Systems and Life Cycles

Disaster of Natural Causes: Earthquake in Haiti

On 12th January 2010 a devastating 7.0 magnitude earthquake hit Haiti, leaving more than 200,000 killed, 1.5 million displaced, and over 300,000 buildings destroyed.

1. Mitigation: Understanding and mapping out a hazardous disaster beforehand is a major key in reducing damages. The political, economic and social conditions in Haiti made it difficult to establish such an early warning system. Haiti was known to be at risk to a major earthquake due to the buildup of stress along the fault line upon which Port-au-Prince sits. However, Haitian officials did little about it due to the fact that Haiti is a relatively poor country and daily needs are more pressing than long term issues.
2. Preparedness: Haitians were not very prepared for an earthquake to occur. One, most Haitians themselves were not schooled in how to react, such as sheltering under tables and staying away from glass windows, in the case of an earthquake. This was one reason some 220,000 were killed. There was also only three earthquake resistant buildings in the entire country.
3. Response: The country's immediate response to the earthquake was to conduct rescue searches for survivors, although this was difficult due to the loss of government officials, hospitals, electricity, and other such necessities. International response however was tremendous. For example, President Obama deployed over 20,000 US civilians and military personnel to help with rescue operations and medical services. Also many Americans donated necessary supplies such as food, water, and clothing.
4. Recovery: The overall environment in Haiti has improved greatly since the earthquake occurred. Due to international help, the range of medical care in new, more stable hospitals, is greater than was before the disaster. However, the earthquake destroyed 60 per cent of the health facilities and 10 per cent of the medical staff were either killed or left the country so the major issue now is forming a new Haitian medical staff that can support the country with less international help. Food and water supplies has also improved greatly due to supply and money donations from all over the world, however it is still in low supply and demand is still needed. Shelter is a major issue being focused on. Preventing these types of effects happening again is needed. They are working on new building structure plans that are earthquake-resistant, however obviously money is still an issue and this will take a great amount of time. The UN is helping Haiti rebuild their government to provide a more stable official environment. Overall, Haiti is improving, however even six years later much work is still needed to be done.

Particularly, the mitigation and preparedness stages are most likely to blame for such devastating outcomes. Due to financial instability of the country, preparing for a disastrous earthquake was nearly impossible, however when one did occur it hurt the country even more. If the country addressed a possible situation like such, the effects such as the number of people

killed or amount of buildings collapsed may have been reduced. This could have helped make the recovery stage a little bit easier.

Disaster caused by human activity: BP oil spill in the Gulf of Mexico

On April 24 2010 a BP oil rig begins to leak oil into the Gulf of Mexico killing tons of wildlife and taking almost a year to stop the flow and safely secure the leake.

1. Mitigation:The oil spill in the Gulf of Mexico caused by BP had a tremendous effect on the environment and local wildlife. The disaster was caused by human error and mistake, and the issue starts with how BP used their technology to prevent possible spills. In order to be allowed to drill, companies must pass a series of safety tests in order to ensure the safety of their oil rigs. This includes checking the different safety precautions they have such as pipelines employ computers, electromagnetic instruments, and ultrasonic devices that detect and report vulnerabilities in order to proactively maintain and repair equipment. Also companies continue to redesign tankers that hold oil with new features such as double hulls in order to prevent leaks, and made with special material to prevent corrosion.
2. Preparedness: With these new technologies and safety precautions, the preparedness for most oil rigs for the time of a spill is fairly high. The issue arose in the fact that BP was doing a very poor job in testing their equipment such as their blowout preventer. Reports show that the failures came out of the fact that there was faulty wiring, dead batteries, and bent pipes that could have been seen and fixed if the proper testing was done.
3. Response: Although there was a mistake in the preparedness and mitigation of the BP system, they did however do their best in order to fix and recover from their error. BP at first lost public trust by attempting to deflect the blame elsewhere. However, they eventually took responsibility for their action and worked with the federal government in order to minimize the damage done. At the peak of the response effort, it involved the mobilization of around 48,000 people and the deployment of around 2500 miles of boom to contain/absorb the oil. BP continued to pour millions of dollars into trying to fix their mistake. Their first job was to stop the oil from dumping into the ocean. After many trials and errors, BP and the government were finally successful in stopping the flow of oil by installing a smaller blowout preventer to replace the one that had failed and caused the incident to start with. Their next step now was pushing the remaining oil back into the earth so the pressure in the pipe didn't burst. This was eventually achieved by drilling another drill hole at an angle about 5 kilometers from the original one and sealing the hole for good with cement.
4. Recovery: BP had since asked the federal government to continue drilling in the gulf in order to continue to supply its large customer base with oil. Though they are drilling it will be hard to ensure an event like this does not happen again unless the world's demand for oil will decrease. The world uses approximately one barrel of oil per second, and unless this massive amount is decreased companies will be forced to meet the demand with the proper supply by drilling and risking another spill and disaster. However, BP has committed to the long term effort to improve research and understanding of the wildlife

and ecosystem of the gulf of Mexico. They are doing this to better mitigate the potential impacts of another oil spill and work on better technologies to prevent it from happening again.

