8D Case Studies - CE Summer 2019

Thematic Studies

Candidates are required to study five themes: **Earthquakes and Volcanoes**, **Weather and Climate**, **Rivers and Coasts**, **Population and Settlement**, **Transport and Industry**. Candidates are expected to **study recent examples** (i.e. within their lifetimes), some of which **reflect variations in levels of global economic development**.

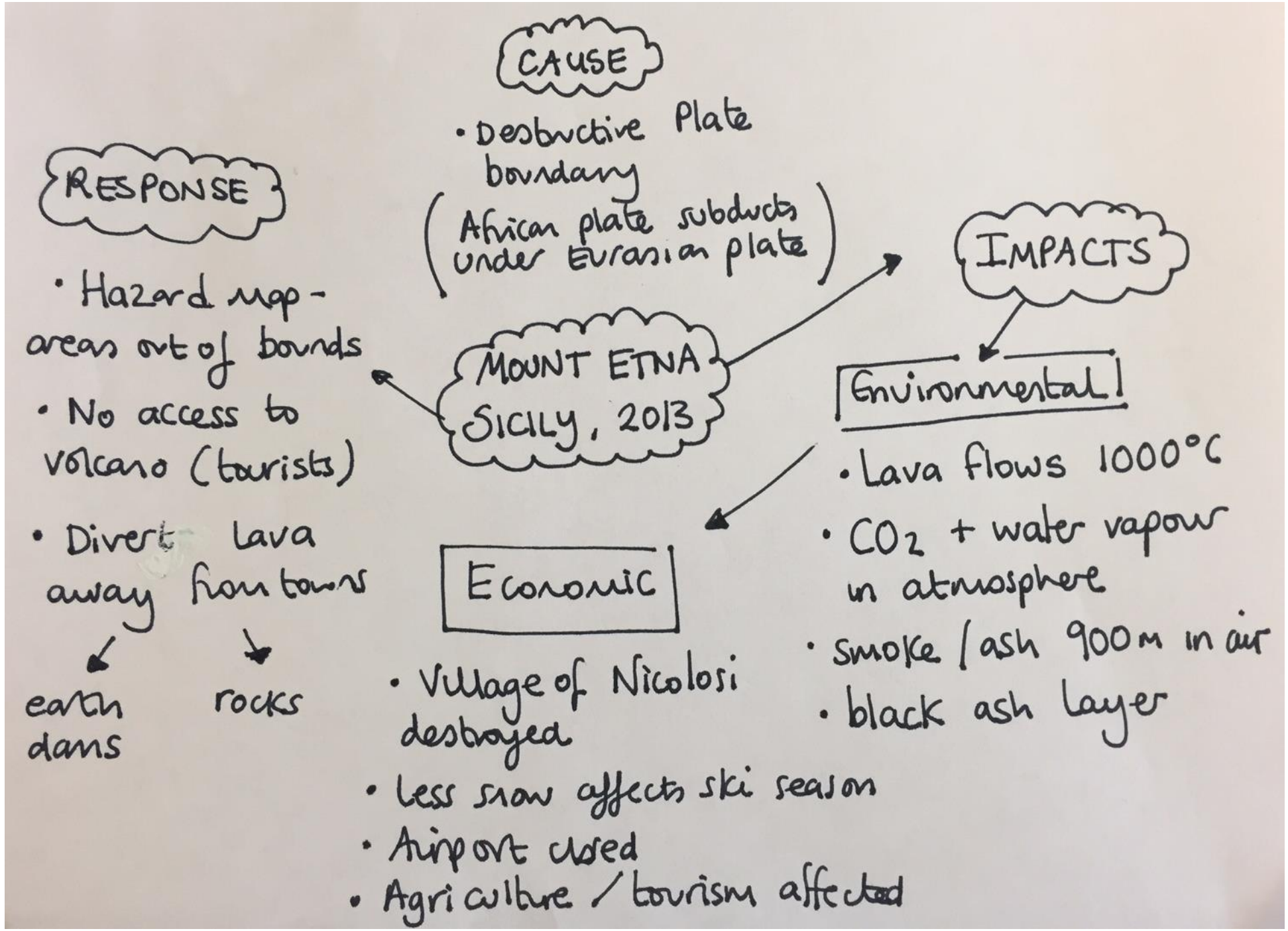
They must study examples of;

