

# Natural Disasters



# Types of natural disasters



- **Geological:** Geological disasters include avalanches, landslides, volcanic eruptions, sinkholes and earthquakes.
- **Hydrological:** The main hydrological disasters are floods, limnic eruptions and tsunamis.
- **Meteorological:** Meteorological disasters include blizzards, cyclonic storms, hailstorms, ice storms, heat waves, cold waves, thunderstorms, droughts and tornadoes.
- **Wildfires:** Wildfires are natural disasters which occur naturally due to droughts and lightning but are also often caused by humans.
- **Space disasters:** Space disasters include impact events of meteors or asteroids and solar flare. Impact events mean that the earth will be eventually hit by a meteor or asteroid. Solar flare refers to an event when the sun releases large amounts of solar radiation, which can destroy our electrical equipment on earth if the radiation is strong enough.

# Causes

- Global warming
- Natural activities in the earth's crust
- Tectonic movement
- Moon activity
- Mining
- Deforestation
- Soil erosion
- Seismic activity
- Air pressure
- Ocean currents
- Pollution



# Global warming



- Global warming is a great cause for natural disasters since it affects our planet in several different ways.
- Global warming leads to an increase in temperature of oceans, which in turn leads to more and stronger hurricanes and tropical storms since hurricanes get their energy from the sea water.
- Moreover, the probability of droughts increases since the planet's average temperature increases.
- It is quite difficult to prove the causal connection between climate change and natural disasters since there are many other variables, but the increase of natural disasters over the last decades likely leads to the conclusion that global warming is a major contributor to natural disasters.

# Natural activities in the earth's crust

- Natural disasters are also caused by natural activities in the crust of the earth.
- Natural processes can cause tension inside the earth's crust which are sometimes released through earthquakes.



# Tectonic movement

- Since the earth is not made up of one single surface but instead of many plates sliding on our planet's underlying mantle, a shift or collision of these plates can have severe adverse effects.
- This can lead to earthquakes, volcanic eruptions and tsunamis.



# Moon activity

- The moon is known to have a strong influence on the natural processes on earth.
- According to latest studies, researchers found that the moon has the potential to cause huge earthquakes which may cause huge amounts of destruction and death.



# Mining

- It is controversial whether mining activities can cause natural disasters.
- Some scientists blame mining for landslides and soil and mountain erosions.
- Others argument that landslides occur naturally due to heavy rainfalls and flashfloods.
- Mining can thus potentially contribute to the emergence of natural disasters, although it is not a main driver.



# Deforestation

- Deforestation can contribute to an increase in natural disasters since forest usually prevent floods and droughts since they balance and hold back natural groundwater resources.
- By deforestation, the ground is no longer covered and thus the probability for floods and droughts increases dramatically.



# Soil erosion

- Soil erosion can lead to a high level of degradation of land, which in turn can lead to a loss in fertility and thus to famine for local populations.
- Soil erosion can also cause landslides which can cause serious damage to nature as well as to humans.



# Seismic activity

- The seismic activities inside our earth can cause earthquakes.
- These earthquakes can cause death and injuries for many people as well as for animals and other life forms.
- It also leads to a loss of many homes so that people who survived often have to leave their home countries in order to find a better future.



# Air pressure

- There is a connection between the air pressure and some natural disasters like hurricanes, heavy rains and thunderstorms.
- Thus, air pressure naturally contributes to natural disasters in a certain way.



# Ocean currents

- Changing ocean currents can lead to a change in the ocean temperature which in turn can harm or even kill large populations of fish and other sea animals and plants.
- Moreover, changing currents and therefore a possible local increase in water temperature can lead to a higher probability for hurricanes or tropical storms.



# Pollution

- Since our nature is a quite sensitive organism, pollutions of all sorts may lead to an imbalance of the earth which in turn may create natural disasters of several sorts.



# Effects

- Environmental issues
- Humanitarian crises
- Damages to infrastructure
- Public health issues and diseases
- Food scarcity
- Water scarcity
- Displaced population
- Injuries
- Death
- Emotional shocks
- Economic impact



# Environmental issues



- There are severe effects of natural disasters on the whole environmental system.
- Hurricanes and other storms can destroy the lives and also the livelihood of many people, especially of those who live near the coast since they are also in danger of tsunamis.
- Moreover, draughts may lead to a migration of many people who just will no longer be able to make their living in their home countries since there is not enough water left to grow plants or to raise cattle.
- Natural disasters not only have dramatic effects on humans but they also destroy the habitat of many animals and plants which may in the worst case even become extinct.

