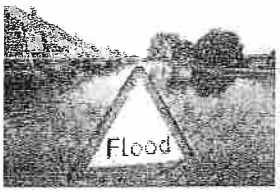
CASE STUDY CHECKLIST



CASE STUDY 1 - THE RIVER DERWENT, YORKSHIRE, 1999

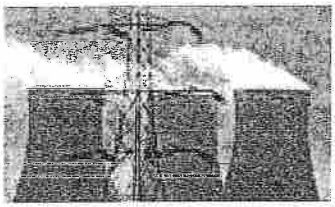
- to know the physical and human causes of flooding within the British Isles

CASE STUDY 2 - THE MISSISSIPPI RIVER, 2001

- to investigate a river outside the British Isles and evaluate the river management strategies used

CASE STUDY 3 - NEWCASTLE, CO DOWN

- evaluate the coastal management strategies used with reference to principles of sustainable development

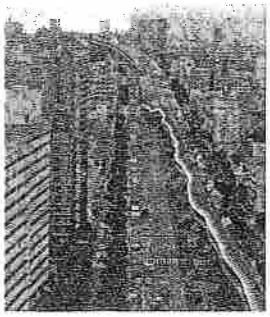


CASE STUDY 4 - UK CLIMATE CHANGE

- to know the actual and potential effects of climate change on the environment, society and economy
- to evaluate the effects on the UK

CASE STUDY 5 - MARKET RASEN, LINCOLNSHIRE, 2008

- to describe and explain the causes of the quake
- describe and explain the impact of the quake



CASE STUDY 6 - MEDC -THE KOBE EARTHQUAKE IN JAPAN, 1995

-to know the causes of the earthquake

- to know the short and long term impacts on people and the environment

- to know the management responses (prediction and precautions before/ immediate and long term after)

- to evaluate the management response

CASE STUDY 7 - LEDC - THE INDIAN OCEAN EARTHQUAKE, 2004

- to know the causes of the earthquake

- to know the short and long term impacts on people and the environment

- to know the management responses (prediction and precautions before/ immediate and long term after)

- to evaluate the management response

CASE STUDY 1 – THE RIVER DERWENT, YORKSHIRE, 1999

- *to know the physical and human causes of flooding within the British Isles*

BACKGROUND:

➢ River Derwent flooded in March 1999. Worst flood in 70 years

PHYSICAL CAUSES

♣ HEAVY RAINFALL – 250mm fell in 2 weeks on North York Moors, fed by 3 tributaries = higher discharge

♣ LACK OF INFILTRATION – ground was already saturated, more surface runoff

♣ TIME OF YEAR- snow melt added to discharge from Moors

HUMAN CAUSES

× PEAT REMOVAL – peat acts like sponge and soaks water, when it was removed, created more surface runoff

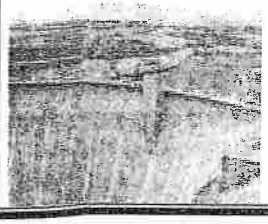
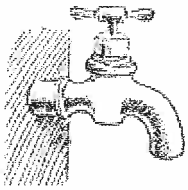
× NEW BUILDING – new housing estate built in Malton, more impermeable surfaces, less infiltration and more surface runoff

CASE STUDY 2 – THE MISSISSIPPI RIVER, 2001

- *to investigate a river outside the British Isles and evaluate the river management strategies used*

BACKGROUND

- Drains 1/3 USA and part of Canada. Floods in 2001 cost $13million

HARD ENGINEERING STRATEGY	PROS	CONS
Raised levees 	-prevent flood damage to people, property and businesses	-River still floods -heightened levees (15m)., Silt deposits raised river bed and New Orleans 4.3m below water level= made flooding worse
Straightening the river channel	-improved trade and GNP as ships can get round meanders 	- makes flooding worse downstream where river not protected as velocity faster = more erosion
Dams 	-100 dams control water supply for 18 million people 	- ugly -lack of silt on land means less fertile, needs expensive fertilisers

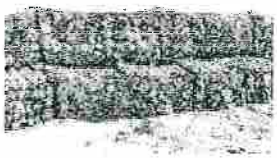
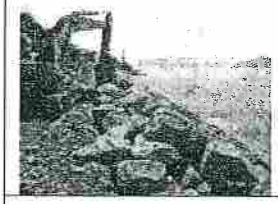
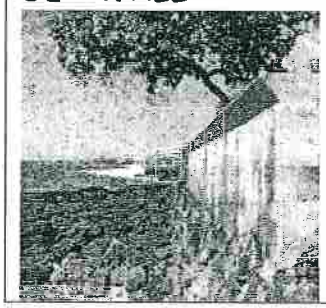
SOFT ENGINEERING	ADVANTAGES	DISADVANTAGES
Afforestation in the upper course 	-infiltrates precipitation - prevents soil erosion as roots hold soil together	-costly 
Safe flood zones 	-stop building on floodplain eg Rock Island houses were demolished	-limits amount of land for people to live