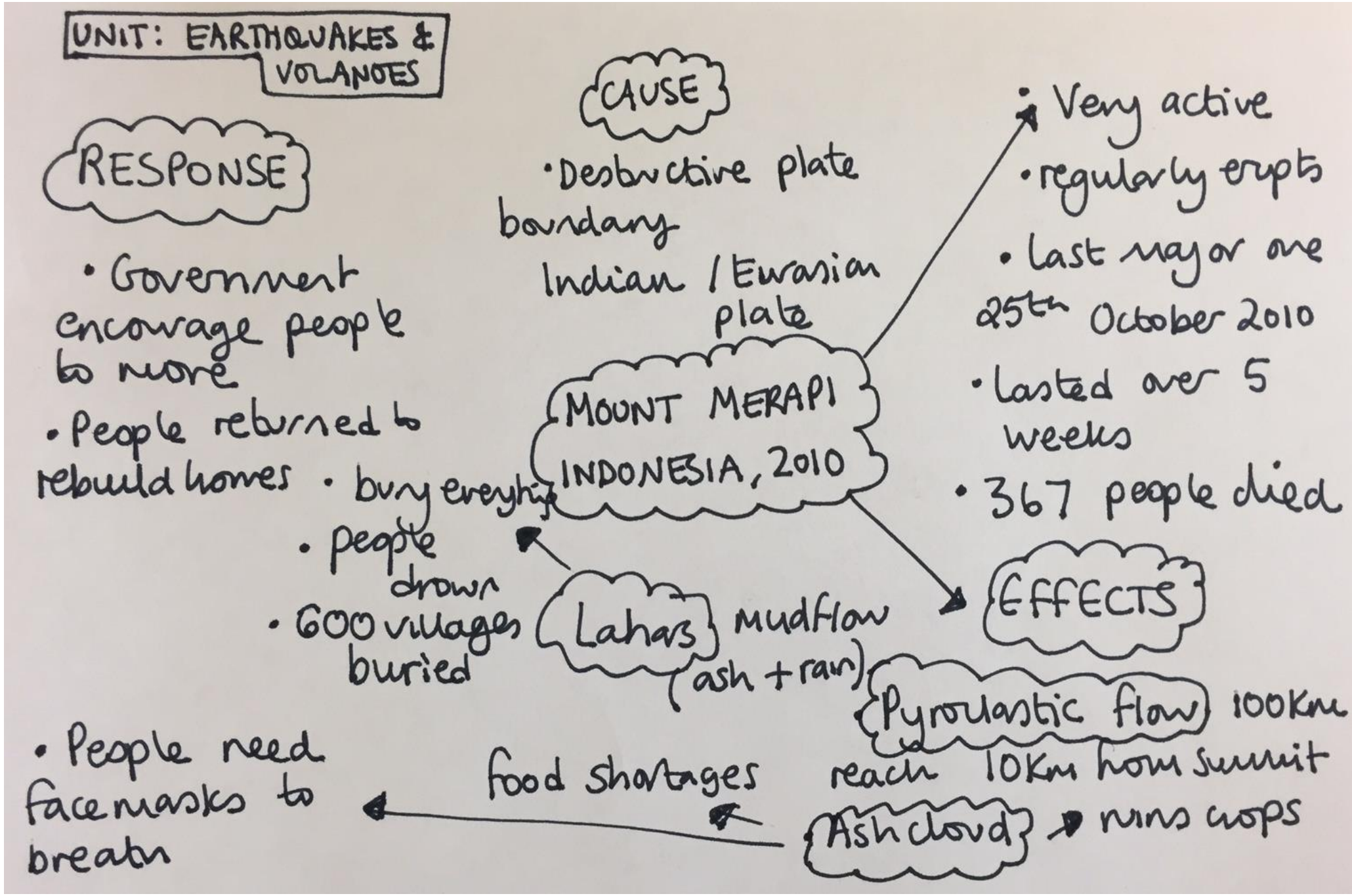
- *either* an **earthquake** *or* a **volcanic eruption**
- an **economic activity** both in a **developed** *and* a **developing** country
- detailed understanding of **a flood event** from anywhere in the world
- a **housing development** and a **transport project** (both either planned or completed), where **environmental issues** have been considered.

