Case studies all in one

Here I have put all the case studies figures into one document because over the two separate notes that I've made for human and physical factors on tectonic hazard I used the same case studies but using different figures. In the exam you can use the same case study more than once as long as you don't repeat yourself that is why I kept two different documents for human and physical factors it made it sort of easier for me but so of you might want to look at the whole thing and memorise it that way.

Kashmir 2005 earthquake – Population of 11.25 million

- Magnitude of 7.6
- 8th Saturday October, 2005 at 8:50am
- Occurred on a destructive plate margin Eurasian and Indian Plates
- No local disaster planning
- Poor infrastructure not earthquake resistant
- Poor communication, few roads some badly constructed
- 100,000 deaths, mostly from collapsed buildings
- 3 million people homeless
- Water pipes, electricity lines broken and cutting off supply
- 87,350 people died, 19,000 of which children
- 138,000 were injured
- Epicentre located 19km north northeast of the city of Muzaffarabad (Capital of Pakistani)
- 500,000 people affected
- 250,000 farm animals died due to collapsed of stone barns
- 780,000 buildings were either destroyed or damaged beyond repair, out of these 17,000 schools buildings and major hospitals close to the epicentre were destroyed

Northwest Turkey, Izmit 1999– Population of 2.8 million

- Magnitude of 7.6
- On Convergent plate boundary caused by Anatolian plate and the Eurasian plates moving past each other.
- No local disaster planning
- Poor infrastructure, Builders and contractors who build houses took short cuts to save money and time
- 60 – 70% of building near the plate boundary collapsed
- 30,000 deaths, mostly from collapsed buildings
- 600,000 people made homeless
- Water pipes, electricity lines broken and cutting off supply for 12 days

Kobe 1995 earthquake – Population of 1.4 million

- More than 5000 died in the quake
- HDI 0.953
- GDP per capita $22475.48
- 300,000 were made home less
- More than 102,000 buildings were destroyed in Kobe, especially the older wooden buildings.
- Estimated cost to rebuild the basics = £100 billion.
- The worst affected area was the centre. This was because it was built on easily moving ground which LIQUIFIED, allowing building to collapse and sink.

Haiti 2010 earthquake – Population of 9.7 million

- GDP per capita $343.89
- HDI 0.456
- More than half of Haiti's population – between 5 and 6 million people – live in rural areas. About 85% of the rural population practise some agriculture which accounts for about 26% of Haiti's economic
- output and makes agriculture
- 3,500,000 people were affected by the quake
- 220,000 people estimated to have died
- 300,000+ people were injured
- Over 188,383 houses were badly damaged and 105,000 were destroyed by the earthquake (293,383 in total)
- 1.5m people became homeless
- 4,000 schools were damaged or destroyed
- 25% of civil servants in Port au Prince died
- Over 600,000 people left their home area in Port-au-Prince and mostly stayed with host families

Sichuan 2008 earthquake – Population of 87.26 million

- GDP per capita $2,545
- HDI 0.777
- Magnitude of 7
- 15 million people affected by the quake
- 87,150 people killed
- 374,000+ people were injured
- A total of 5 million buildings collapsed
- 4.8 million people became homeless
- Most of the areas affected by the earthquake are fertile farming lands
- 78% of the families engaged in both agricultural and livestock farming. The main crops are rice, wheat, rapeseed and corn

Nyrangango 2002 volcano - Population of 1 million

- An estimated 80,000 people – about 16,000 households – became homeless
- VEI of 1
- 147 people killed, 45 of which in the first 24 hours of the eruption killed by roofs crashing down due to the heavy ash, lava flows, and toxic gas
- 14 villages were destroyed
- Goma split in half by lava flows. 4500 buildings destroyed 40% of Goma
- Very large number lost their workplace, their employment and their income, as well as assets and savings (increase vulnerability no income)

Eyjafjallajokull 2010 volcano - Population of 300,000

- VEI of 4
- No death
- 500 farmers and their families had to be evacuated from the area around the volcano and many of the roads surrounding the volcano were shut down.
- Between March the 3rd and 5th of 2010 there were plenty of warning signs of an eruption
- The local population was evacuated for safety and because of respiratory threats due to the ash.
- Fresh fish exports, a major local industry, were badly affected with loss of income
- Flood (ajökulhlaups - glacier outburst flood) on the 14th of April, when an eruption partly melted a glacier and set off a major flood which prompted authorities to order 700 people to evacuate.

