CASE STUDIES SUMMARIES

1. Earthquake Hazard Example: Armenian earthquake in 1988

- Measured 6.9 on the Richter scale
- Caused by Arabian and Eurasion tectionic plates
- Depth of the quake was 5 km under surface
- 25 000 people killed
- 300 000 people injured
- Most buildings did not withstand the quake – hence many deaths caused by collapsing buildings
- ~ 200 strong aftershocks lead to even more severe effects
- Very vulnerable.
- Buildings constructed with weak materials
- No money for technology
- Poor education – people did not know what to do
- Chaos – nobody knew how many people are missing / where they are
- Rescue teams could not get anywhere – all roads blocked

2. Hazards in Attiki, Greece

1999 Attiki Earthquake

- Magnitude of 6.0 Richter
- Occurred on September 7, 1999, at 2:56:50 pm local time and lasted approximately 15 seconds in Ano Liosia.
- The tremor was epicentered approximately 17 km to the northwest of the city center, in a sparsely populated area near Mount Parnitha National Park.
- This proximity to the Athens Metropolitan Area resulted in widespread structural damage,
- 143 dead
  2,000 injured
  50,000 homeless
  53,000+ buildings damaged or destroyed
- Northern Athenian suburbs of Kifissia, Metamorfosi, Kamatero and Nea Philadelphia worst affected.
- More than 100 buildings (including three major factories) across those areas collapsed trapping scores of victims under their rubble while dozens more were severely damaged.

1987 Heatwaves/droughts

- Summer of 1987 saw temperatures as high as 44 degrees C and low wind speeds
- 1000 people died in Athens – more than double the usual for this period
- Smog also accompanied the heat wave so made the stress greater for the people
- Elderly and retired people were particularly susceptible
- 2960 people were administered to 68 Athens hospitals at this period
- The deaths were from heat stroke, heat exhaustion etc

2007 wildfires

- 28 June 2007- 3 September 2007 over 3000 firest recorded across Greece
- A series of massive forest fires that broke out in several areas.
- In total 84 people lost their lives because of the fires, including several fire fighters.
- Significant parts of the Parnitha National Park were destroyed and in total, the fire burnt area of 153.8 km^2.

1994 Greek floods

- Flooding constituted the second most frequent natural disaster in Greece during 1928–2005 (15 episodes; 23.4% of total) after earthquakes.
- It led to 78 deaths, 10,990 affected people and 719,518,000 US$ damage and repair costs (World Health Organisation 2005).

4.Multiple Hazard Hotspot: The Philippines

Natural Hazards

- 7000 islands at latitudes 5–20°N of the equator. Islands difficult to reach / warn
- Within a belt of tropical cyclone storms (typhoons). Approx 6-7 major storms per year.
- 1976 tsunami
- The dense oceanic Philippines plate is being subducted beneath Eurasian plate at a destructive plate margin
- June 1991 Volcanic eruption of Pinatubo, killed between 250-800 but many evacuated as US air base in area gave warnings and provided vehicles. Typhoon Yunya hit at same time.
- Tropical monsoon climate, subject to heavy rainfall which can lead to flooding and subsequent land sliding / mass movement made possible because of deforestation of many hillsides: Feb 2006 1,126 were killed by landslide
- Drought: April 1998 2.5 million affected severely

Vulnerability

- Lower middle income country: lower capacity to cope though has successes too. GDP $3300 PPP
- With a rapidly increasing young population.
- Also urbanizing at an even greater rate, average densities for the whole country are high at 240km², up to 2,000 per km² in the megacity of Manila (population 20m, growing 250 000 per year). Much of Manila at sea level.
- People are very poor and live coastally - making them very vulnerable to locally generated tsunamis and typhoon generated storm surges.
- The Philippines therefore experiences social and economic vulnerability & high risk

5.Multiple Hazard Hotspot: California

- Approx. 40 million people.
- Megacity of Los Angeles, millionaire cities of San Diego, San Francisco. SANSAN corridor
- **Geophysical hazards**: the San Andreas fault (part of a broader fault zone) marks a conservative plate boundary where two coastal plates slide past each other, parallel to the plate margin at differential speeds. An earthquake of Richter Scale 7 or above would have massive impacts. The soft basin sediments in LA lead to rapid shaking with 5 major earthquakes being recorded in the last 100 years. Earthquakes when shallow are more destructive.
- **Loma Prieta earthquake in San Francisco, 17 October 1989**
- Magnitude 7.1
- 63 dead
- $6 Billion damages
- 1018 homes destroyed
- Northridge earthquake in Los Angeles
- 17th January 1994
- Magnitude 6.7
- 57 dead
- 12 599 buildings damaged
- 9000 homes and businesses without water for several days

Range of **atmospheric hazards** - fog, drought and associated frequent wildfires.

- **El Niño — La Niña oscillation**: winter storms, especially during El Nino years lead to floods in the Los Angeles and San Gabriel rivers (with deforested hill sides).
- El Nino is part of a cycle of approximately 7 years, in which 1-2 years occur as El Nino years and 1-2 occur as La Nina.
- El Nino is defined as an abnormal warning of surface ocean waters in the Eastern Pacific
- El Nino years, air currents move eastwards across the Pacific, brining moist air to South America and the eastern Pacific. The California coast is also affected by this current, bringing torrential rain – **causing floods and landslides.**
- In La Nina Years involve current reversing to move across the Pacific towards Australia, bringing moist air. Warm dry air blows over California from the American deserts, bringing drought and the threat of **forest fires** to California.
- **Summer drought** problem in a Mediterranean climate, especially in Southern California, but more marked in La Niña years.

- **Advection fog** occur when cool air from cold offshore current drifts inland and meets warm air (especially in Summer). Climate conditions combine with car pollution to generate photochemical smog which collects in the basin.
- **Landslides** take place in heavy winter storms where hillsides have been burnt by wildfire and eroded.
- Risk of erosion along coast near Malibu and Santa Monica (related to ENSO cycle).
- Only sophisticated management prevents California from becoming a disaster zone (measured in mortality). NB prediction of earthquake activity is not possible even with technology. GDP $47 000 PPP

- 60% of British are working and have to pay taxes.
- These taxes must pay the pensions to the 21% of the population that are retired
- Dependency looking worse in the future with 56% of the population in 2030 working paying 26% of people who will have retired
- There is a big difference between retired people – people in their 60s are very different and active compared to those in their 80s

Positives
- Voluntary charitable work eg retired people often run second hand shops in UK
- Spending money on goods and services eg golf and cruises – grey consumers
- Bringing wisdom and experience to some sectors – eg many people work as consultants into their 70s or 80s
- Elderly homeowners can borrow money from the banks and the bank then reclaims this money on their death from the money from the sale of the house – called equity release
- Many own stocks and shares so make new profits and pay taxes on these

Negatives
- Economic costs – providing health care, retirement homes and a pension(to those over 65) is going to become increasingly expensive (Baby boomers will cost £30 billion a year by 2026)
- Housing costs are paid by the government for those who have no savings
- Government gives free TV license to those over 75 and 200 pounds of free winter fuel too
- Train and bus passes may be issued free - expensive
- Housing shortages due to longer life expectancy eg at the coast in Bournemouth
- House prices have trebled from 1995-2005 in some UK seaside towns so young people who are first time buyers get pushed out of the market
- Emotional burden on younger and middle aged people to take care of older relatives
- More degenerative illnesses to deal with eg Alzheimers