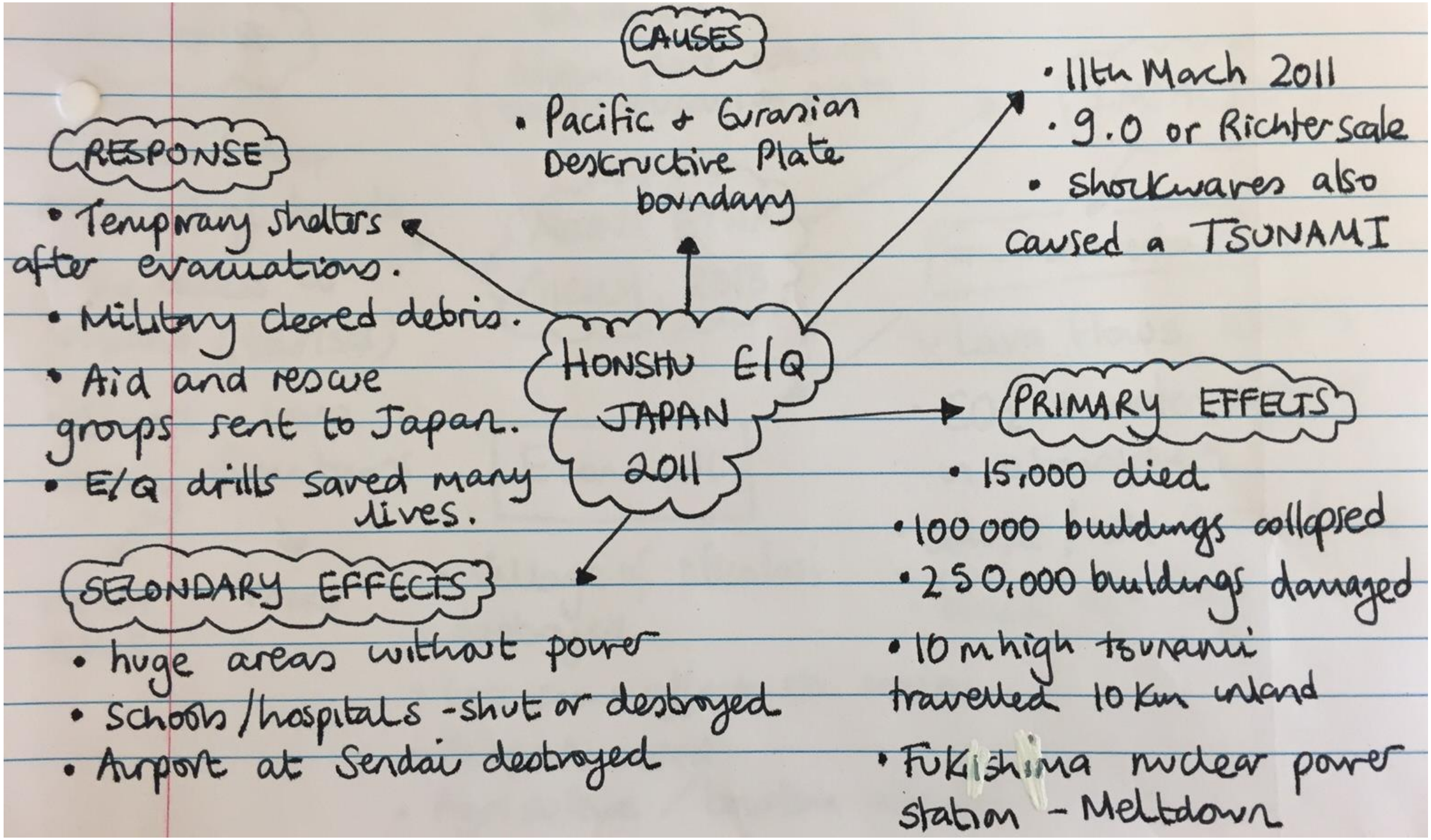
Theme	Sub-theme	Case Study Example
Tectonic Processes	Earthquake	• Haiti (LEDC) 2010 • L'Aquilla, Italy (MEDC) 2009
	Volcano	• Eyjafjallajokull, Iceland (MEDC) 2010 • Soufriere Hills, Montserrat (LEDC) 1995
Rivers and Coasts	Flood Event	• Cumbria 2009/2015
Transport and Industry	Economic Activity	• Lindores Abbey, Whisky distillery (Developed) • iPhone (Developing) • Nike (Kukdong Factory, Indonesia)
	Transport Project	• High Speed 2 (HS2)
Population and Settlement	Housing Development	• East Village, Queen Elizabeth Park, London

