeless • widespread collapse of older buildings and poorly constructed modern housing; • severe damage to L'Aquila's medieval city centre, including churches and heritage structures; • university buildings collapsed, affecting many students; • infrastructure such as roads and utilities disrupted.
Long-Term Impact	• Reconstruction took over a decade, with some areas still under repair years later • significant population decline as residents relocated permanently • local economy weakened, especially tourism and small businesses • lasting psychological effects including PTSD among survivors
Immediate Response	• Italian government declared a national emergency; rapid deployment of search and rescue teams, including firefighters and military; • temporary shelters (tent camps and hotels along the coast) provided for displaced residents; • hospitals set up emergency care systems; • international aid and assistance offered by several countries; • emergency services worked continuously in the first 48–72 hours.
Long-Term Response	• Government funded large-scale reconstruction projects, costing billions of euros; • development of new residential areas to rehouse displaced people; • restoration of historic buildings and cultural heritage sites; • controversial handling of rebuilding funds and delays led to public criticism; • improvements in seismic monitoring, hazard mapping, and public education;

CASE STUDY 2- NEPAL

Category	Key Facts
The Facts	• Occurred on 25 April 2015 at 11:56 AM local time; • magnitude 7.8 • epicentre near Gorkha, about 80 km northwest of Kathmandu; • shallow depth (~15 km); • followed by powerful aftershocks, including a 7.3 magnitude quake on 12 May.
Immediate Impact	• Approximately 9,000 people killed • over 22,000 injured • around 3 million people made homeless; • widespread destruction of homes, especially in rural areas; severe damage in Kathmandu Valley; historic landmarks destroyed; • landslides triggered in mountainous regions; • avalanches on Mount Everest killed climbers and destroyed base camp; • infrastructure (roads, electricity, water) heavily disrupted due to the avalanches
Long-Term Impact	• Slow and challenging reconstruction due to mountainous terrain and limited resources; • long-term homelessness and reliance on temporary shelters; • economic losses estimated at billions of dollars, impacting tourism and agriculture; • damage to cultural heritage sites affected national identity and tourism; • ongoing psychological trauma among survivors; • increased migration from rural areas to cities or abroad.
Immediate Response	• Nepalese government declared a state of emergency; • search and rescue operations carried out by army, police, and volunteers; significant international aid from countries such as India, China, the UK, and the USA; • helicopters used to reach remote mountain villages; emergency shelters, food, and medical aid distributed; • major challenges included blocked roads, remote locations, and aftershocks.
Long-Term Response	• National Reconstruction Authority established to coordinate rebuilding; • international funding and aid supported reconstruction of homes, schools, and infrastructure; • programs introduced to build earthquake-resistant housing; • restoration of UNESCO World Heritage sites began; • improvements in disaster preparedness and early warning systems; ongoing efforts to strengthen building regulations and community resilience.

“COMPARE IMPACT AND RESPONSE IN TWO AREAS OF CONTRASTING WEALTH” ITALY, HIC, NEPAL, LIC.

Category	L’Aquila (Italy, HIC)	Nepal (LIC)
Primary Effects	309 deaths; 1,500 injured; 65,000 homeless; extensive damage to historic buildings but fewer total casualties due to stronger building standards	9,000 deaths; 22,000 injured; 3 million homeless; widespread destruction of homes, especially poorly built rural housing
Secondary Effects	Limited secondary hazards; some landslides; economic disruption mainly localised; aftershocks caused further building instability	Severe landslides blocking roads and isolating communities; avalanches in the Himalayas (including Everest); food and water shortages; widespread infrastructure collapse
Immediate Response	Rapid, well-coordinated emergency response; strong national government support; search and rescue within hours; emergency shelters and hotels provided; effective healthcare response	Slower response due to difficult terrain and limited infrastructure; reliance on international aid; helicopters needed for remote areas; shortages of food, water, and medical supplies in early days
Long-Term Effects	Long but funded rebuilding process; population decline in city centre; economic recovery relatively stable; improved building regulations and awareness	Prolonged homelessness; slow reconstruction; long-term economic setbacks; loss of cultural heritage; increased poverty and migration
Long-Term Response	Government-funded reconstruction (billions of euros); rebuilding of historic sites; stricter enforcement of earthquake-resistant building codes; improved risk management systems	International aid-funded rebuilding; National Reconstruction Authority set up; focus on earthquake-resistant housing; ongoing challenges due to limited resources and governance issues

Key takeaway:
The HIC (Italy) experienced **lower casualties and faster, better-funded responses**, while the LIC (Nepal) suffered **greater loss of life and slower recovery**, largely due to differences in wealth, infrastructure, and preparedness.

EXAMPLE QUESTION: “ASSESS THE IMPACT OF AN EARTHQUAKE IN A LIC/HIC.”

