



Forum:	Environmental Council
Issue:	Responding to and minimizing the consequences of more frequent and extreme natural disasters due to climate change
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Description of the issue:

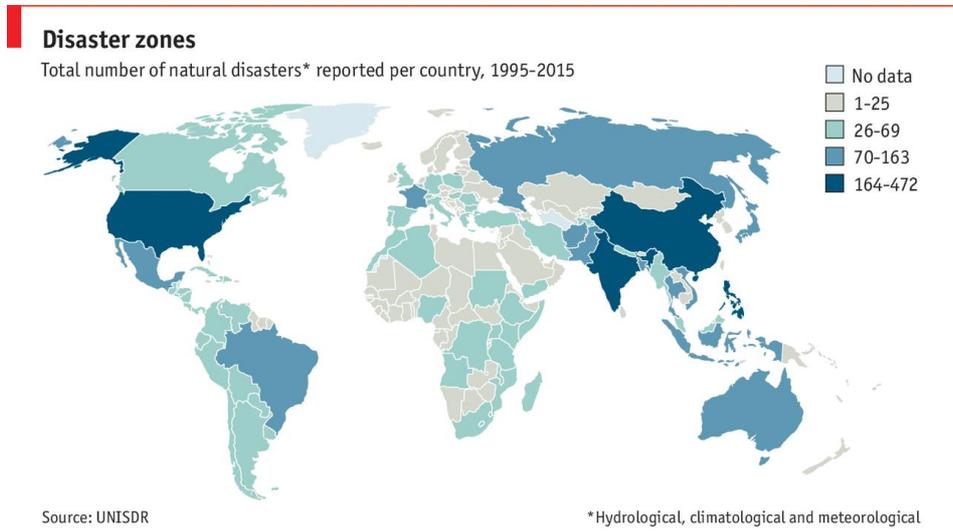
The anthropogenic climate change is responsible for more frequent and extreme natural disasters. As global warming is caused by increasing concentrations of greenhouse gases trapped in our atmosphere and is therefore manmade, proper responding by minimizing the consequences is necessary. The main greenhouse gas, carbon dioxide (CO₂), and changes in agriculture and land use have been held accountable for global warming, as fossil fuel use has increased quickly since the industrial revolution. The concentration of carbon dioxide has increased by about one-third in the past 250 years (from 280 parts per million (ppm) in 1750 to 368 ppm in 2000)¹. This may be the highest level in the past 20 million years. A higher average of temperature is the atmosphere's response to the rising greenhouse gas concentrations. Over the past century, the global mean surface temperature has risen by 0.6 degrees celcius², with land areas warming faster than oceans. The change in temperatures have a range of secondary effects on the earth's ecosystems, including an increase of the mean sea level, widespread retreats of glaciers, the snow cover and permafrost, shifts of plant and animal ranges and more frequent coral bleaching events. Climate change will continue for several decades and actually centuries even in the most optimistic emission scenarios. However, those can only be achieved by a massive transition to alternative energy sources. Events of extreme weather have already been observed due to the increase in the number of hot days and the decrease of cold/frost days in nearly all land areas caused by the general rise in temperature. It is safe to say that polar regions warm faster than tropical areas and land in general warms faster than the oceans. The intensity of storms will increase as more water vapor evaporates in the atmosphere

¹ <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> via IPCC (2001c) Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge

² <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> via IPCC (2001c) Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge



becoming fuel for more powerful storms. Moreover, the wind speed in tropical storms increases caused by warmer ocean surfaces. In addition, the hydrological cycle will become more intensive, which results in more humid climate. In regard to more extreme natural disasters, the map below shows disaster zones over a period of 20 years.