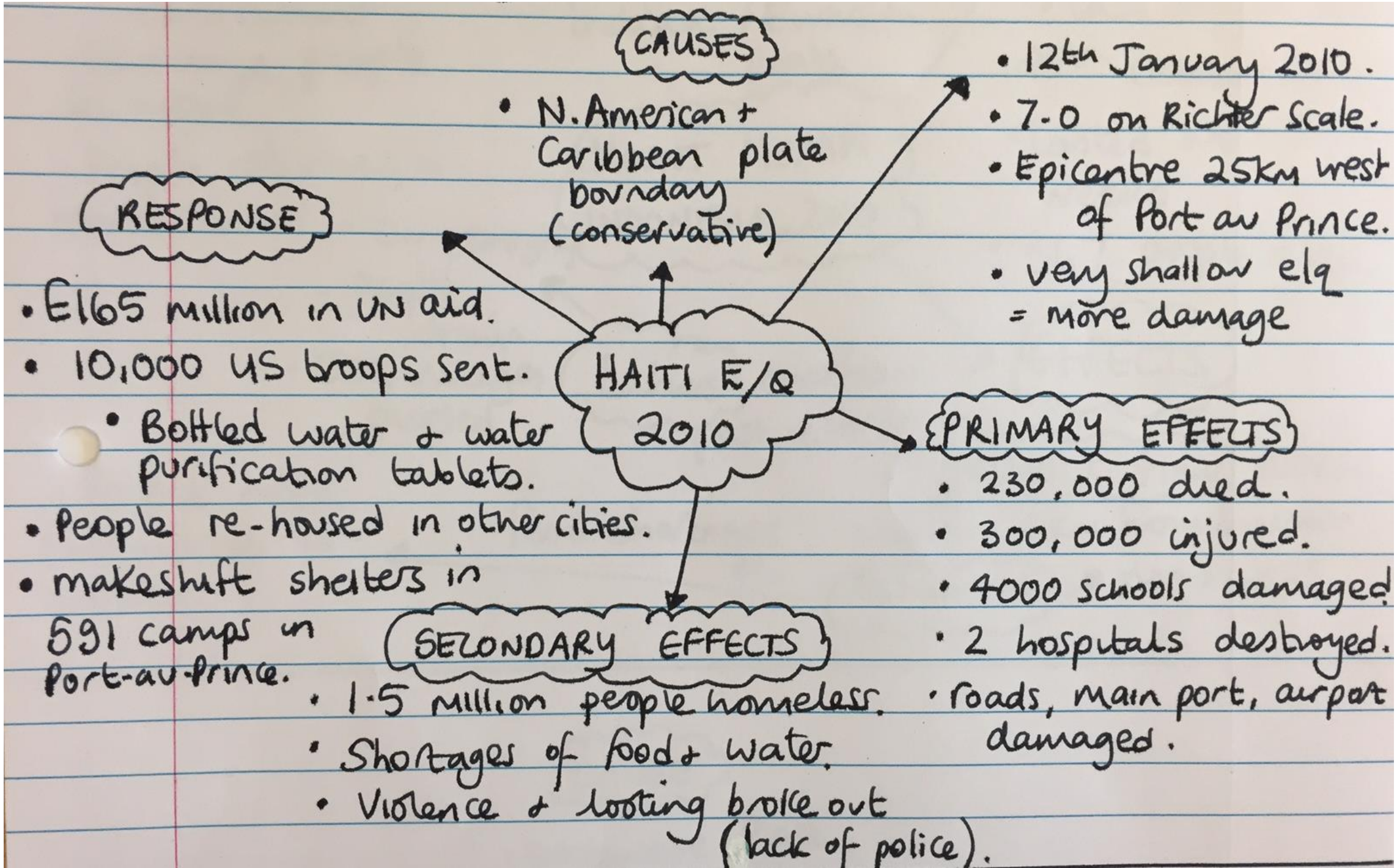
You may wish to use other case studies if you prefer. This list is merely a guide and differs from some of the case studies in this booklet. The ISEB for CE revision guide contains details of these, as well as other possible case studies.