I have studied the Nepal earthquake 2015 in a LIC, where immediate responses included search and rescue operations because many people were trapped under collapsed buildings, and international aid provided food, water, and medical care because Nepal did not have enough resources to cope alone. Long-term responses included rebuilding homes and infrastructure because large areas were destroyed, and improving building regulations to make structures more earthquake-resistant because this would reduce damage in future events. However, recovery was slow because Nepal is a low-income country with limited money and access to technology.

I have studied the L'Aquila earthquake 2009 in a HIC (Italy), where immediate responses included well-equipped emergency services carrying out search and rescue quickly because Italy has advanced infrastructure and trained teams, and temporary shelters were provided for thousands of homeless people because the government could respond rapidly. Long-term responses included rebuilding homes to a high standard because there was more funding available, and stricter building regulations were enforced because the government aimed to reduce future risk. Recovery was faster and more effective compared to Nepal because Italy is a high-income country with greater resources.

In summary, both LICs and HICs use immediate responses, such as search and rescue and providing basic needs, and long-term responses, such as rebuilding and improving infrastructure, because these actions are essential to reduce the impact of earthquakes. However, HICs like Italy can respond more quickly and effectively because they have more financial resources, advanced technology, and well-trained emergency services. In contrast, LICs like Nepal face slower recovery and greater reliance on international aid because of limited funding and weaker infrastructure. This shows that while both types of countries take similar types of action, the level of development greatly affects how successful and efficient their responses are.

WHY DO PEOPLE CHOOSE TO LIVE SOMEWHERE THAT IS KNOWN TO HAVE TECTONIC HAZARDS?

TOURISM	FAMILY	POVERTY	AGRICULTURE

EXAMPLE QUESTION: “EXPLAIN WHY PEOPLE CHOOSE TO LIVE IN AREAS OF TECTONIC HAZARD.”

People choose to live in tectonic risk areas for a variety of social and economic reasons. One reason is agriculture because volcanic areas have very fertile soils. Crops grow well due to the minerals in volcanic ash, so farmers can earn a good income and produce reliable food supplies.

Another reason is poverty because some people cannot afford to move away. They stay because they may not have the money to relocate or find jobs elsewhere, so they remain in dangerous areas even though they are at risk from earthquakes or volcanic eruptions.

Family and social ties are also important because people may have lived in these areas for generations. They do not want to leave because relatives, friends, and their community are there, so they stay despite the risks.

Tourism is another factor because tectonic landscapes attract visitors. Volcanoes, hot springs, create jobs in hotels, guiding, and local businesses, so people choose to stay because they benefit from these opportunities in making money.

Overall, people live in tectonic risk areas because the benefits, such as fertile land, job opportunities, and strong social ties, often outweigh the risks for them.