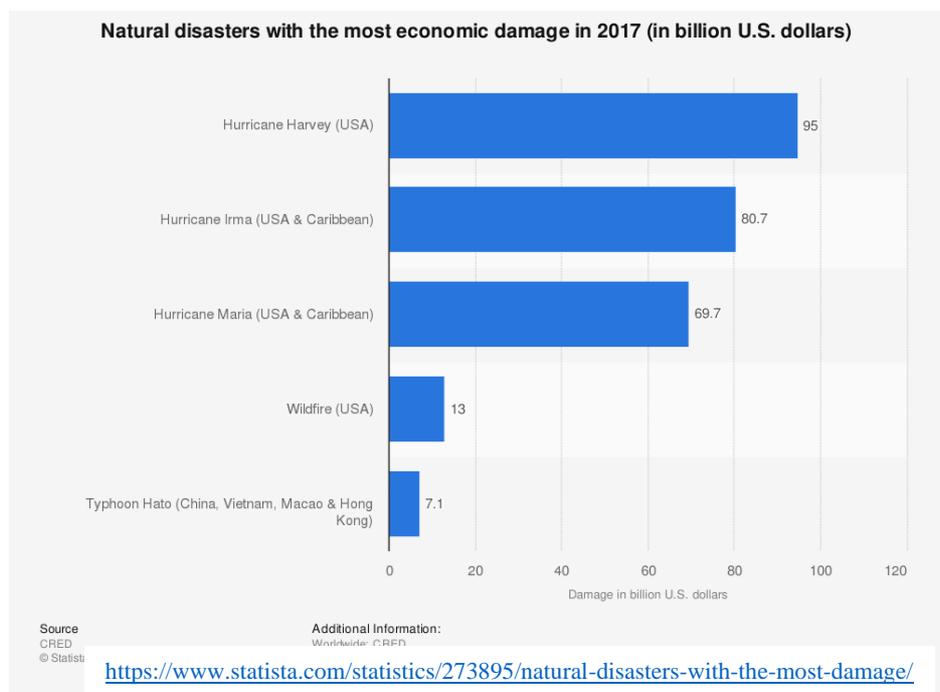


In North America, an increase in intensity and duration of heat waves is to be expected. The same applies to Latin America which will result in a gradual replacement of tropical forest by savannah. In Europe, the risk of inland flash floods will increase, as well as erosion from storms. The sea level rise will bring about more

https://www.economist.com/img/b/1280/769/90/sites/default/files/20170902_WOC211_1.png

frequent coastal flooding. Over the past decades the droughts' intensity has increased in Africa and will continue to do so, resulting in increased water stress. In Asia, droughts are to be expected in some regions, however, other areas will be at risk due to flooding. Generally speaking, the frequency of extreme precipitation events is likely to increase in many areas and mainly mid-continental regions will become dryer which will increase the likelihood of summer droughts and wildfires.

This statistic on the right hand side shows the five most expensive natural disasters in 2017, as they caused the most economic damage. Especially, the United States suffers from more frequent and intense natural hazards.



However, in some areas, global warming will initially boost agriculture productivity and reduce the demand for energy for heating in winter. Nonetheless, the balance of impacts will become more negative as climate change progresses. More impacts, for instance, loss of ecosystems, won't be reversible and human systems will depend on the ability to adapt to those changes.

**Background information:**

It is very likely that during the twenty-first century the number of hot days will increase due to higher maximum temperatures and therefore, heat waves over nearly all land areas will be more frequent. Social concerns ensuing are more deaths and serious illness in older age groups and among the urban poor. Furthermore, wildlife will be subjected to continuous stress due to heat. During the heatwave in Europe in 2003, between 22.000 and 35.000 mainly elderly people were killed³. The economy lost about \$ 13 billion that summer⁴ and economic losses will continue in some regions as tourist destinations will shift. Furthermore, there is an increased risk of damage to crops. As the temperatures get higher the demand for electric cooling increases and energy supply reliability is reduced. However, heat waves only become disasters due to the societies' inability to respond properly to the meteorological conditions. Heatwaves can be predicted at least three days in advance and therefore, continuously establishing warning systems helps societies to improve their preparedness. An increase in the number of hot days goes hand in hand with fewer cold and frost days across nearly all land areas. However, the latter aspect might also have positive side effects: cold-related human morbidity and mortality will decrease, as well as the risk of damage to crops. In many areas, for example in Europe or in the United States, there is a likelihood of 90-99% of more intense precipitation events⁵, leading to increased flood, landslide, avalanche, and mudslide damage. Not only does reconstruction cause high costs, but it increases pressure on governments and private flood insurance systems as they have to figure out proper disaster relief. Crops may suffer from floods as well, as soil erosion will increase due to more intense precipitation. By 2030, 700 million people are at risk of being displaced as a result of droughts⁶. As summer drying increases over most mid-latitude continental interiors, some regions may become uninhabitable as farmers won't be able to do their work due to decreasing crop yields. Moreover, it is likely that the damage of building foundations increases caused by ground shrinkage. As water resources are lost in quantity and quality, water scarcity alone could cost some regions nearly six percent of their GDP by 2050⁷. This could trigger mass migration and conflicts over the

