Forum: Environment Committee
Issue: Developing proactive measures against the impact of natural catastrophes
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I. Introduction

A natural disaster could occur tomorrow, in a year, in a few decades, or this very minute. Currently, no technology that can prevent extreme natural catastrophes is in existence. The precise time that natural disasters occur cannot be changed, however the impact of natural disasters can be changed. Natural disasters, also known as natural catastrophes, have been a great threat to mankind for thousands of years. According to the World Bank, 97% of all human deaths in Less Economically Developed Countries (LEDCs) are caused by natural disasters. Infamously, in 2011, a series of earthquakes and tsunamis took the lives of approximately 14,000 people in Japan. It proved to be the largest and most destructive earthquake ever to hit Japan.

BERMUN XXV’s overarching topic focuses on eradicating human suffering on a global scale. Not only is the Environment Committee’s agenda for developing proactive measures to combat natural disasters a pressing and relevant task, it also ties straight back to the conference theme. Throughout history people have suffered from natural catastrophes, such as earthquakes and floods. Many of the areas most vulnerable also lack the adequate infrastructure and technology to counteract the fallout of these disasters.

Delegates of the Environmental Committee will need to find mitigation measures which will fundamentally eliminate and reduce the risk of natural catastrophes. Such measures include finding stable infrastructure, warning systems, mappings, insurance programs and many more solutions. Strengthening these measures is vital to ending human suffering and raising the standard of life around the world.

II. Definition of Key Terms

a) Disaster:

According to the World Health Organization a disaster is “a sudden ecological phenomenon of sufficient magnitude to require external assistance”. The term is also
known as a suddenly occurring event which causes severe damage, destruction, ecological disruption, suffering and loss of human lives.

b) Hazard

A hazard is an extreme event which can potentially threaten the environment, as well as the community. This term also includes severe forms of weather, such as tornadoes, storms and floods.

c) Disaster mitigation

Measures taken to detect, contain, and forestall events or circumstances which, if left unchecked, could result in a disaster. Disaster mitigation eliminates or reduces the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs.

d) Disaster risk reduction

The concept and approach to productively reduce disaster risks by systematically managing the damaging effects of natural hazards. According to the United Nations Office for Disaster Risk Reduction, the term includes effectively “minimizing the risks of natural catastrophes through reducing the exposure to hazards, lessening vulnerability of people and property, wise management of land and the environment, and improving preparedness for adverse events”.

e) Resilience

The ability, qualification and capability of a community exposed to natural catastrophes, to resist and to confront the effects of various of hazards. Fundamentally, the affected society were to be able recover from the impact of the catastrophe.

f) Vulnerability

The geographical location, or various other characteristics which makes a certain place susceptible to the effects and the impact of a natural catastrophe. The vulnerability of a
social group is determined by the quality of its economic, social, physical and environmental structures.

III. General Overview

a) Mitigating the effects of Natural Disasters

When combating natural disasters and developing measures to effectively end human suffering as a result of natural disasters, it is important to consider the numerous effects and impacts these catastrophes can have on the world. Natural disasters are not limited to the destruction of human life, but instead have long-lasting effects on any given society.

ii. Mitigating the effects of Tsunami’s

Tsunamis are without a doubt one of the worst natural disasters. They tremendously impact the environment. Their impact includes the contamination of both water and soil, leaving behind polluted drinking sources, and harming the health of the affected civilians. This includes the salinization of rivers, wells and numerous water bodies. Saltwater intrusion in drinking water sources becomes a big threat. Tsunamis extensively cause damage to infrastructure, including facilities such as sanitations systems, waste treatment centers, education centers and medical institutions. Moreover, another rare, yet prominent effect of tsunamis is the risk of radiation from nuclear plants. For example in Japan in 2011, the damage of nuclear power plants through natural hazards, such as tsunamis, can be utterly damaging; this could have numerous side effects. Civilians living in coastal regions, towns and villages have been struggling with escaping tsunamis. Sadly, many of the warning systems are not developed to the point of detecting a tsunami. As the water rushes toward land, it leaves a very short time gap for evacuation.

