# Why are some volcanoes more hazardous than others essay

There are several reasons that influence volcanic hazards, these include the viscosity of the magma, proximity to population centres, materials that are ejected from the volcano, the magnitude of the eruption and the plate margin that the volcano rests upon. The viscosity of the magma depends on 3 things, the temperature, dissolved gasses and the chemistry involved in the magma. These factors produce 2 main types of magma called acid and basic. The acid lava is the more viscous (66%+ rich silica) and so this is the more hazardous lava as it has more potential for explosion.

The other, less viscous lava is the basic lava which has a 44-52% silica content and has a higher temperature of 1000-2000 degrees compared to the 600-1000 of the acid lava which allows the basic lava to run more smoothly and more fluid like. Most volcanoes occur at a plate margin because this is the area where the magma is produced. At constructive (divergent) plate margins the magma is produced by the melting of the mantle below the surface and so this produces a basic lava which allows it to flow easily.

These types of volcanoes eg, Mid-Atlantic Ridge erupt frequently but do not produce devastating results, they are associated with lava flows and ash. On the other hand volcanoes on destructive (convergent) margins (plates moving towards each other) are much more violent and hazardous. The formation of an ‘ acid magma chamber’ is caused by one plate subducting below the other which causes intense pressure and heat causing the melting of rocks and sediment.

Because the lava is very viscous and doesn’t flow very easily it allows huge amounts of pressure to build up which can lead to a catastrophic eruption involving pyroclastics. 5% of the worlds volcanic material is erupted at conservative margins however 80% of the worlds most active volcanoes occur at destructive plate boundaries. The power of a volcano when it erupts plays a major part in how hazardous it is. The explosive is measured by the volcanic explosivity index (VEI). Non explosive eruptions mainly produce lava flows which aren’t a huge hazard to humans as they can be cooled and controlled before anything major happens. It only poses a threat when part of a crater collapses and large quantities of fluid lava is released.

However at explosive eruptions it is a much greater danger to humans as they create a number of deadly natural events. The first of which is the ash cloud which is molten rocks which is spewed out of the volcano and carried in the atmosphere for tens of kilometres. These ashclouds can cause aircraft problems and the most famous event was when Mount Vesuvius erupted and covered the city of Pompeii with 3m of ash and killed over 2000 people. Another disaster caused by explosive volcanoes is pyroclastic flows which contain ash, rocks and deadly gases and devastate everything that stands in its path.

Eg Mt Helens in 1980. Finally tsunamis which are huge waves which are generated when the volcano erupts out to sea, these are potentially very dangerous particularly to coastal areas. These tsunamis can reach extreme heights eg. Krakatoa triggered a wave 35m in height and killed over 36, 000 people. Less violent earthquakes may still be as hazardous as the most

violent volcanoes on Earth because of their situation and their proximity to population centres.

People tend to live near volcanoes because of the fertile spoils that the posses however these areas can be used for people who can’t afford anywhere else or the space is very limited eg Japan. So depending on how close the volcano is to cities or towns can significantly affect the hazard level of the volcano. The frequency of the volcano and the perception of risk plays a big part in the hazard of volcanoes because if we look at the Hawaiian Islands the volcanoes are constantly erupting there and spilling lava however this poses very little threat to the residents nearby.

This also produces a tourist attraction in some cases and brings money to the area so other businesses can grow there periodically eg hotels and cafes. This is quite the opposite for destructive margin volcanoes as eruptions are infrequent (100’s of years may lapse between eruptions). For example Soufriere Hills on Montserrat had not erupted in 350 years but by 1995 it was ‘ back to life’. These can bring a hazard in itself because people will begin to think that because the volcano hasn’t erupted recently it wont erupt for the time period they live there and get caught out.

Finally prediction and forecasts of eruptions is very important to minimise the effects of volcanoes. Scientific equipment is used nowadays to investigate the volcanoes and see when it will erupt however in areas of less income these high tech machines may not be available, therefore this can cause more devastation as there will not be enough time for complete evacuation and lives may be lost. In some cases scientists may get it

completely wrong and therefore governments and residents will be more likely to ignore them.

This was proven to be fatal in Colombia when Nevado del Ruiz erupted and killed 25, 000 people despite warnings made by the scientists. To conclude there are 2 major reasons that allows different volcanoes to be more hazardous than others, these are the physical differences eg lava and the plate boundary and the human factors associated. The ability to predict when the volcano will erupt and the population density of that area can significantly reduce the level of danger the volcano possesses so it is not just how powerful the volcano is.