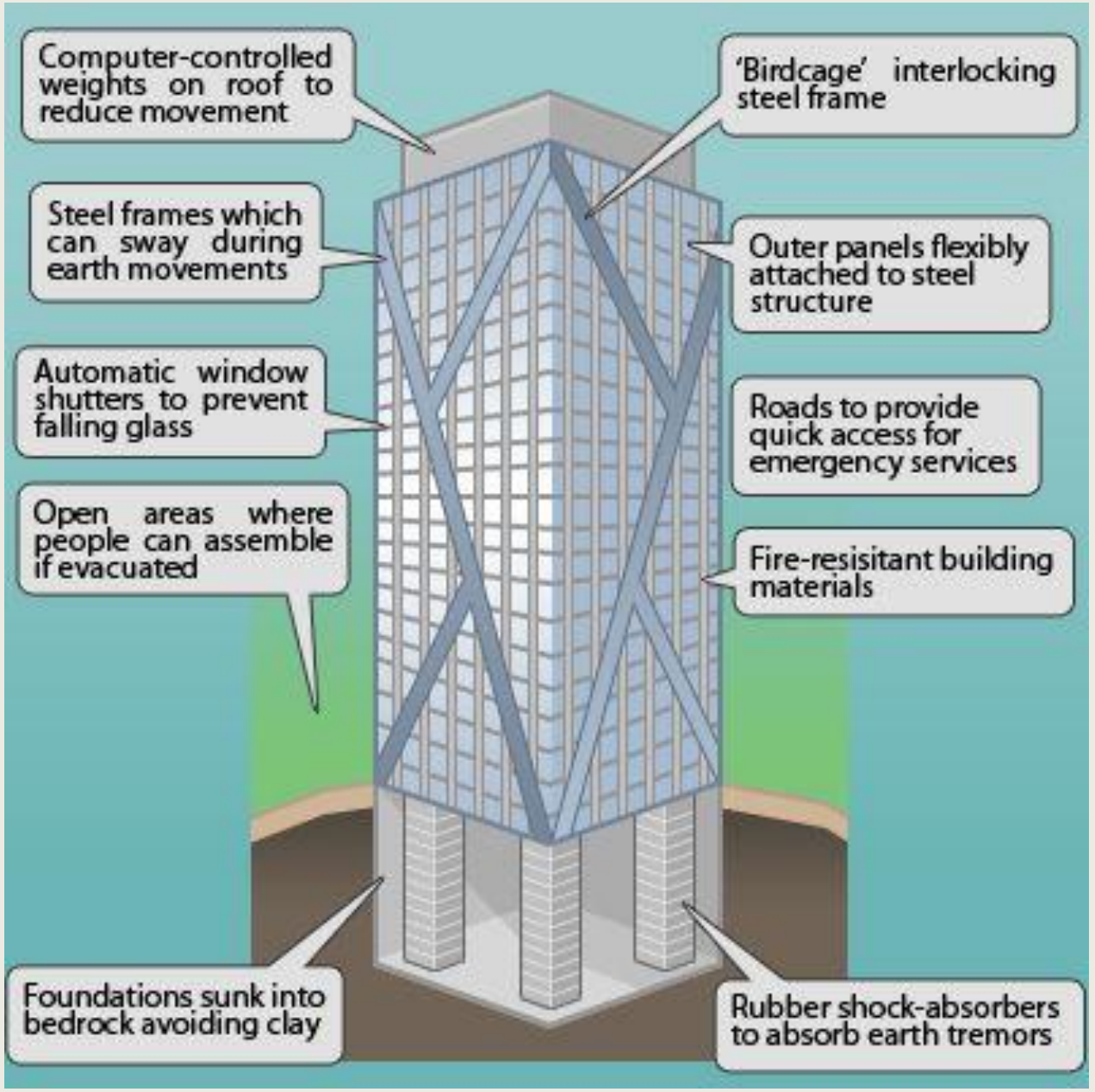
EARTHQUAKE PREDICTION

- Techniques for predicting and monitoring earthquakes include measuring ground surface changes (SHAPE),
- detecting ground tilting,
- monitoring minor earthquake clusters (PRE SHOCKS),
- tracking radon gas levels
- observing unusual animal behaviour, especially in toads.