The biggest blame should be on the preparedness of BP for the spill. Though they had all the proper equipment and ability to check and ensure that any spill is stopped immediately, they did not properly ensure everything was in order and working properly which caused the inevitable accident to turn into a huge incident. If they had properly kept all their equipment and safety precautions up to date, this event could have been a minor mishap and never really cause significant damage.

The post disaster shelter systems

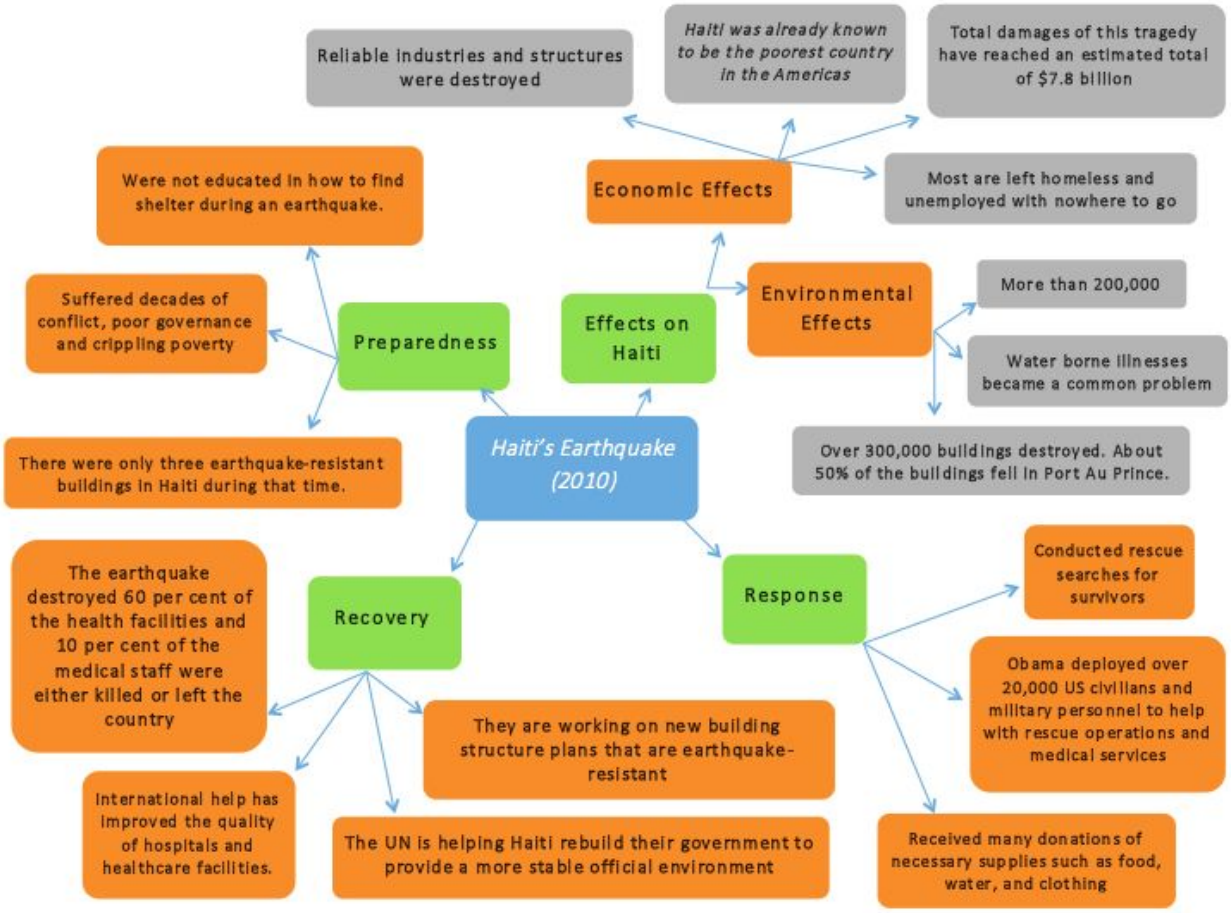
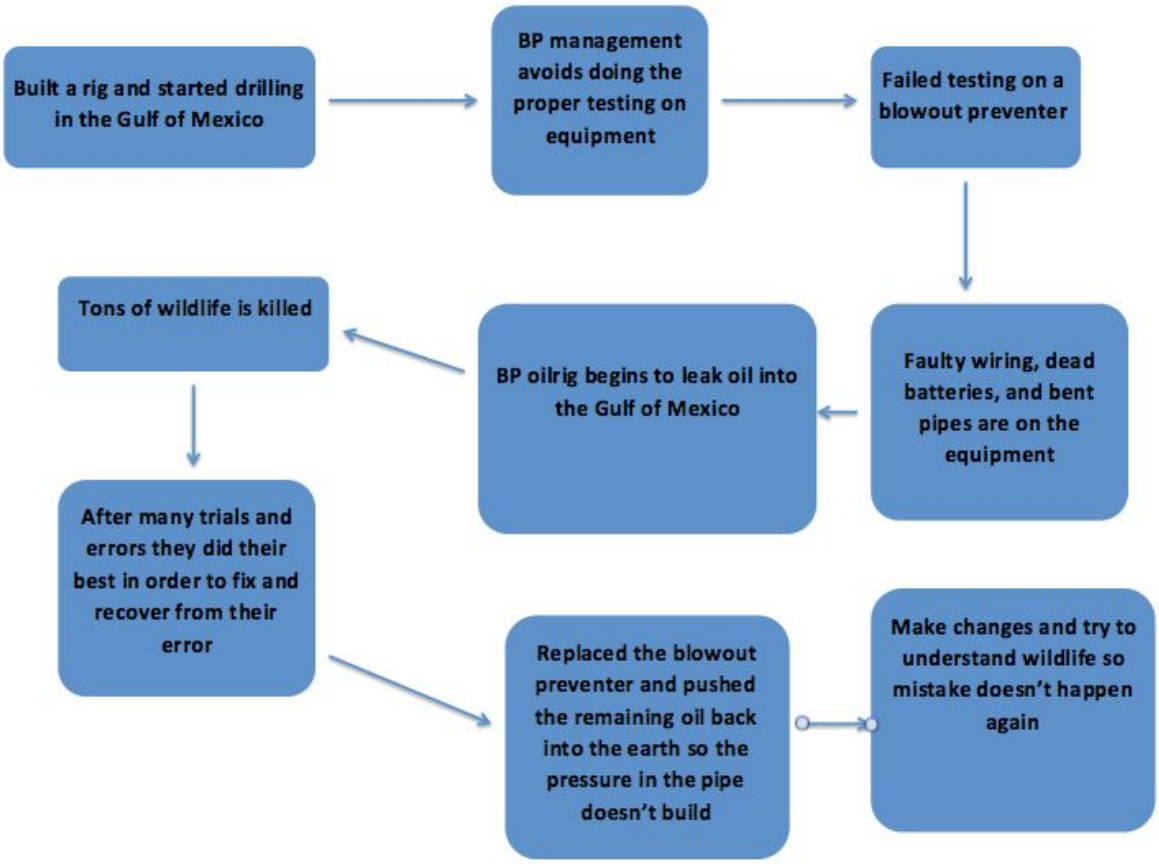
Japan's earthquake prevention system