³ <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> via IFRC (International Federation of Red Cross and Red Crescent Societies) (2004) 'Heatwaves, the developed world's hidden disaster'. World Disasters Report 2004. IFRC, Geneva. pp. 36–55

⁴ <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> via IFRC (International Federation of Red Cross and Red Crescent Societies) (2004) 'Heatwaves, the developed world's hidden disaster'. World Disasters Report 2004. IFRC, Geneva. pp. 36–55

⁵ <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> based on IPCC (Intergovernmental Panel on Climate Change) (2001a) 'Summary for Policymakers'. Climate Change 2001: Synthesis Report. Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge. pp. 1–34

⁶ https://www.who.int/health-topics/drought#tab=tab_1

⁷ <https://www.unccd.int/actions/drought-initiative>

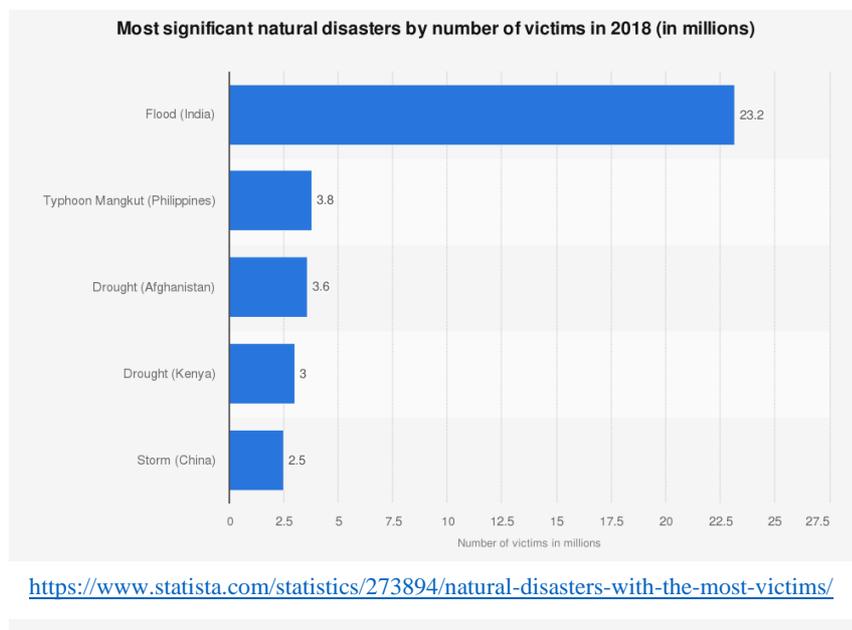


diminishing resources. In some regions the risk of wildfires will increase and the fires will become more destructive and long-lasting, as seen in Australia in the beginning of this year.

Human life will increasingly be at risk because of higher tropical cyclone peak wind intensities in almost every part of the world, but especially in the Asian Pacific region. As of January 2019, Hurricane Katrina, which struck Louisiana in August 2005, has been the most expensive natural disaster in the US, amounting 161 billion U.S. dollar for damage repair⁸. Almost 2,000 people died during this natural disaster and coastal erosion and devastation of coastal buildings and infrastructure increased, resulting in the most property losses since 1992. North American hurricanes have been held accountable for four out of the five most costly natural disasters from 2010 to 2019⁹.

