

The Challenge of Natural Hazards

Natural Hazards

Key concepts and definitions:

Natural hazard - a natural process which could cause death, injury or disruption to human lives or property.

Natural disaster - a natural hazard that has actually happened

Hazard risk - the probability of people being affected by a hazard in a particular area. - this is influenced by the vulnerability and capacity to cope of a population and the type of natural hazard.

Magnitude - the size and severity of a hazard.

Frequency - how often a natural hazard occurs

Primary effects - the immediate impacts caused by the hazard itself

Secondary effects - impacts that happen later on, often as a result of the primary effects

Immediate response - a response in the days immediately after a disaster has happened

Long term response - a response in the weeks, months, years after a disaster

Tectonic Hazards

Key concepts and definitions:

Plate margin - the place where tectonic plates meet

Destructive margin - where two tectonic plates are moving towards each other

Constructive margin - where two plates are moving away from each other

Conservative margin - where two plates are moving side by side at different speeds.

Focus - the point where the earthquake starts

Epicentre - the point of the earth's surface straight above the focus

Monitoring - using scientific equipment to detect warning signs of events

Prediction - using historical evidence and monitoring,

Protection - designing buildings that will withstand tectonic hazards

Planning - identifying and avoiding places most at risk

Key Case Studies:

Chile - In 2010 an 8.8 magnitude earthquake hit the high-income country

Nepal - In 2015 a 7.8 magnitude earthquake hit the low-income country

Weather Hazards

Key concepts and definitions:

Global atmospheric circulation - transfer of heat from the equator to the poles by the movement of air

Coriolis effect - the apparent curve of winds across the Earth's surface due to Earth's rotation

Depression - area of low air pressure

Anticyclone - area of high air pressure

Tropical storm - a localized, very intense low-pressure wind system, forming over tropical oceans and with winds of hurricane force.

Hadley cell - The largest cells that extend from the equator to between 30 and 40 degrees north and south.

Ferrell cell - occurs at higher latitudes (between 30 degrees and 60 degrees N and 30 degrees and 60 degrees S)

Key Case Studies:

Philippines - Typhoon Haiyan, 2013

UK - Somerset Levels Flooding 2013/14

Climate Change

Key concepts and definitions:

Climate change - Refers to a large-scale, long-term shift in the planet's weather patterns and average temperatures.

Global warming - The long-term warming of the planet's overall temperature.

Greenhouse effect - A process that occurs when gases in Earth's atmosphere trap the Sun's heat.

Enhanced greenhouse effect - where the natural process of warming caused by solar radiation and greenhouse gases is heightened by human factors.

Mitigation - The action of reducing the severity, seriousness, or painfulness of something

Adaptation - the process of adjusting to new climatic conditions

Carbon capture - the trapping of carbon dioxide at its emission source, transporting it to a storage location (usually deep underground) and storing it.

Key Case Examples:

Adapting to sea level rise in the Maldives

Water rations in South Africa

The Living World

Ecosystems

Key concepts and definitions:

Ecosystem - A community of plants and animals that interact with each other and their physical environment

Producer - A plant in an ecosystem that converts energy from the sun in a process called photosynthesis to produce sugars (glucose).

Consumer - A living thing in an ecosystem that gets its energy and the raw materials it needs by eating plants or other animals that have eaten plants.

Food chain - A chain with three or four links between plants and animals in an ecosystem that rely upon one another as their source of food.

Food web - A complex web of different food chains between plants and animals in an ecosystem.

Nutrient cycle - A set of processes where organisms take the minerals necessary for growth from the soil or water, before passing them on through the food chain and then back to the soil and water.

Decomposer - An organism or plant, e.g. a soil bacterium, microbes, fungus, or invertebrate, which decomposes organic material in an ecosystem.

Biotic - Living things that form an ecosystem

Abiotic - Non-living things that form an ecosystem

Key Example:

Small scale UK Ecosystem - Epping forest

Tropical Rainforests

Key concepts and definitions:

Tropical rainforests - rainforests that occur in areas of tropical rainforest climate in which there is no dry season - all months have an average precipitation of at least 60 mm.