Haiti is not the country where earthquakes are expected; people in Haiti could not reduce damages by earthquakes. Since Japan is the country where earthquakes have been expected, Japan has the system to predict earthquakes and be prepared. The government established a high-density earthquake observation network. The National Research Institute for Earth Science and Disaster Prevention monitors land surface movements in about 1800 locations. Almost every earthquake occurred in Japan can be measured by the network. To reduce damages by earthquakes, Japan has earthquake resistance standards for buildings. The government predicts injuries and death due to collapse; the buildings should be highly resistant to earthquakes. Also, people are educated how to react when an earthquake occurs an emergency earthquake early alert has been running to notify earthquakes to people earlier to make them prepared. Systems like these are expensive however and difficult to install in third world countries such as Haiti.

Oil spill prevention

BP oil spill in the Gulf of Mexico was one of disasters caused by human activity. BP had ignored possible spills and skipped safety tests and testing some of equipments that prevent oil spill. The equipments include pipelines employ computers, electromagnetic instruments, and ultrasonic devices. Those find and report any error in the system and prevent spill incidents. Specific Spill Prevention, Control and Countermeasure Plans (SPCC) is one of procedures that operators can follow to prevent oil spills. The procedure require regular testing and inspection of both oil producing processes and equipment. Furthermore, all employees should be educated with prevention of oil spills and safe operations. By ensuring safety and the safe use of equipment, spill incidents could be prevented. Certification programs for oil production would also prevent possibility of oil spill. By ensuring companies do not avoid these requirements it will help prevent disaster in the future.

Natural Disaster: Concept Map



Human Activity: Process Flow Diagram