In addition, the coastal ecosystems suffer from increased damage due to more intense natural disasters. Coral reefs for instance are scattered into fragments by large, powerful waves from hurricanes and cyclones. An entire colony can be killed off by a single storm and algae overgrow the remains before they can recover.

Damages in temperate and tropical Asia are likely to be caused by more flood and drought magnitude provoked by increasing Asian summer monsoon variability. Mid-latitude storms set human life and health at risk and also increase property and infrastructure losses and subsequent damage repair costs.



Especially LEDCs suffer from more frequent and extreme natural disasters. In the past 25 years, 95% of all deaths related to natural disasters occurred in LEDCs¹⁰. Considering the number of victims these countries suffered from the most significant natural disasters in 2018, as shown by the statistic on the left-hand side. Direct economic losses

⁸ <https://www.statista.com/statistics/744015/most-expensive-natural-disasters-usa/#:~:text=The%20total%20costs%20of%20Hurricane,90%20billion%20U.S.%20dollars%20respectively.>

⁹ <https://www.statista.com/statistics/510959/number-of-natural-disasters-events-globally/>

¹⁰ <https://unu.edu/publications/articles/solutions-for-those-at-risk-in-climate-disasters.html#info>



connected to natural disasters are more than twice as high in low-income countries than in high-income countries in relation to national income. Furthermore, insurance in the richest countries covered about 30% of the losses, being about 3.7% of the GNP, from 1980 to 2004. However, in LEDCs only about 1% of losses were insured, those amounted to 12.9% of the GNP¹¹. Many highly exposed low-income countries are not able to raise sufficient capital to replace or repair damages and restore livelihoods after major disasters, because of their lack in insurance plus high indebtedness.

As Nicholas Stern, a British economist, responded when asked for his comment on a policy brief published by the UN about how to move from text to real life action before the UN Framework Convention on Climate Change in Mexico in 2010 (COP 16): “Major catastrophes not only cost many lives and a significant share of gross domestic product, they can also set back development by decades. Adaptation, including better risk management, will help countries prevent and cope better with such catastrophes. Working in parallel to those measures, insurance solutions can help the people and economies affected get back on their feet more quickly.”

Disaster risk reduction and more sophisticated development planning are crucial in order to adapt to the increasing risks associated with climate change. The main problem is that the pace of disaster risk creation is exceeding that of the risk reduction efforts displayed in the sector “UN Resolutions”. A constantly rising number of people is affected and several economic sectors will continue to be damaged if we do not face the problem of our vulnerability to natural hazards as we fail to mainstream disaster risk reduction across all relevant policies and sectors.

Glossary:

GDP – Gross Domestic Product: the total value of goods and services produced in a country

GNP – Gross National Product: this includes the GDP and any income earned by a resident living overseas

LEDC – Less Economically Developed Country (a country in which the average incomes are low)

SFDRR – Sendai Framework for Disaster Risk Reduction (2015-2030)

UNDRR – United Nations Office for Disaster Risk Reduction

UNFCCC – United Nations Framework Convention on Climate Change -> an international treaty ratified by 195 countries, aiming to prevent dangerous man-made interferences with the climate system

Nicholas Stern – a British economist working as a professor at the London School of Economics

¹¹ <https://unu.edu/publications/articles/solutions-for-those-at-risk-in-climate-disasters.html#info>



How to prepare as a delegate:

Dear Delegates,

bear in mind that preparation is key in order to hold a successful debate and therefore, we urge you to research carefully and detailed. Start by collecting basic information about your country in the following categories as this will give you a good overview on your country's positions in general: politics, economy, geography, history, and society. Find out about your country's alliances with others and then start your research on how your country specifically is involved in the topic of extreme natural disasters caused by climate change.