Natural Hazards/Tectonic Processes Case Studies


CAUSE
• Destructive Plate boundary
(African plate subducts under Eurasian plate)
RESPONSE
• Hazard map - areas out of bounds
• No access to volcano (tourists)
• Divert lava away from towns
earth dams
rocks
MOUNT ETNA SICILY, 2013
IMPACTS
Environmental
• Lava flows 1000°C
• CO_2 + water vapour in atmosphere
• smoke / ash 900m in air
• black ash layer
Economic
• Village of Nicolosi destroyed
• less snow affects ski season
• Airport closed
• Agriculture / tourism affected


UNIT: EARTHQUAKES & VOLANOES
CAUSE
• Destructive plate boundary
Indian / Eurasian plate
RESPONSE
• Government encourage people to move
• People returned to rebuild homes
MOUNT MERAPI INDONESIA, 2010
• Very active
• regularly erupts
• last major one 25th October 2010
• lasted over 5 weeks
• 367 people died
• bury everything
• people drown
• 600 villages buried
Lahars Mudflow (ash + rain)
EFFECTS
Pyroclastic flow 100Km reach 10Km from summit
Ash cloud → ruins crops
food shortages
• People need facemasks to breath


HONSHU E/Q JAPAN 2011
CAUSES
• Pacific & Eurasian Destructive Plate boundary
• 11th March 2011
• 9.0 on Richter scale
• Shockwaves also caused a TSUNAMI
RESPONSE
• Temporary shelters after evacuations.
• Military cleared debris.
• Aid and rescue groups sent to Japan.
• E/Q drills saved many lives.
PRIMARY EFFECTS
• 15,000 died
• 100 000 buildings collapsed
• 250,000 buildings damaged
• 10 m high tsunami travelled 10 km inland
• Fukishima nuclear power station - Meltdown
SECONDARY EFFECTS
• huge areas without power
• Schools/hospitals - shut or destroyed
• Airport at Sendai destroyed


HAITI E/Q 2010
CAUSES
• N. American + Caribbean plate boundary (conservative)
• 12th January 2010.
• 7.0 on Richter Scale.
• Epicentre 25km west of Port au Prince.
• very shallow elq = more damage
RESPONSE
• £165 million in UN aid.
• 10,000 US troops sent.
• Bottled water & water purification tablets.
• People re-housed in other cities.
• makeshift shelters in 591 camps in Port-au-Prince.
PRIMARY EFFECTS
• 230,000 died.
• 300,000 injured.
• 4000 schools damaged
• 2 hospitals destroyed.
• roads, main port, airport damaged.
SECONDARY EFFECTS
• 1.5 million people homeless.
• Shortages of food & water.
• Violence & looting broke out (lack of police).

Response to Earthquakes in Developed (MEDC) and Developing (LEDC) countries.

SHORT TERM RESPONSES

Japan, Fukushima,

1) The Japanese government evacuated people into temporary shelters because they were at risk from fires, aftershocks and radiation released from the nuclear power station.
2) Fishing was banned in the sea nearby due to contamination.
3) Bulldozers were brought in to clear fallen buildings and roads to allow rescuers in.
4) Food and water was provided immediately for those affected.

In LEDC – Turkey, Izmit,

1) Government slow to act - stale bread sent out and army not mobilised straight away to help.
2) US Red Cross had to provide aid - packs of food and 'comfort kits'.
3) German Red Cross set up field hospitals to treat injured.
4) Burning Tupras oil refinery left to burn itself out rather than being tackled, so air and sea pollution worse.
5) People dug through the rubble with their bare hands

PLANNING AND PREPARATION n in MEDCs.