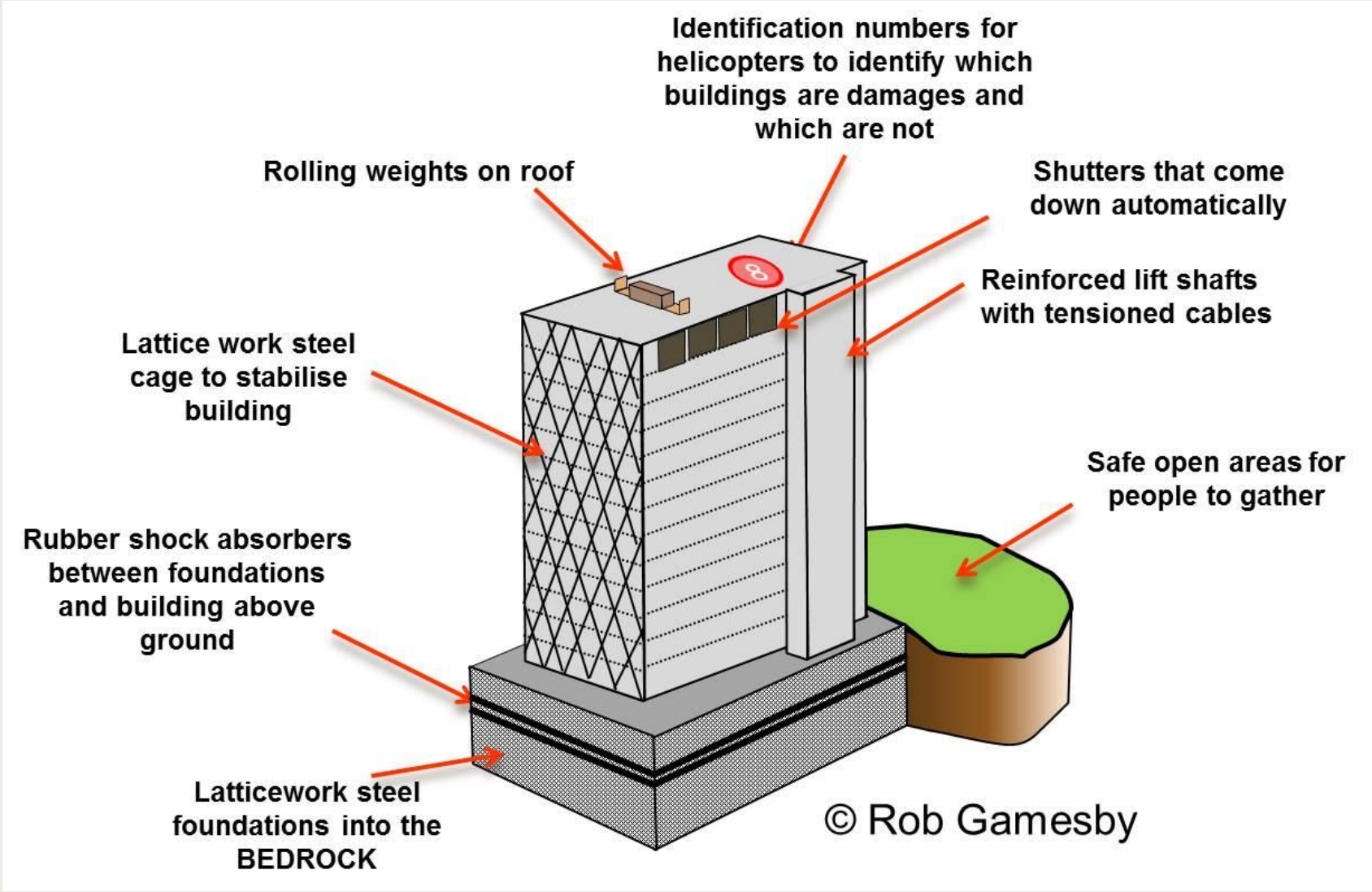
EARTHQUAKE PROTECTION

- Methods include issuing warnings and evacuations
- designing buildings to withstand tremors
- utilising remote sensing and GIS.

EARTHQUAKE PROTECTION



EARTHQUAKE PROTECTION



EARTHQUAKE PREPARATION

- Practise drills; Hospitals, emergency services and residents practise for an earthquake.
- They have drills in all public buildings so that people know what to do in the event of an earthquake.
- This helps to reduce the impact and increases their chance of survival.
- Have emergency packages- water, a radio, blankets

EXAMPLE QUESTION: “TO WHAT EXTENT IS PREPARATION THE BEST WAY TO REDUCE THE IMPACT OF AN EARTHQUAKE.”

Preparation can reduce the impacts of an earthquake ***to some extent*** because it ensures people and services know how to respond quickly. For example, earthquake drills and education mean individuals can safely evacuate with a reduction in injuries because people react correctly instead of panicking. Emergency kits and trained rescue teams also help because aid can be delivered faster after the event, limiting loss of life.

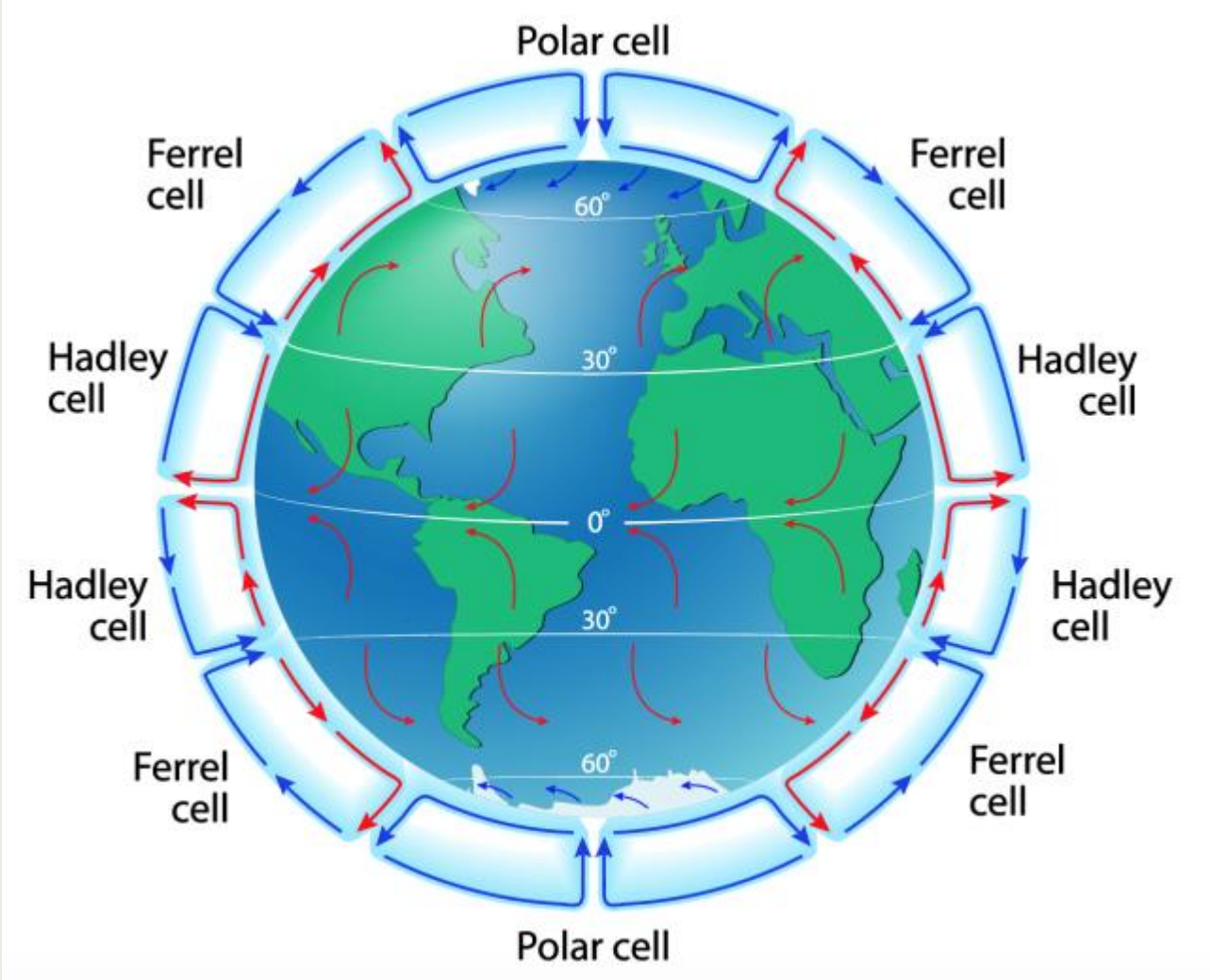
However, prediction is ***very limited*** in effectiveness because earthquakes are extremely difficult to predict accurately. Scientists can identify high-risk areas using past data and tectonic plate boundaries, but they cannot give precise timings. This means prediction only helps in long-term planning, such as avoiding building in high-risk areas, rather than providing immediate safety before an earthquake occurs.