Christ Church 2011 earthquake - Population of 376,700

- Time and Date, 22nd February 2011 – 12-51pm
- Magnitude of 7.1
- GDP per capita $27,700
- Adult literacy rate 99% over 15 years can read/write
- 100% people have access to clean water
- Liquefaction caused as a result of ground shaken, everything from buildings to roads to cars and trees sunk into the ground, Sand boils most common type of liquefaction.
- 181 people were killed, 80 of which from Christchurch TV building collapsed
- 2,000 people were injured
- 1 in 5 people lost their jobs because many buildings were destroyed. 6,000 companies and institutions with over 50,000 employees in the CBD of 45% of them are likely to retain their jobs in another location.
- $40billion worth of damage need to repair infrastructure

Nepal 2015 earthquake - Population of 29 million

- Time and Date 25th April 2015 11:56am
- Magnitude of 8
- GDP per capita $2,260
- Adult literacy 57.4% over 15 years can read/write
- 87.6% people have access to clean water
- 6,204 people died
- 14,000 and over been injured across the country
- 18 climbers died at Mount Everest base due to aftershock of quake causing an avalanche
- 75 people killed in India
- 8 million people total affected figure by the UN
- 3.5million people need of food assistance figure by UN
- 130,033 houses total destroyed

Mont Pinatubo 1991 volcano – Population of villages on its slops were 30,000 overall population around the region 1 million

- VEI of 6
- No monitoring tell 3rd April, but seismometers put into place
- Philippine Institute of Volcanology and Seismology (PHIVOLCS) and the United States Geological Survey (USGS) were able to accurately predict the timing of the eruption and its effects. As a result, the Philippine government and the American military were able to carry out a timely evacuation of the population, saving thousands of lives and millions of dollars in property damage.
- 847 people killed, 300 of which from collapsing roofs , 100 from mud flows as lahars
- $700million damages
- 75,000 people evacuated due to accurate predictions
- Dams were built to control destructive lahars that followed the eruption, and recovery costs totalled billions of Philippine pesos.
- The USGS and PHIVOLCS estimate that their forecasts saved at least 5,000 lives and perhaps as many as 20,000. The people living in the lowlands around Mount Pinatubo were alerted to the impending eruption by the forecasts, and many fled to towns at safer dis trances from the volcano or took shelter in buildings with strong roofs.
- Before the 1991 eruption it has not been erupted for 500 years.

Hawaiian Kilauea volcano - Population of 2,800

- There have been 34 eruptions since 1952, and 61 eruptions total
- VEI of 1
- Current eruption was in 1983
- No deaths but a lot of environmental damage to the area
- Gentle lava flows - now in its eighteenth year of continuous eruption

Mount St Helens 1980 volcano - Population of 2.5million who live near the area

- VEI of 5
- Lahars destroyed over 200 homes, 27 bridges, 185 miles of road
- Ecosystem was destroyed by the lahars killing all fish life and over 7,000 big animals e.g. elk
- Causing a magnitude of 4.2 earthquake shortly after
- Killing 57 people

Mont Etna 2002 volcano

- No deaths
- The Italian Government declared a 'state of emergency' in the eastern half of Sicily, after a series of earthquakes accompanying the eruption caused thousands of people to flee their homes.
- A ship equipped with a medical clinic was positioned near Catania - to the south of the volcano- in preparation for the emergency. Additionally, emergency workers dug channels into the Earth in an attempt to divert the northern flow away from the town of Liguaglossa. Schools in the surrounding towns had to be shut down as a safety precaution.
- **Short term / Immediate response**
    - People moved out of area
    - US army helicopters drop 2 tonne concrete to stop lava flow
    - Earh dams are built to redirect lava flow
    - Italian government gave £5.6million of aid
- **Long term**
    - Rebuilding Damaged buildings
    - Scientists improve monitoring of volcano
    - More planning of emergency service and evacuation plan
    - User tourism to generate money and income for the area