CASE STUDY 3-NEWCASTLE, CO DOWN

- evaluate the sustainability of coastal management strategies

BACKGROUND

- tourism means Newcastle has to be managed.
- More has been hard management

MANAGEMENT TYPE	ADVANTAGES	DISADVANTAGES
GROYNES 	- built in 1980s to trap sand	- groynes now decayed and don't work -make sand loss worse - new set would cost £1250 per m
GABIONS 	- protect the recreation ground at the mouth of the River Shimna - more sustainable than rock armour was water enters cage and loses energy instead of bouncing back	- first set of gabions were rotten and replaced in 2006
ROCK ARMOUR 	- stops the erosion of sand dunes - more attractive than seas walls	- rock armour to protect Royal County Down golf course, is unsustainable as stopped sand arriving at Murlough Bay
SEA WALL 	-protects houses and industry -the promenade protects the town	-storm of 2002 meant sea wall and promenade was rebuilt - very expensive (£4million) - new wall means waves bounce back and increases beach erosion - beach is losing sand

CONCLUSIONS

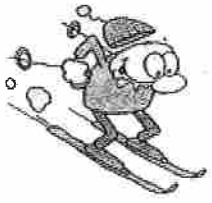
- every type of management has caused problems
- the coastline is no longer natural
- The Coastal Zone Management Strategy is working towards making it sustainable
- The Council is now considering new groynes and beach nourishment to meet tourism demand

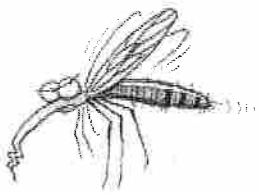
CASE STUDY 4 – UK CLIMATE CHANGE

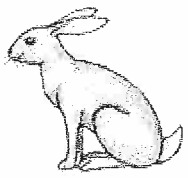
- *to know the actual and potential effects of climate change on the environment, society and economy*
- *to evaluate the effects on the UK*

	POSITIVE	NEGATIVE
EFFECTS OF **ENVIRONMENT**	Trees grow further north 	Rising sea levels could flood salt marshes, killing wildlife Plants and animals living high in mountains eg hares could be extinct
EFFECTS ON **SOCIETY/PEOPLE**	More people holiday at home 	Southern Britain is drier with water shortages. Society might adapt with hose-pipe bans Increases in pests and diseases eg mites attack crops. Tropical diseases like malaria spread to the UK
EFFECTS ON **ECONOMY**	Higher yields of oats, barley and wheat in Scotland Vines grow in northern England 	Low-lying areas could flood eg the Fens. Defences need to be strengthened. Could destroy farmland Rising temperatures in Scotland cause the skiing industry to disappear

EVALUATE – more negative than positive impacts





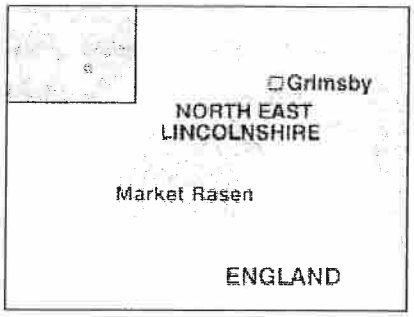


CASE STUDY 5 – MARKET RASEN, LINCOLNSHIRE, 2008

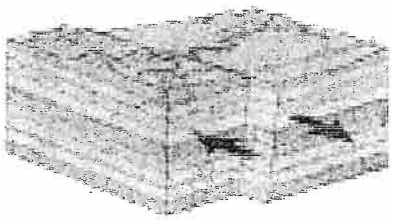
- to describe and explain the causes of the quake
- describe and explain the impact of the quake

BACKGROUND

- Quake measured 5.2 on Richter scale. Lasted 10 seconds
- UK's largest in 25 years
- Happened in February 2008



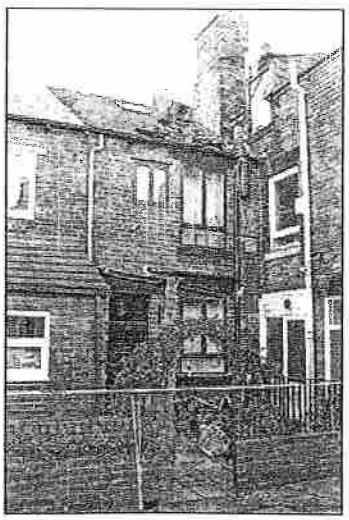
CAUSES OF QUAKE

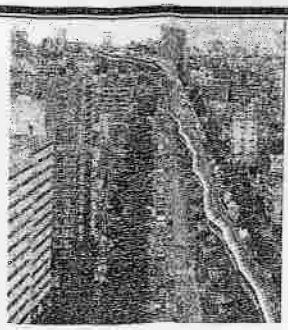


- UK lies in the middle of the Eurasian plate near a strike slip fault
- An 'intraplate' earthquake as there was a sudden release of stress and tension builds up as plates slide past and release with a jerk causing quake