# Humanitarian crises

- Natural crises lead to humanitarian catastrophes all over the world.
- This includes an increase of famine and also the spread of diseases, especially in poor developing countries since they will often not be able to fight the consequences of natural disasters in an effective way due to a shortage of resources and also due to a lack of technological knowledge.
- Natural disasters may force many people to migrate to other countries since their livelihood has been destroyed and thus they will strive to search for a better life in other places on earth.



# Damages to infrastructure

- Natural disasters usually also imply great damage to the affected infrastructure.
- This includes the destruction of important buildings like hospitals or airports.
- Moreover, roads may be blocked through trees and thus the transportation system may collapse as a result of natural disasters.



# Public health issues and diseases



- Natural disasters often destroy many important facilities which are meant to keep living conditions stable.
- If these facilities are destroyed, there will likely be an increase in diseases since the hygienic conditions dropped as a consequence of the natural disaster.
- Making things worse, natural disasters often also destroy hospitals and other medical facilities.
- This means not only the likelihood of diseases increases due to lower hygienical standards, also the supply of medicines will be more difficult.
- As a result, it is more likely that people will not be able to recover from their diseases.

# Food scarcity

- Another effect of natural disasters can be a scarcity of resources, which is especially severe when it comes to the supply of food.
- If large areas of land have been destroyed by natural disasters, farmers will no longer be able to harvest enough crops or to raise enough cattle in order to meet the demand.
- Thus, the local population is likely to suffer from starvation.



# Water scarcity



- Another related issue is the topic of water scarcity.
- Due to natural disasters, natural water sources like rivers or lakes may be polluted and thus the water supply will be decreased dramatically.
- A scarcity of water supply will be especially severe when draughts hit areas for a long period of time.
- Farmers will no longer be able to raise enough crops.
- Moreover, even the drinking water will become a scarce resource which may eventually lead to migration since water is essential for all life on earth.

# Displaced population

- Due to natural disasters, people often lose all their belongings, including their houses and their livelihood.
- If this happens, they have to decide if they will be able to rebuilt all of it or if they instead see a better chance to move to other countries in order to be able to find a better future there.
- There will be an increasing number of migrants in the future due to the fact that global warming will greatly reduce the fertility make many areas since their will not be enough water left to grow crops or to raise cattle.
- Thus, many people will be forced to leave their homes and to migrate to other countries.



# Injuries

- Many people will suffer from injuries caused by natural disasters.
- Making things worse, medical treatment in the affected areas will be quite limited since many medical facilities may have been destroyed as well.
- It will therefore not be possible to treat many injuries in an effective way which may cause adverse long term health effects.



# Death

- Many people lose their lives as a consequences of natural disasters.
- Natural forces are simply too strong to save all people.
- Moreover, especially in developing countries, warning systems are often not good enough to be able to safe the lifes of many people.
- In addition, medical facilities are often not advanced enough and will not be able to deal with a large number of heavily injured people at once, which may result in increased mortality.



# Emotional shocks

- Apart from physical injuries, many people will also suffer from mental conditions since they will not be able to process and handle the consequences of natural disasters appropriately.
- Many people lose their children or other family members to natural disasters which will shock them emotionally for quite a long time or even for their whole life.
- It will take a long time for many people to recover from these kinds of emotional horrible events.



# Economic impact

- To make things worse, there are usually great adverse economic effects from natural disasters.
- For example, an earthquake can lead to a devastation of large areas of land. People will no longer be able to make their living from farming in these areas.
- Thus, they will lose their livelihood because of the result of these disasters.



# Solutions

- Emergency measures
- Investments in risk reduction
- Information sharing on newest research findings
- Reforestation
- Stable buildings
- Education
- Technology
- Governance
- Economic support



# Emergency measures



- Since we will not be able to entirely stop the occurrence of natural disasters, it is crucial to do our best to mitigate the adverse effects.
- This means having effective early warning systems in place which advise people to search for shelter before natural disasters hit.
- Moreover, the medical facilities have to be secured against natural disasters so that injured people will be able to get medical support.
- In addition, governments in high-risk countries should make agreements to help each other in case one country is affected by a natural disaster.
- With these emergency measures, the effects of natural disasters can be mitigated to a significant degree, even though we will never be able to protect all people from the horrible adverse effects.