Keep in mind that you as a delegate are required to write at least one draft resolution and two, preferably three, position papers so all topics in the Environmental Council are covered. All documents shall be sent in until the XX XX 2020. Position papers and draft resolutions send in after the deadline will not be corrected. If you are a first timer and are a bit overwhelmed, feel free to reach out.

UN resolutions:

The UNDRR, the United Nations Office for Disaster Risk Reduction, was established in 1999 in order to ensure the implementation of disaster reduction by bringing governments, partners, and communities together, securing a safer and more sustainable future. During the Third UN World Conference on Disaster Risk Reduction (WCDRR) in 2015 the Sendai Framework was endorsed.

The Sendai Framework is the improved successor agreement to the Hyogo Framework from 2005 – 2015, which was developed by UN member states, NGOs, and other stakeholders. On the right hand side there are the seven global targets which are supposed to be reached by 2030. The following link guides you to the latest resolution on natural disaster risk providing an overview



https://www.preventionweb.net/files/43291_targets.png

on the progress made by the adaptation of the Sendai Framework ->

<https://www.preventionweb.net/files/resolutions/2019-SG-Report-English.pdf>.



Generally speaking, the SFDRR portrays a shift in focus from only responding to disaster events to proactively minimizing the risk and the creation of new natural disasters. Mainly the loss of life and economic damage represent how severe disasters are. Compared to the Hyogo Framework the deaths caused by natural hazards have decreased over the past five years which is a huge success¹². Responsible for the death reduction is the improvement of early warning systems, evacuation systems and overall rising awareness implemented through the Sendai Framework. However, realizing less economic damage will be a hard goal to achieve by 2030 as the economy in LEDCs is not able to cover the costs of natural disasters as it lacks financial stability.

Useful links:

<https://sustainabledevelopment.un.org/frameworks/sendaiframework>

- ➔ The link explains how the Sendai Framework works as a proper successor agreement for the Hyogo Framework

<https://unu.edu/publications/articles/solutions-for-those-at-risk-in-climate-disasters.html#info>

- ➔ This link will guide you to a website which suggests a few examples for solution. This may help you coming up with more ideas.

https://www.youtube.com/watch?v=of-yBdlpWko&feature=emb_rel_pause

- ➔ This video explains what we can do against droughts.

<https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/natural-disasters.html>

- ➔ This website gives a good overview on the problems brought up by natural disasters

Sources:

- <https://www.climatecentre.org/downloads/files/articles/Article%20Disasters%20Maarten.pdf> (used on 25th June 2020)
- <https://unu.edu/publications/articles/solutions-for-those-at-risk-in-climate-disasters.html#info> (used on 25th June 2020)
- https://www.usgs.gov/faqs/what-are-long-term-effects-climate-change-1?qt-news_science_products=0#qt-news_science_products (used on 25th June 2020)
- https://www.who.int/health-topics/drought#tab=tab_1 (used on 27th June 2020)
- <https://www.unccd.int/actions/drought-initiative> (used on 27th June 2020)

¹² <https://www.sei.org/wp-content/uploads/2020/03/sendai-deaths-01-1024x683.png>



- https://www.usgs.gov/faqs/how-can-climate-change-affect-natural-disasters-1?qt-news_science_products=0#qt-news_science_products (used on 27th June 2020)
- <https://www.bmu.de/en/topics/climate-energy/climate/international-climate-policy/united-nations-framework-convention-on-climate-change-unfccc/> (used on 3rd July 2020)
- <https://www.statista.com/statistics/510959/number-of-natural-disasters-events-globally/> (used on 3rd July 2020)
- <https://www.statista.com/statistics/510959/number-of-natural-disasters-events-globally/#statisticContainer> (used on 4th July 2020)
- https://oceanservice.noaa.gov/education/tutorial_corals/coral08_naturalthreats.html (used on 4th July 2020)
- <https://www.undrr.org/about-undrr> (used on 4th July 2020)
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- <https://www.sei.org/perspectives/the-sendai-framework-is-five-years-old-are-we-on-track-to-meet-disaster-risk-reduction-targets/> (used on 4th July 2020)