In MEDCs, preparing for earthquakes includes designing **earthquake proof buildings**, **retrofitting**, **building zoning**, **'Disaster Prevention Days'** and **Home Survival Kits**.
In the USA, FEMA (Federal Emergency Management Agency) gives information on how to prepare for earthquakes. It has a website with information about how to check your home for hazards, have **disaster supplies** on hand and to **identify a safe place** to evacuate to.

Building Zoning Maps – In California, by plotting seismic activity areas on maps, local government can stop any building in dangerous areas and insist on earthquake proofing measures being fitted to new or existing buildings.

Disaster Prevention Days - in Tokyo, Japan, each year there is a day when all businesses and school practise what to do in the event of an earthquake. Emergency services practise their procedures.

PREDICTION

Monitoring changes in the rocks below ground. This is done in California.

There are usually **minor tremors** before a major earthquake and these can be recorded by a series of seismometers.

Rocks moving below ground can **alter ground water levels**, which can be measured in wells.

Warnings can be given in advance if either of these changes occur. The problem is that they are not reliable and may only give a few minutes warning.

PLANNING IN LEDC's

Bamboo can be used to **construct homes** in LEDCs as it is strong but flexible. Steel would be too expensive. IIn Costa Rica all of the bamboo houses survived after a strong earthquake in 2009.

In India's Gujarat province, earthquake proof houses are made from **hollow bricks and steel foundations**. Hollow bricks are very light when they fall on you so cause less damage/injury.

OTHER INFO.: MEDC's v LEDC's

If people **plan and prepare** for earthquakes, the risks can be reduced.

The level of development of a country makes a difference**. MEDCs have more money for earthquake proofing and retrofitting**, whereas these may not be affordable in LEDCs. This is why earthquakes of a similar magnitude on the Richter Scale can be **more devastating in LEDCs.**

Rivers and Coasts Case Studies

Case Study: Cumbria Flooding 2009 & 2015

Causes

- Unexpected
- **3 months of rainfall fell in just over one day**
- **Storm Desmond (2015)**
- **Ground already saturated**
- **Steep slopes**
- **Climate Change**

Effects

- **1300 homes flooded**
- **Some loss of life**
- 4 feet high water at maximum flood level
- Dirty water all through Carlisle and other towns
- Businesses affected e.g. The Trout Hotel couldn't open for Christmas season
- **Bridges and roads closed.**
- People had to be evacuated from their homes

Response

- **Government provided £1 million for clean up and repairs**
- **Cumbria flood recovery fund set up**
- **Food supplies given**
- Villagers helped each other
- Salvage things from their homes
- **Cleared roads and footpaths**

Future Management

- **A £4.4 million management scheme**
- **New flood defence walls**
- River **dredged** more regularly **to deepen the channel**
- **New embankments to raise the height** of the river banks
- **New floodgates** at the back of some houses

Flood Management Strategies

Strategy	Advantages	Disadvantages	Strategy	Advantages	Disadvantages
Dams and reservoirs  The dam traps water, which builds up behind it, forming a reservoir. Water can be released in a controlled way.	• Can be used to produce electricity by passing the water through a turbine within the dam. • Reservoirs can attract tourists.	• Very expensive. • Dams trap sediment which means the reservoir can hold less water. • Habitats are flooded often leading to rotting vegetation. This releases methane which is a greenhouse gas. • Settlements are lost and people have to move.	**Flood warnings and preparation**  The environmental agency monitors rivers and issues warnings via newspapers, TV, radio and the internet when they are likely to flood so people can prepare.	• People have time to protect their properties, e.g. with sandbags. • Many possessions can be saved, resulting in fewer insurance claims.	• Some people may not be able to access the warnings. • Flash floods may happen too quickly for a warning to be effective. • They do not stop land from flooding - they just warn people that a flood is likely.
River straightening and dredging  Straightening the river speeds up the water so it moves quickly. Dredging makes the river deeper so it can hold more water.	• More water can be held in the channel. • It can be used to reduce flood risk in built-up areas.	• Dredging needs to be done frequently. • Speeding up the river increases flood risk downstream.	**Retention Ponds** 	• Attract wildlife • Looks natural	• Take up expensive building land
Embankments  Raising the banks of a river means that it can hold more water.	• Cheap with a one-off cost • Allows for flood water to be contained within the river.	• Looks unnatural. • Water speeds up and can increase flood risk downstream.	**Permeable Pavement** 	• Allows water to infiltrate • Attracts wildlife • Looks nice	• Harder to maintain than pavement