Protection is the most effective method because it directly reduces damage the moment the earthquake happens. Buildings designed to be safe during an earthquake, such as those with rubber shock absorbers, flexible frames and automatic shutters to protect from falling glass. These are less likely to collapse. This protects both lives and infrastructure. These are more effective that preparation as they mean fewer deaths and less destruction.

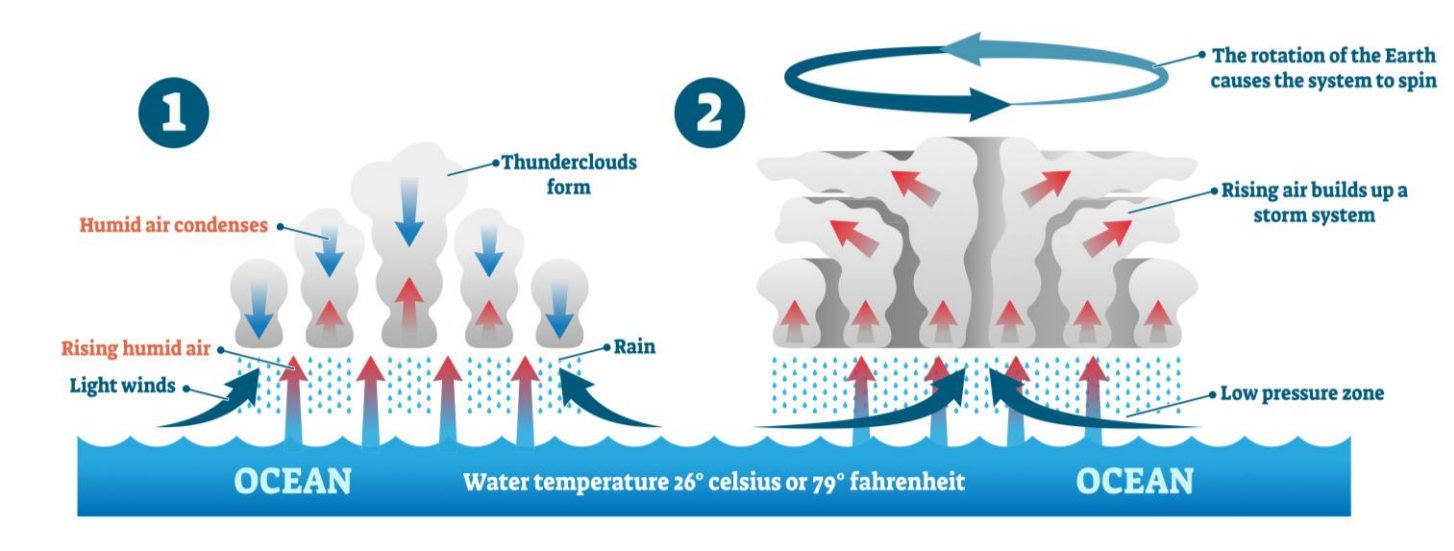
Overall, preparation is useful and prediction has some value for long-term awareness, but protection is the most effective because it reduces the immediate physical impacts of an earthquake and saves the most lives.