# Investments in risk reduction

- Investments in risk reduction may also protect people from the adverse effects of natural disasters.
- This could mean taking prevention measures even before natural disasters occur.
- For example, countries can build barriers which in case of a tsunami prevent it from hitting the coast.



# Information sharing on newest research findings

- It is crucial that countries all over the world share their newest findings and insights on measures for how to protect people from the effects of natural disasters.
- Since developed countries usually have larger budgets for research, they should supply developing countries with insights that helps these countries to take actions against natural disasters.



# Reforestation



- Reforestation is an effective measure against some natural disasters, especially against landslides, droughts and floods.
- The roots of trees hold the soil together and also store large amounts of water.
- Moreover, reforestation is also a counter-measure to the issue of global warming.
- Global warming also contributes to an increase in natural disasters since it increases the sea temperature which contributes to more powerful storms.
- Thus, reforestation can indirectly contribute to a decrease in the probability of hurricanes and other storms.

# Stable buildings



- We have to make sure that our buildings are able to survive strong storms and also earthquakes.
- This is possible with our current knowledge, however, it takes quite advanced building techniques in order to achieve these kind of buildings.
- Moreover, poor countries may often have not the knowledge nor the resources to build stable homes.
- Thus, especially people in these countries must improve in order to be more resistant to natural disasters.
- It is in the responsibility of developed countries to provide help and share insights in order to make buildings more resistant to natural disasters, also in poor countries.

# Education



- Education plays an important role in the context of natural disasters.
- On the one hand, it helps people to understand how they contribute to natural disasters in their daily lives.
- For example, our consumption behavior leads to increase in the speed of global warming which in turn leads to more storms.
- On the other hand, education also helps people in the sense that they will be taught on how to behave in case of emergency and thus hopefully to be able to save their lives.

# Technology

- Technology is an important part in the overall picture to deal with natural disasters.
- Although we will never be able to fully prevent all kinds of natural disasters, technology can help to mitigate the adverse consequences of these events.
- For instance, improved early warning systems can save many lives which would otherwise be lost due to tsunamis or other natural disasters.



# Governance

- Emergency plans on how to behave in case of natural disasters have to be prepared and improved by governments in the affected areas over time.
- Through profound emergency plans, many people will be able to survive natural disasters.
- Governments have to make sure that these plans are up to date and also adjust them when they get new insights.



# Economic support

- Since the biggest natural disasters often happen in poor countries, rich developed countries can help them with financial support in order to recover from the adverse consequences.
- For example, it will take lots of money to rebuild the destroyed infrastructure.
- This can be accomplished much faster if financial support is supplied by other countries.



# Historical natural disasters

- 526 Antioch earthquake
- 1138 Aleppo earthquake
- 1556 Shaanxi earthquake
- 1839 Coringa cyclone
- 1881 Haiphong typhoon
- 1887 Yellow River Flood
- 1920 Haiyuan earthquake
- 1970 Bhola cyclone
- 1976 Tangshan earthquake
- 1992 Hurricane Andrew
- 2003 Bam earthquake
- 2004 Indian ocean earthquake and tsunami
- 2005 Hurricane Katrina
- 2005 Kashmir earthquake
- 2008 Sichuan earthquake
- 2008 Cyclone Nargis
- 2010 Earthquake in Haiti
- 2011 Tōhoku earthquake and tsunami



# Conclusion



- Natural disasters are a great threat to humanity.
- Although they occurred long before the first human populated the planet, we likely contribute to an increase in natural disasters through our behavior.
- The number of natural disasters seems to be positively correlated to an increase in the earth's temperature.
- Since we contribute to global warming through the emission of greenhouse gases, we also indirectly contribute to an increase in natural disasters.
- However, we will not be able to entirely prevent natural disasters to happen.
- Instead, we should improve our emergency measures in order to save as many people as possible.
- All countries should work together in order to mitigate the problem of natural disasters and ensure a livable future for future generations.

# Sources

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