Interdependence - All parts of the rainforest (climate, water, soils, plants, animals and people) are dependent on one another. If any one of them changes, everything else is affected.

Biodiversity - The existence of a large number of different kinds of animals and plants which make a balanced environment. This includes species, genetic and ecological variation.

Deforestation - the removal of trees from forests.

Slash and burn - Slash and burn farming is a form of shifting agriculture where the natural vegetation is cut down and burned as a method of clearing the land for cultivation,

Selective logging - Selective logging or partial forest removal is the practice of cutting down a few species of trees while leaving the rest intact and unharmed.

Ecotourism - tourism directed towards exotic, often threatened, natural environments, intended to support conservation efforts and observe wildlife.

Key Case Study:

Causes and impacts of deforestation in the Malaysian rainforest. Malaysia had the world's highest rate of forest loss between 2000 and 2012.

Cold Environments

Key Concepts and definition:

Cold environments - Covering one quarter of the Earth's land surface, the world's cold environments are high-latitude world regions where cold, sinking air generates freezing winds and sunlight is thin. In many places the sun doesn't even rise for many months of the year and temperatures are consistently at or below zero degrees.

Tundra - Found south of the icecaps. The climate is less extreme. Temperatures may drop to -20 degrees. They lack permanent ice cover but still experience very cold weather most of the year

Permafrost - a thick subsurface layer of soil that remains below freezing point throughout the year, occurring chiefly in polar regions.

Wilderness - Areas of unspoilt, remote parts of the world, such as hot deserts, mountains and cold environments.

International agreements - formal understandings or commitments between two or more countries.

Conservation - Conservation's goals include protecting species from extinction, maintaining and restoring habitats, enhancing ecosystem services and protecting biological diversity.

Key Case Study:

Development opportunities (mineral extraction, tourism, energy, fishing) and challenges (extreme temperatures, inaccessibility, infrastructure) in Svalbard.

Physical Landscapes in the UK

Coastal Landscapes in the UK

Key concepts and definitions:

Weathering - the breakdown of rock in situ (where they are). Mechanical weathering is the breakdown of rock without changing its chemical composition. Chemical weathering is the breakdown of rock by changing its chemical composition such as carbonation weathering.

Erosion - when rocks are broken down and carried away by waves. Landforms created include headlands, bays, caves, arches, stacks, cliffs and wave cut platforms

Swash - water that washes up on the beach after an incoming wave has broken

Backwash - the water that runs back down the beach after a wave has broken

Mass movement - the downslope movement of rock, soil and mud under the influence of gravity.

Longshore drift - the movement of material along the shore by wave action.

Deposition - when waves slow down and lose energy, the water drops the sediment it has been carrying. Landforms created include beaches, spits, bars and sand dunes

Hard engineering - Using artificial structures such as sea walls to control natural processes

Soft engineering - Less intrusive, more environmentally friendly methods that work with the natural processes to protect the coast

Managed retreat - controlled retreat of the coastline. Often involving allowing the sea to flood over low-lying land

Key case study:

Swanage, Dorset - Example of a UK coastal landscape

Lyme Regis - Example of coastal management strategies

River Landscapes in the UK

Key concepts and definitions

River course - path of a river as it flows downhill. Rivers have a steep upper course, gently sloping middle course and a flat lower course

Erosion. Vertical erosion is the deepening of the river valley and channel. Lateral erosion is the widening of the river valley and channel.

Hydraulic action - the force of the river colliding with rocks breaks rock particles away from the river channel

Abrasion - eroded rocks picked up by the river and scrape against the channel, wearing it away

Attrition - eroded rocks picked up by the river crash into each other and break into smaller fragments.

Solution - river water dissolves some types of rocks

Traction - large particles are pushed along the riverbed by the force of the water

Saltation - pebble sized particles are bounced along the riverbed

Suspension - small particles carried along by the water

River erosion landforms - erosion of rivers creates waterfalls, meanders (large bends) and oxbow lakes

River deposition landforms - deposition by rivers creates levees and estuaries.

River management strategies - channel straightening, embankments, flood relief channels, floodplain zoning, river restoration.

Key case study:

River Tees - Example of a UK river landscape

Banbury - Managing river floods