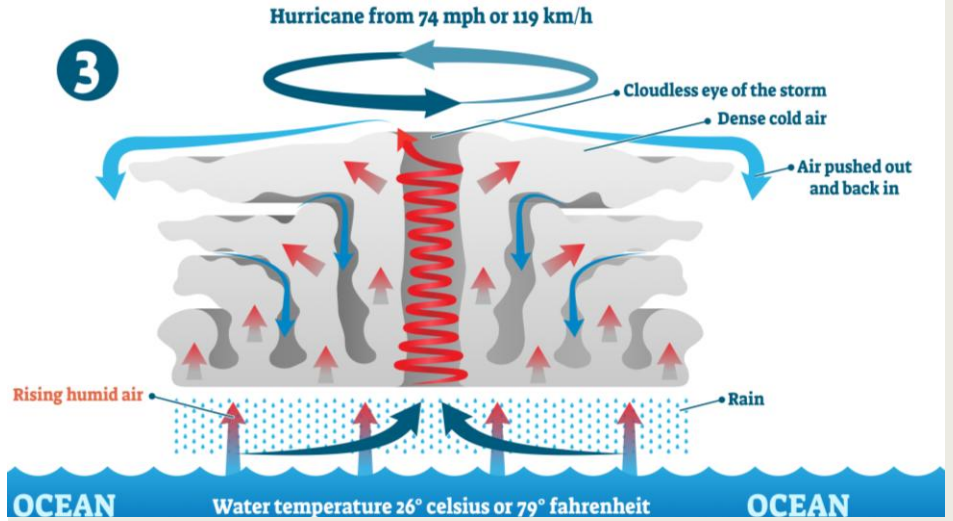
WEATHER HAZARDS

GLOBAL ATMOSPHERIC CIRCULATION.

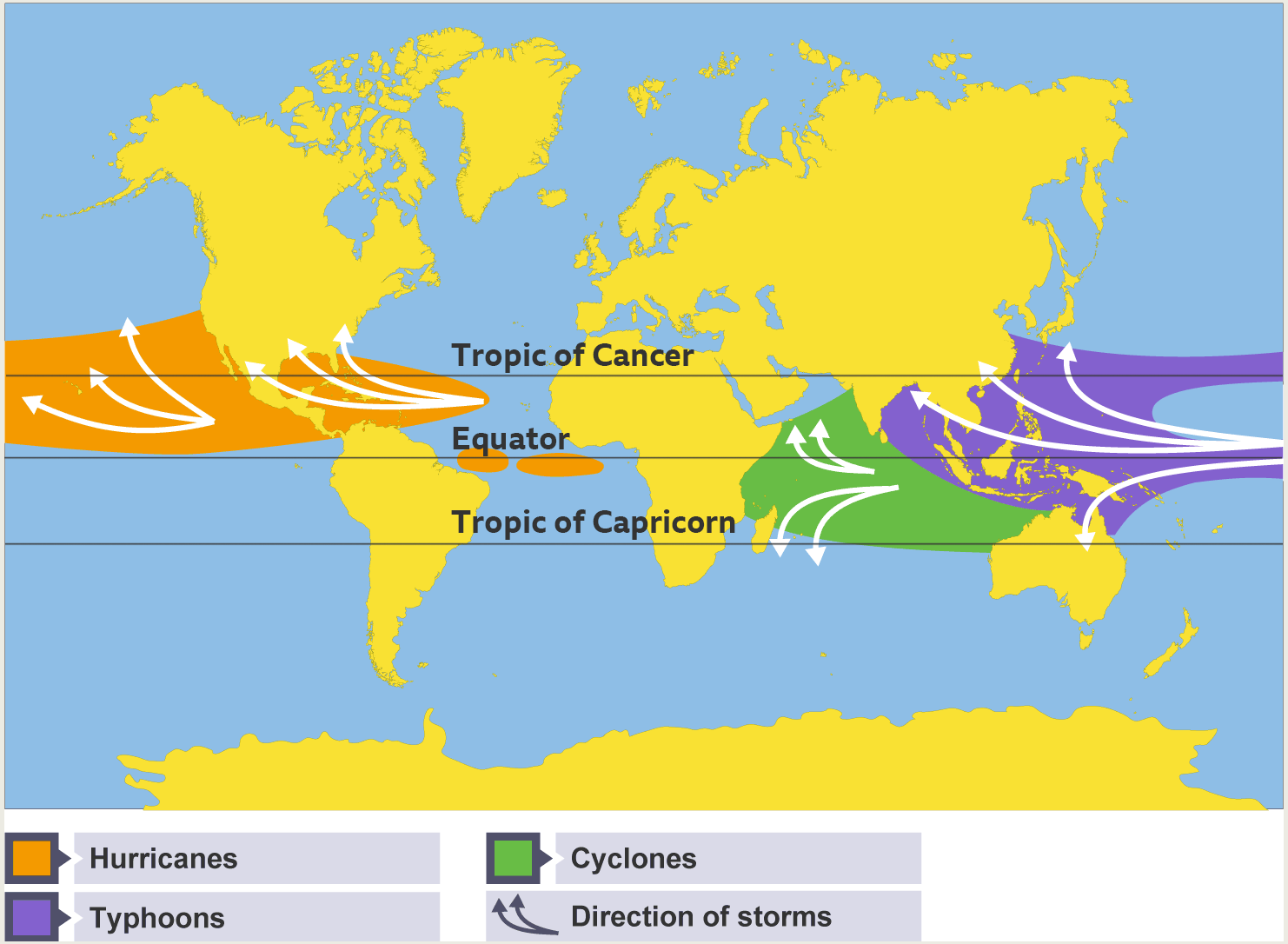


TROPICAL RAINSTORM FORMATION





TROPICAL RAINSTORM LOCATIONS



IMPACTED BY CLIMATE CHANGE

STRONGER WINDS

The intensity of tropical cyclones is expected to increase, leading to a higher proportion of severe tropical cyclones (and a decreased frequency overall). Cyclones may also intensify faster.