IMPACTS

-South Yorkshire – man has broken bones when chimney collapsed
- Bangor, NI- people woke from their sleep
-There was one fire as a result of the quake
-load noise, like an 'underground train'
- caused over £10 million of damage
- David Bates had a broken pelvis when the ceiling fell in his attic bedroom
- Roads closed as repair work took place
- Church's stone cross fell on roof causing £10,000 damage





CASE STUDY 6 - MEDC -THE KOBE EARTHQUAKE IN JAPAN, 1995

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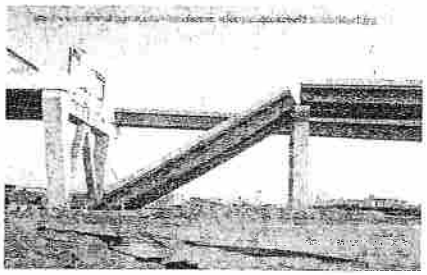
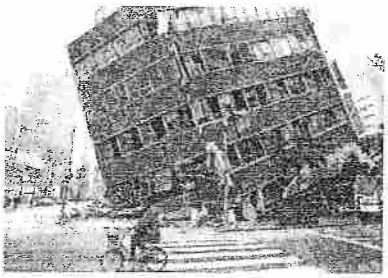


BACKGROUND

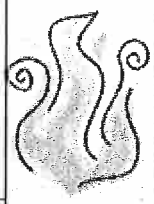
-17 January 1995 at 5.46am.
-measured 7.2 on Richter scale
-Epicentre was 20km south-west of central Kobe

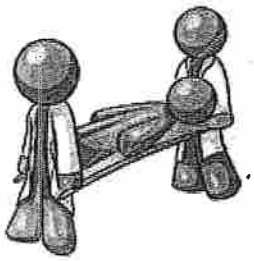


CAUSES

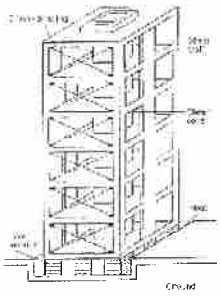
- Destructive plate margin where 3 plates meet
- Philippine plate (oceanic) subducted under Eurasian (continental) plate
- Pressure builds up and releases with a jerk = quake

	Impact on PEOPLE	Impact on ENVIRONMENT
SHORT TERM	-200,000 **BUILDINGS** collapsed. Many built before WW2 and concrete roofs fell in, causing deaths -**TRANSPORT** disrupted eg Hanshin Expressway, bullet train track snapped, roads blocked delaying ambulances and fire engines	-**LIQUEFACTION** (underground water came to surface) turning ground to mud. Panasonic closed. 90% of port's berths were destroyed -150 **FIRES** as gas pipes burst. Created smog which covered the Rokko Mountains
LONG TERM	-**5500 DIED** as buildings, roads and bridges collapsed. But more in fires -in January 1999 people still living in temporary accommodation	-**LAND MOVED** 1.2-1.5m right on Awaji island. A landslide changed the shape of the fields

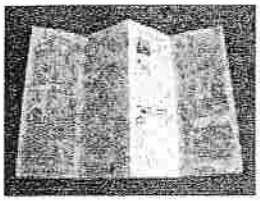




BEFORE THE QUAKE - PREDICTION AND PRECAUTION

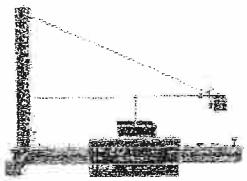


✓ EARTHQUAKE PROOF BUILDINGS - cross beams spread shockwaves evenly, reinforced concrete, springs and computers to make buildings sway



✓ PUBLIC EDUCATION PROGRAMME- pamphlets (get under tables, quake kits etc) broadcasts and lectures in quake survival. Every 1st September there is a public holiday to practice quake drills