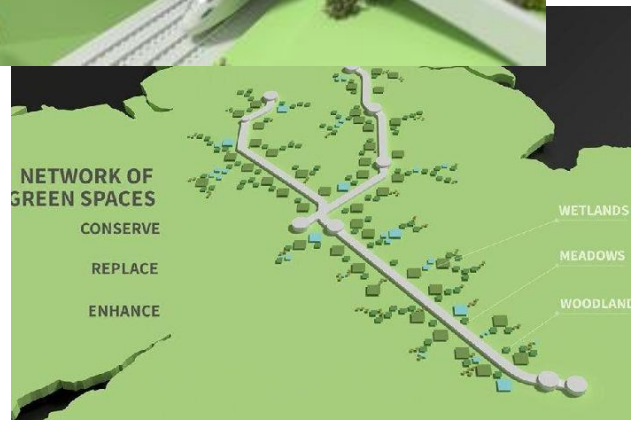
Transport and Industry Case Studies

HS2 – A Transport Project

(either planned or completed where **environmental issues** have been considered).

HS2 – A High speed train linking London to Birmingham (Phase 1), then to Manchester and Leeds (Phase 2).

Arguments For	Arguments Against
• Green, safe and efficient transport • 1 hr Birmingham to London • Boost business in Midlands and North • Creates jobs in construction	• Cost escalating • Environmental destruction (noise and visual pollution) • 83 hectares of woodland affected (habitats/wildlife destroyed) • Migration patterns of birds affected.



How have environmental issues been considered?

HS2's Green Corridor – replanting trees and relocation of wildlife

Along the Phase One route, which covers 216km from London to the West Midlands, the green corridor will encompass:

- **7 million new trees and shrubs**, including over 40 native species, specific to each location. The new native woodlands will cover over **9 square kilometres** of land.
- Over 33 square kilometres of new and existing wildlife
- Tailor-made **homes for wildlife**, ranging from bat houses to 226 new ponds for great crested newts and other amphibians.
- Earthworks and **landscaping** which will re-use around 90% of the material excavated during construction.
- The potential to support **community projects** and develop amenity spaces such as **access routes, public parks, open spaces** and **nature reserves**.

Nike

A **TNC** operating in both a developed and developing country

25,000 direct employees, 1 million others who make, sell or supply goods.

You need to know;
- **Reasons for choice of location**
- **Effects on local area**
- **Inputs, processes, Outputs**

TNC = Trans-National Company

Reasons for choice of location

Nike Headquarters – Oregon, USA (Quaternary)
- High level of technology and an educated workforce
- Good transport links

Nike Retail i.e. shops – mainly N. America and Europe (Tertiary)
- Mainly in developed countries where people have more money
- Developed countries more influenced by adverts