MORE RAINFALL

Warmer ocean temperatures and a warmer atmosphere mean that the rainfall associated with tropical cyclones will likely increase. Flooding is often the most destructive aspect of tropical cyclones.

INCREASED COASTAL EROSION & FLOODING

Rising sea levels mean that the storm surges that accompany tropical cyclones are even more damaging.

LENGTHENED SEASON, INCREASED RANGE

Climate change is likely to extend the cyclone season, and extend the range of cyclones southwards, where housing is not built to withstand cyclones.

+ THE TROPICS ARE ‘EXPANDED’

CASE STUDY: TYPHOON HAIYAN

Category	Details
Primary Effects	- Extreme winds (up to 315 km/h / 196 mph) destroyed homes and infrastructure. - Storm surge up to 6 meters flooded coastal areas. - Widespread destruction of crops, especially rice and coconut plantations.- - Loss of life: 6,300 confirmed deaths.
Secondary Effects	- Shortages of food, clean water, and medical supplies due to infrastructure damage. - Disease outbreaks, e.g., diarrhea and respiratory infections. - - Economic impacts: businesses destroyed, fishing industry disrupted. - - Displacement: millions left homeless, increasing reliance on aid.
Immediate Responses	- Emergency rescue and evacuation operations by local government and military. - International aid: UN, Red Cross, and NGOs provided food, water, medicine.- - Temporary shelters and field hospitals set up.- - Rapid assessment of damage and urgent needs.
Long-term Responses	- Reconstruction of homes, schools, and infrastructure. (CASH4WORK) - Development of disaster risk reduction strategies and early warning systems. - Livelihood support: rebuilding agriculture, fisheries, and local businesses. - International aid and government programs for resilience and community rehabilitation.- Improved urban planning to mitigate future typhoon damage.

Saffir-Simpson Scale: Haiyan's Category 5 rating indicates **catastrophic damage**, which aligns with the severe destruction observed in both primary and secondary effects.

EXAMPLE QUESTION: TO WHAT EXTENT DO PRIMARY IMPACTS OUTWEIGHT SECONDARY IMPACT OF A TROPICAL RAINSTORM.

I have studied Typhoon Haiyan, and I believe that primary impacts outweighed secondary impacts *to a large extent*. The primary effects, such as extreme winds reaching 315 km/h and storm surges up to 6 meters, caused immediate destruction of homes, infrastructure, and crops. These direct impacts were catastrophic *because* they led to the deaths of over 6,000 people and displaced millions, while also destroying schools, hospitals, and transport networks. The loss of livelihoods, particularly in fishing and agriculture, was severe because the storm directly damaged the resources that people relied on to survive.

However, secondary impacts, such as shortages of food, clean water, and medicine, disease outbreaks, and long-term economic disruption, were also significant. These occurred *because* the primary damage destroyed infrastructure and cut off access to essential services, therefore making recovery much more difficult. For example, widespread flooding and destroyed roads slowed the delivery of aid, which increased suffering in the immediate aftermath.

In conclusion, while secondary impacts worsened the situation and had serious long-term consequences, the primary impacts had the most immediate and devastating effect because they caused the initial destruction, loss of life, and breakdown of society. *Therefore*, in the case of Typhoon Haiyan, the direct consequences of the storm can be considered more significant than the secondary effects.

EXAMPLE QUESTION: EVALUATE THE IMPACT OF A TROPICAL RAINSTORM YOU HAVE STUDIED.

I have studied Typhoon Haiyan, and both primary and secondary impacts were extremely significant, but they affected communities in different ways. The primary impacts included extreme winds of up to 315 km/h, storm surges of 6 meters, and widespread destruction of homes, schools, hospitals, and infrastructure. These were catastrophic *because* they directly caused over 6,000 deaths and displaced millions, while also destroying crops and fishing boats, *therefore* immediately disrupting livelihoods.

The secondary impacts were serious but were largely a result of the primary impacts. For example, shortages of food, clean water, and medicine occurred because the storm destroyed transport networks and infrastructure, *therefore* slowing the delivery of aid. Disease outbreaks, such as diarrhea and respiratory infections, also followed *because* of the lack of clean water and sanitation. Additionally, the local economy suffered as businesses were destroyed and fishing and farming were disrupted, which had long-term effects on recovery and development.