IMMEDIATE AND LONG TERM ACTION



❖ Increased number of instruments to record and measure Earth movement

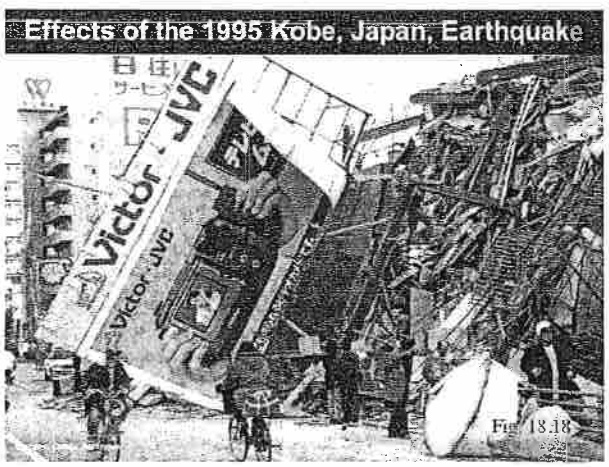
❖ 1990s stricter building control- (fire resistant materials, flexible steel frames + built on solid rock)

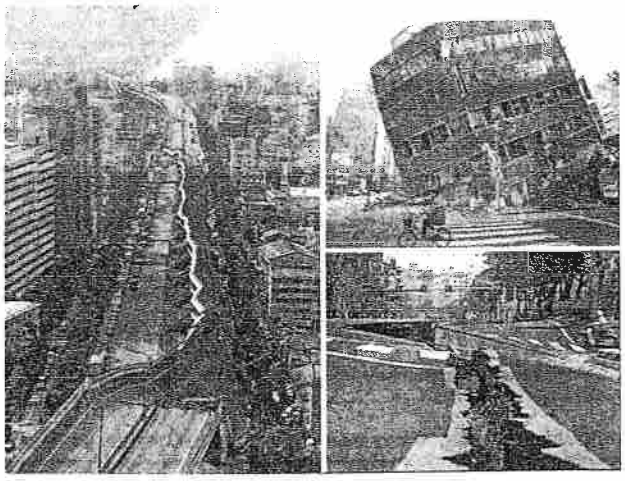
HOW SUCCESSFUL WAS THE RESPONSE??

✓ Emergency drills, trained emergency services, monitoring equipment, some reinforced roads and buildings, everyone educated about quakes

× Fires spread though old wooden houses, older houses had concrete roofs which collapsed, roads collapsed and fire engines/ambulances couldn't reach areas, many died due to time of day which is not controllable.

QUAKES CANNOT BE PREVENTED OR PREDICTED- YOU CAN ONLY TRY TO MINIMISE DAMAGE (IF YOU ARE RICH!!)





CASE STUDY 7 - LEDC - THE INDIAN OCEAN EARTHQUAKE, 2004

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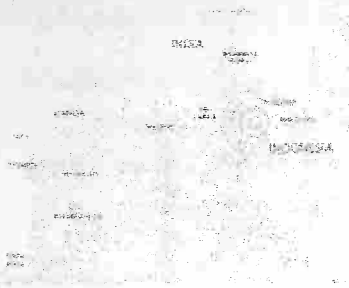


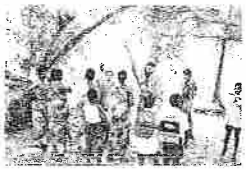
BACKGROUND

- Happened 26 December 2004.
- Magnitude 9.2, off west coast of Sumatra, Indonesia (2nd largest recorded and longest recorded (10 seconds)

CAUSES

- There is a fault line where the Australian plate meets the Sunda plate (the Sunda trench).
- This is a subduction zone – a 15m slip caused the long earthquake
- Ocean floor also rose causing tsunami

	Impact on PEOPLE	Impact on ENVIRONMENT
SHORT TERM	66% of Sri Lankan fishing boats destroyed- terrible as 250,000 people rely on it 	30m high wave affected as far away as Somalia in West Africa  Aftershocks continued for 3-4 months Earth vibrated by 1cm

	125,000 people injured 1.1 million people moved	
LONG TERM 	187,000 people died (1/3 kids) Mental trauma as they Islamic believe they must bury dead - many bodies never found 17 Maldives' islands uninhabitable for decades as freshwater contaminated by saltwater	Global sea level rose by 0.1mm Mangrove and coral reefs damaged Energy released shortened the day by 2.68 seconds

BEFORE THE QUAKE: PREDICTION AND PRECAUTIONS

- ✓ No early warning system in the Indian Ocean
- ✓ In Phuket in Thailand a young geography student recognised the signs and warned people to evacuate. Early warning signs - sea retreats, sea may bubble.
- ✓ One island (Simeulue) felt the tremor and people evacuated to the hills

IMMEDIATE AND LONG TERM ACTION

- ❖ $7 billion of aid
- ❖ 25 new seismic stations set up
- ❖ Sri Lanka, Maldives and Indonesia set up laws to keep order and help give out aid
- ❖ Building houses which are more resistant to tsunami flooding