Tsunamis have been hard to predict, causing thousands of deaths. The occurrence of a tsunami, as well as any other form of natural disaster, cannot be prevented, however the effects can be mitigated. Looking specifically at tsunamis and their effects, early warning
systems are certainly the best measure and should be prioritized in communities. Moreover, physical resilience forms and tsunami proof construction, such as concrete walls, could surely be another measure against the impact of tsunamis.

Japan is an example of mitigation. It has constructed tall structures enabling vertical evacuation. Also, at least 43 percent of Japan’s coastline is lined with concrete seawalls, designed to protect communities close to the coast from high waves, floods, typhoons and tsunamis.

iii. Mitigating the effects of Earthquakes

Earthquakes are also a great threat to mankind and many of these effects must be taken into consideration when developing effective and proactive measures against the catastrophic impact of an earthquake. The energy released from an earthquake can be up to 10,000 times more than the first atomic bomb. Earthquakes can kill thousands of people and destroy settlements. Earthquakes can also have aftershocks, and they are hard to predict.

Earthquakes also trigger tsunamis, fires and landslides and each often destroys infrastructure. Tsunamis often occur after earthquakes due to the seismic shocks, which are sent through the water from the center of the earthquake. Earthquake also trigger landslides and various other ground subsidence. Avalanches, slumps and rock slides are all triggered by ground shaking. An example would be the April 2015 Nepal Earthquake. It triggered an avalanche on the Mt. Everest, killing 21 people and then it triggered an avalanche in the Langtang Valley, where more than 250 people were reported missing.

The severity of damage to manmade structures, such as bridges, dams and buildings varies from the intensity of the earthquake and from the quality of construction of the buildings. Much infrastructure is built out of masonry is brittle, and therefore more susceptible to damage and collapse. Structures made out of wood and steel have a lower chance of collapsing, since these building materials are extremely flexible. Seismologists believe, that earthquakes do not kill people, the buildings do. During that same earthquake in Nepal, a major aftershock shook the ground of Nepal. More than 200 people were killed and more than 2,500 people were injured.
Early warning systems are being developed, and possible could detect earthquakes. However, earthquake prediction is momentarily still inaccurate and it lacks the precision. Further measures to be taken and developed include warning systems, as well as proper medical aid after the occurrence of the earthquake. Keeping the effects of earthquakes in mind, it is certain that the most important measure to take is to construct stable buildings and infrastructure to prevent collapses. In many cases, collapsing buildings and facilities cause many human deaths. Building infrastructure with stable material, such as steel and wood, would be a significant step to prevent collapses. Increasing stability is a vital measure to be taken, however spreading awareness. People must be aware of what natural disasters they are likely to encounter. For instance, the media. The media has become much more prevalent in the past few years, making it ideal to spread awareness and information. Television, social media platforms and radios must be prepared to respond speedily and effectively to catastrophes. Early warning systems can alarm civilians through messages over phones and computers, which enables evacuation to a safer environment. As prominent as early warning systems are, education, a rather unexpected measure, is certainly to be considered. Educational materials about preparedness, warnings, and protection should be implemented into school curricula, in order for children to receive the information they need to protect themselves before, during and after the occurrence of an earthquake, as well as any other natural catastrophe. Indonesia has already adjusted its school curricula, which now includes classes concerning disaster risk reduction and preparedness.

**iv. Mitigating the effects of Floods**

Floods are natural events, which could occur suddenly and recede quickly. However, some floods take days or even months. This form of natural catastrophe could wipe out houses and even cities. Chemicals and other hazardous substances end up in the water and eventually contaminate and pollute water sources, such as wells, lakes and rivers. Besides contamination, floods kill and disturb many ecosystems; distorting the balance of the ecosystems. Floods can kill thousands of people, and the natural disaster destroy the houses, leaving the citizens helpless and homeless.
Flood control includes various measures against the impact of floods, which range from the construction of dams to coastal defences. Many dams are designed to aid in flood protection and control. Dams can control floods through capturing the water and gently and slowly releasing it—without a dam huge amounts of water would have created floods.

