Answers

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Natural hazards: Review It! (p. 28)

1 A natural hazard is a naturally occurring physical phenomena, which poses a potential risk to human life and/or damage to property

2 The effects of a tropical storm can be reduced by: monitoring the weather through satellites to provide early warnings and protection through reinforcing windows or building houses on stilts to protect against flooding from storm surges.

3 Earthquakes and volcanoes mainly occur along plate margins.

4 The benefits of living near a volcano are fertile soil for farming, jobs in the mining industry and getting energy through geothermal power.

5 Tropical storms are formed through the following processes; firstly the air is heated above the warm tropical oceans, causing air to rise rapidly. This upward movement of the air draws up water vapour from the ocean's surface. The evaporated air cools as it rises, which causes it to condense to form large thunderstorm clouds. As the air condenses it releases heat, which powers the storm and causes more and more water to be drawn up from the ocean. Several thunderstorms can join together to form a giant spinning storm. It will officially be classified as a storm when winds reach 63km/h. As the storm moves across the ocean it develops in strength and then when the storm hits land it loses its momentum as friction with the land causes it to slow down and weaken.

6 Following a natural disaster there will be immediate, short- and long-term responses. Long-term responses may be seen to be more significant because they will then reduce the impacts of a natural disaster in the future. For example, following the Nepal earthquake 2015, the buildings were built to stricter codes so they would be less likely to be collapse in a future earthquake. Countries that are more prepared are often quick to respond to a disaster and they will have planned long term in case of a natural hazard. For example, after the L'Aquila earthquake in 2009, the DEC (Disasters Emergency Committee) did not need to provide any aid because Italy is a developed country. In a developing country, immediate responses are more significant than long-term responses, because the country may not be able to afford long-term planning, such as, hazard-resistant buildings. For example, after the Nepal earthquake in 2015, the DEC raised US$126 million to help support the country's redevelopment.

7 When two plates meet, the denser oceanic plate is subducted beneath the less dense continental plate. As the oceanic plate moves downwards it melts and this creates magma, which is less fluid than at a constructive margin. The magma can break through to the surface to form a steep-sided composite volcano. Eruptions are often very violent and explosive.

8 There are cyclical changes in solar energy outputs linked to sunspots. A sunspot is a dark patch on the surface of the Sun. The number of sunspots increases from a minimum to a maximum over a period of 11 years. The more sunspots there are, the more heat that is given off from the Sun, which can lead to higher temperatures on Earth.

9 Carbon dioxide accounts of approximately 60% of enhanced greenhouse emissions and concentrations have increased by 30% since 1840. Concentrations have increased due to the burning of fossil fuels in industry and power stations. Higher concentrations of carbon dioxide are also caused by transport, such as car exhausts, and due to deforestation.

10 There were a range of primary and secondary effects of the 2015 earthquakes in Nepal. A primary effect was the amount of people that were killed and injured in the earthquakes. In total 9000 people died and 22,000 people were injured. These levels were high as the earthquake happened in a developing country, which meant that buildings were not constructed to strict codes and so a large number of buildings were destroyed. Secondary effects included avalanches caused by the earthquake, including one on Mount Everest where 21 people were killed and one in the Langtang region which resulted in 250 people missing. Communication links were disrupted with landslides blocking roads. Overall, the earthquake had an extremely big impact on Nepal and cost US$5 billion in damage.

11 The 2014 Somerset floods in South West England caused a range of effects. Social damage to buildings, including 600 homes flooded and 16 farms evacuated, resulting in a large amount of people requiring temporary shelter. Economic: it caused £10 million worth of damage and approximately 14,000 ha of farmland were flooded, which affected farmers' livelihoods. Environmental: sewage contaminating the flood water and stagnant floodwater had to be re-oxygenated before being pumped back into the river.

12 There is evidence to support or to reject this statement. Comparisons and conclusions are difficult, due to the different magnitudes, timings and depths of different earthquakes. An HIC will have a more developed infrastructure than an LIC or NEE, which will be expensive to replace. The L'Aquila earthquake in Italy in 2009, for example, cost US$16 billion but the earthquakes in Nepal in 2015 cost US$10 billion, although the earthquakes in Nepal were of a higher magnitude. More developed countries may have made adaptions to buildings, or they may be built to better building laws, resulting in fewer deaths and injuries. In the Nepal earthquakes, 9000 people died and 20 000 people were injured, compared to the 6.3 magnitude earthquake in L'Aquila in Italy, where 308 people died and 1500 people were injured. However, the number of deaths may also be related to the level of development of a country, as HICs usually receive aid very quickly after an earthquake but it may take days for remote areas in LICs to receive aid due to damage to the communications infrastructure. The economic effects in a developed country will be higher but the social effects are generally more devastating in a developing country.

The living world: Review it! (p. 57/58)

Ecosystems

1 **a** One of: rock type, soil characteristics, or amount of water.

b One of: climate (rainfall, temperature, seasons), linked to distance from equator, oceans or mountain ranges.

2 Answers will vary according to case study. Here the example is Epping Forest, Essex.

a Two, such as: English lowland wood; pollarded trees with many thick branches; deciduous trees such as oak, beech, birch; 2500 ha in area; rare and vulnerable fungi; consumers such as grey squirrels and muntjac deer.

b One of: enclosing the forest prevents the deer from roaming and causing damage to the forest; The Epping Forest Act stopped pollarding but then the trees blocked out light from the ground level vegetation; busy roads around the forest kill deer; human recreation such as walking, horse riding and mountain biking disturb and damage wildlife; air pollution has affected the older trees.

c One of: powerful storms, such as the Great Storm of 1987; occasional droughts, such as 1976–77; a large deer population may lead to over grazing and damage to the forest structure.

Tropical rainforests

1 **a** The structure has three main layers: emergent (50 m tall), main canopy (35 m) and sub-canopy. The shrub and ground layers are not significant.

b The canopy layer, which consists of evergreen trees, blocks sunlight from reaching the ground layer. Without sunlight the vegetation cannot photosynthesise and grow.

2 **a** Most creatures live in the canopy layer.

b This is where most of the food is (fruits, nuts, nectar). The ground level is dark and plants do not grow well so there is little food at this level.

3 There is a wide range of adaptations as this is a very old ecosystem, relatively unaffected by world climate cycles, and so creatures have had a long time to evolve. Ideal growing conditions (hot, wet, sunlight) have enabled plants and animals to adapt to a balance with the elements and also with each other.

4 Any one of: extinction of species; disruption of food chains and webs; loss of genetic material which could have been useful to people; the ecosystem becomes more fragile and less resistant to change (e.g. in climate).

5 **a** The soil is exposed to erosion, possible local flooding, natural vegetation unable to regrow and loss of local biodiversity.

b The absorption of CO_2 is greatly reduced, so it is not stored and more remains in the atmosphere, increasing the 'greenhouse effect'. Loss of global diversity. Loss of potential health products/cures.