Mont Soufriere Hills 1997 volcano

- 19 people killed
- Lahar destroyed large areas of Montserrat
- **Short term / Immediate response**
    - Evacuation
    - Abandonment of the capital city
    - British government gave money for compensation and redevelopment
    - Unemployment rose due to the collapse of the tourist industry
- **Long term**
    - An exclusion zone set up in volcanic region
    - Volcanic observatory built to monitor the volcano
    - New Roads and new airport built
    - User tourism to generate money and income for the area
    - Soil fertility improved due to the ash deposits
    - Tourism has increased thus boosted economy

California 2003 earthquake - Population of California 35.25 million , area affected population 24,000

- Magnitude of 6.5
- 3 people died
- Epicentre not dear densely populated area
- Happened along a conservative plate margin of two plates that run parallel to the San Andreas Fault
- 80 buildings were damaged

L'Aquila 2009 earthquake – Population of 72,913

- Magnitude of 5.8
- Destructive plate boundary, African plate colliding with the Eurasian Plate sub-duction resulting in fault stress
- Cost of Damage £15 billion
- 290 deaths mainly from collapsed buildings
- Over 1000 people were injured
- 39,500 made homeless
- 11,000 buildings damaged
- Water pipes was broken due to collapsed bridge

South East Asia 2004 Tsunami

- Earthquake caused the tsunami, which involved the subduction of the Ino-Australian plate(Oceanic) under the Eurasian plate(Continental)
- The Uplift of the sea floor caused a displacement of billions of tonnes of water setting in motion a tsunami wave.
- Killing people in 14 different countries around the Indian Ocean, totalling over 250,000 deaths
- Highest death toll in Indonesia Island of Sumatra where over 130,000 were killed and over 30,000 missing
- 500,000 people were made homeless
- Over 80,000 houses were destroyed
- Tsunami also caused diseases such as cholera and dysentery spread due to the lack of clean water and sanitation in the refugee camps killing an estimate of 150,000 people
- **Immediate response(Short Term):**
    - Bodies were buried in mass graves to help prevent the spread of diseases
    - Over 7$billion was provided by governments and NGOs in aid
    - 5million people had to be relocated into temporary refugee camps
    - Took months to clear the debris before rebuilding could start
- **Long Term response:**
    - The Indonesian government decided to relocate the people from the refugee camps to straight into new homes
    - A tsunami early warning system was installed in the Indian ocean cost $20 million.

Japan 2011 Tsunami

- Caused by the 9 magnitude earthquake on the 11th March, the reason for that quake was because of build-up in strain energy as the Pacific plate subducted under the Eurasian plate.
- 15,853 Deaths
- 6,023 Injured
- 3,282 Missing
- 300,000 buildings destroyed and future 1 million damaged
- Damage cost $235 billion, earthquake alone ranged from $14.5 to $34.6 billion
- **Before event occurred what japan had:**
    - 40% of Japan coastline has sea walls of up to 10m high to withstand incoming tsunami
    - The Japanese Meteorological Agency, set up for the prediction of earthquakes and tsunami
    - The Prediction of the tsunami for this event just 3 minutes after the major earthquake, giving people 20minutes to get to safety
    - Buildings in Japan are also designed to cope with Earthquake
    - Japan had its army on site very quickly after the event
    - GDP $34,00
- **Immediate response(Short Term):**
    - People got outside during the earthquake and the response to the Earthquake was reasonably good, the warnings from the JMSA also helped save lives.
    - Not a lot of people reacted quickly to the Tsunami alerts
    - Over 340,000 displaced people in the region needed, food, water and shelter
    - Japanese government responded by sending in specially trained people such as the Self-Defence Force
    - Many countries such as UK sent search and rescue teams to help survivors
    - Japanese Red Cross reporting $1 billion in donations
- **Long term Response:**
    - Just 6 days after the quake a motorway was repaired, shows the incredible rapidity with which the Japanese can work with their capacity to cope
    - Better and improved warning and motoring systems where put in place.