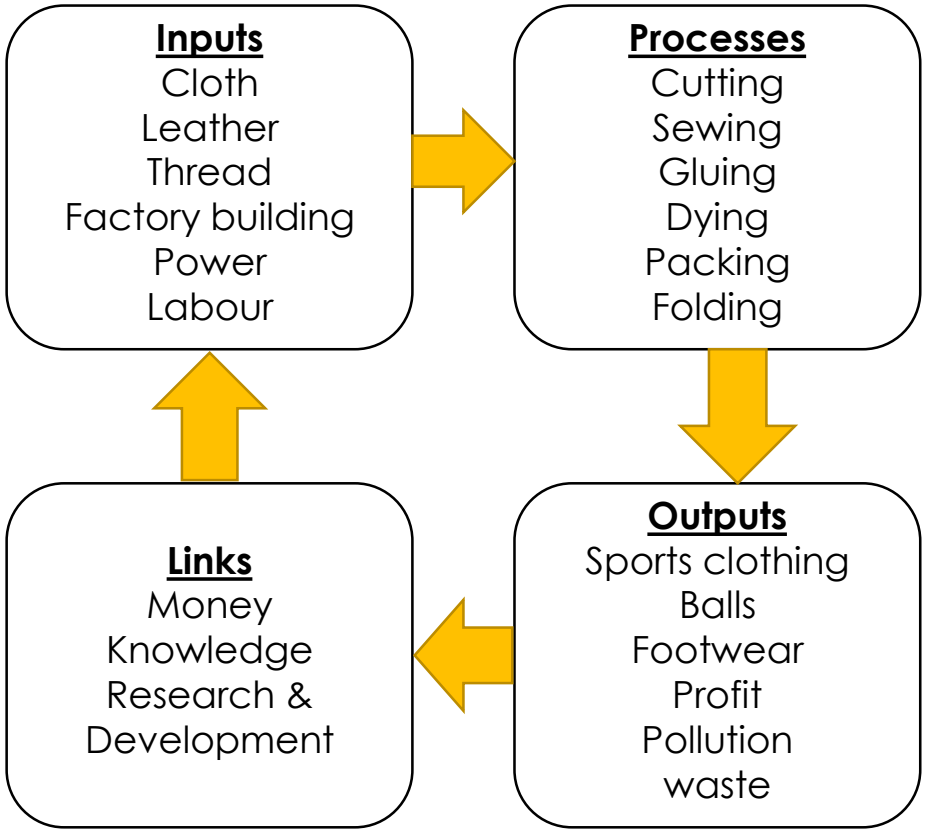
Nike Manufacturing – (Secondary)

Factories in over 40 countries all over the world e.g. **PJ Kukdong International Factory, Indonesia.**

Reasons it is located here;
- **Pay lower wages**
- **Flexible workforce**
- **Can transport good to European and N. American markets**
- **Trade restrictions avoided**

Benefits of locating in Indonesia	Problems of locating in Indonesia
• Jobs provided and skills for workers • Attracts other industries • Increases wealth in Indonesia • Increases exports and improves roads • Heathcare benefits for workers	• Environmental Pollution • Low pay • Encourages poor working conditions • Sweatshops develop

The factory system for PT Kukdong International Nike Factory, Indonesia



Population and Settlement Case Studies

Case Study: East Village, Queen Elizabeth Olympic Park

Stratford in the Lower Lea Valley lies to the north of the London Docklands. It had one of the most **deprived** communities in the country, where **unemployment** was high and levels of health were poor. There was a lack of **infrastructure** and the environmental quality was poor. The **2012 London Olympics** bid was partly successful on the basis of **sustainability**, with the understanding that Stratford would be used during the games and **regenerated for local people** to use after the competitors had left. After the Olympic Games were over, the park was renamed the Queen Elizabeth Olympic Park.

Social - By 2030, more than 10,000 new homes will have been built in the park. Five new neighborhoods, with lots of green spaces planned in, will be built and around a third of those houses will be affordable. A new academy has been built, which is used to educate around 2,000 pupils between the ages of 3 to 18.

Economic - Stratford is now a well-connected area of London, which allows **commuters** to travel to work easily. New jobs in construction and tourism have created a **multiplier effect**. It is estimated that over 20,000 jobs could be created by 2030, bringing more than £5 billion into the area.

Environmental - The park is sustainable in a number of ways, eg walking and cycling routes, the provision of public transport, the water-efficient design of homes and the protection of green spaces and natural **habitats**.

East Village, Queen Elizabeth Park – management of urban development

(either planned or completed **housing project** develop in an **environmentally sensitive** way).

2012 Olympic village **recycled** to create a new housing development called **East Village.**

Consists of:

- 2818 homes
- School and nursery
- 30 individual shops and cafes
- Health and well-being centre

How have they made this a sustainable development

- A focus on using **public transport** to **reduce CO2** emissions.
- **Insulation** in homes **saves using fossil fuels for heating.**
- **Natural light** is used – large windows in houses and use of LED lights to reduce CO2 emissions by 5000 tonnes per year.
- **Living green roofs** planted on all buildings higher than 100 to **absorb CO2**, **encourage wildlife** and **reduce noise.**
- Heat is generated from a **biomass power station.**
- The village has its own **water recycling project**. Water from gutters and roofs used for gardening. Grey water from showers and washing reused to flush loos.