In evaluating these impacts, the primary impacts were more immediately devastating because they caused deaths and destruction, which then triggered the secondary impacts. However, the secondary impacts prolonged suffering and hampered recovery, meaning that both types of impacts were critical to understanding the overall effects of the storm. *Therefore*, while primary impacts caused the initial catastrophe, secondary impacts had serious long-term consequences for affected communities.

REDUCING THE IMPACT OF TROPICAL RAINSTORMS

•**Monitoring (Using Technology):** Scientists use satellites, aircraft and ocean buoys to track storm development, intensity, and path. This continuous monitoring enables meteorologists to understand the storm's risk level.

•**Prediction (Forecasting):** Meteorologists use computer models to forecast a storm's path 3–5 days in advance. This allows authorities to map a "cone of uncertainty," identifying areas at high risk and providing time for evacuations

.

•**Protection (Infrastructure & Mitigation):** Measures include building flood defences (sea walls), fitting houses with storm shutters, strengthening roofs with hurricane straps, and raising buildings on stilts. Natural protection, such as restoring mangrove forests, is also used to absorb storm surge.

•**Planning (Preparation & Preparation):** Governments and communities create evacuation plans, build reinforced, raised storm shelters (especially in low-income countries), and train emergency services. Public education campaigns teach residents to prepare emergency kits and secure property

UK WEATHER HAZARDS

THE BEAST FROM THE EAST 2018

Category	Details
Causes	- Cold air from Siberia and Eastern Europe met the UK's milder Atlantic air, creating extreme winter conditions. - Strong easterly winds brought snow and icy conditions. - High pressure over Scandinavia allowed cold air to remain over the UK.
Social Impacts	- Travel disruption: road closures, cancelled trains and flights. - School closures affected millions of students. - Increased accidents and injuries due to icy roads and pavements. - Health risks, especially for vulnerable groups like the elderly.
Economic Impacts	- Businesses forced to close due to transport disruption- SLOWED PRODUCTIVITY - Retail losses as customers could not reach shops. - Supply chain disruption, including food and fuel deliveries- SLOWED PRODUCTIVITY - Costs of snow clearance, emergency services, and infrastructure repair.
Environmental Impacts	- Heavy snowfall and ice damaged trees and power lines. - Increased energy use for heating, leading to higher emissions. - Road salt and grit affected soil and waterways.
Management Strategies	- Pre-winter planning: UK Met Office warnings, emergency alerts, and guidance. - Snow and ice clearance (gritting roads, clearing pavements). - Emergency services prepared for accidents and rescues. - Public advised to stock essential supplies and avoid travel during severe conditions. - Long-term: improving infrastructure resilience and early warning systems.

THE 2022 HEATWAVE

Category	Details
Causes	- High pressure over Europe led to prolonged periods of hot, dry air from the south. - Climate change contributed to higher baseline temperatures, making heatwaves more intense. - Lack of rainfall and soil moisture amplified the heat.
Social Impacts	- Health risks: increased cases of heatstroke, dehydration, and respiratory issues, especially among the elderly and vulnerable. - Disruption to schools and workplaces due to extreme temperatures. - Public warnings to limit outdoor activity and stay hydrated.
Economic Impacts	- Reduced productivity due to unsafe working conditions outdoors. - Agriculture affected: crops suffered from drought, reducing yields. - Increased energy demand for air conditioning and cooling. - Transport disruptions: rail tracks warped due to heat, causing delays.
Environmental Impacts	- Drought conditions led to low river levels, affecting wildlife and water supply. - Wildfires in some areas damaged ecosystems. - Soil degradation and stressed vegetation.
Management Strategies	- Heat health alerts issued by the UK Met Office and NHS guidance for vulnerable populations. - Public advised to stay hydrated, avoid strenuous activity, and check on vulnerable neighbours. - Water usage restrictions in areas facing drought. - Long-term strategies: urban planning to reduce heat islands, planting more trees, and improving infrastructure resilience.

EXAMPLE QUESTION: TO WHAT EXTENT IS UK WEATHER BECOMING MORE EXTREME, USE AN EXAMPLE.

I have studied UK weather, and evidence suggests that it is becoming more extreme to a significant extent. One example is The Beast from the East in 2018, causing heavy snowfall, icy roads, and widespread travel disruption. This event had severe social impacts, including school closures and accidents, economic impacts such as business disruption and supply chain problems, and environmental effects like damage to trees and power lines.

Similarly, the Heatwave of 2022 brought record-breaking temperatures, drought, and wildfires, causing health risks, transport disruption, and agricultural losses. These events show that UK weather extremes are occurring at both ends of the spectrum because climate change increases the likelihood of unusually hot and cold conditions, therefore making extreme weather more frequent and intense.

However, while events like The Beast from the East and the 2022 heatwave were severe, they remain relatively rare, meaning not every year experiences extreme weather.

In conclusion, UK weather is becoming more extreme to a considerable extent because recent events show the serious social, economic, and environmental impacts of both cold and hot extremes, and climate change is likely increasing their frequency.