A preventative measure would include coastal defences, similar to the ones used against the impact of tsunamis. These defences include seawalls and beach nourishment. The most effective and elaborate flood defences, referred to as Delta Works, can be found in the Netherlands which were built after the flood of 1953, in the southwestern part of the Netherlands. These defences consist of dams, barriers, and sluices, which are movable gates allowing water to flow under it. Overall, Europe, specifically Belgium and the Netherlands, has been at the top of flood control technology, setting an example to many nations worldwide. Netherlands has the best flood control systems in the world, and they are continuously testing and developing new techniques to control natural hazards.

b) Geographical Distribution

Over the last decade, China, the United States, Indonesia, the Philippines and India constitute together the top five countries that are most frequently hit by natural disasters. In the year 2014, China faced the highest number of natural hazards of 17 floods and landslides, 15 storms, one drought, and 7 earthquakes. According to the International Disaster Database, each country is faced with different disaster challenges. The U.S. disasters have the highest common occurrence, with 735 instances between storms, floods and tropical cyclones, with severe storms being the most likely. In 2013 alone, 54 percent of disasters were classified as storms, amounting to a total of $12.46 billion in insured losses for the year. However, 85% of all natural disaster-related fatalities occur in Asia, according to the World Health Organization. The Philippines by virtue of its geographic circumstances is highly prone to natural disasters, such as earthquakes, volcanic eruptions, tropical cyclones and floods, making it one of the most disaster prone countries in the world. According to the Typhoon Warning Center annually, approximately 80 typhoons develop above tropical waters, of which 19 enter the Philippine region and six to nine make landfall. Moreover,
flooding in South and East Germany was the most costly natural hazard at the time with an estimated damage of 12.9 Billion dollars.

Arab cities, with a high populations, are vulnerable to multiple of hazards, such as floods, earthquakes, and sandstorms. “The region’s environment and wealth are increasingly concentrated in a small number of highly vulnerable cities and many such communities are at risk from multiple hazards,” said Djillali Benouar, director of the Built Environment Research Laboratory at the University of Science and Technology Houari Boumediene in Algeria. Natural disasters have a great impact on less developed countries since poverty rates are high, weak preparedness policies also affect disaster recovery and fatality statistics.

c) Climate Change

Nearly all scientists believe climate change will increase the occurrence of natural disasters. Climate change may not be the sole reason for the recent natural disasters, but it will certainly play an influential factor in the future. According to the Intergovernmental Panel on Climate Change, an increase of greenhouse gases in the atmosphere will probably boost temperatures over most land surfaces, though the exact change will vary regionally. Global warming, and generally an increase of temperature can increase the risk of droughts, and possibly more severe and intense storms. Global warming may “cause the temperature difference between the poles and the equator to decrease, and as the difference decreases, so should the number of storms”, says George Tselioudis, a research scientist at NASA Goddard Institute for Space Studies and at Columbia University. However, even though the warming climate decreases the amount of natural catastrophes, it could certainly increase the severity and extremity of such hazards. Climate change will affect the intensity of storms and various other catastrophes. A national geographic report shows, that “Climate change made the heat waves of 2014 substantially more likely and severe, according to the report. Extremely high pressure south of Australia, causing frost, low-elevation snowfall and less rain, also was more likely, as was an extreme, five-day rainfall in New Zealand”. Worldwide scientists are seeking new evidence, proving that global warming has a tremendous influence on natural disasters.
d) Case Study: Great East Japan Earthquake 2011

On March 11, 2011 a magnitude-9 earthquake shook the ground of northeastern Japan, triggering a deadly tsunami. Known as the Great East Japan Earthquake. The catastrophe is the fourth deadliest, recorded earthquake. According to Japan's National Police Agency “the number of confirmed deaths is 15,891 as of April 10, 2015. Most people died by drowning”. "For big earthquakes, the tsunami is going to be the big destructive factor," said Vasily Titov, director of the National Oceanic and Atmospheric Administration's Center for Tsunami Research in Seattle, Washington. "But if the nation is prepared, warning and education definitely saves lives”. Even though thousands of lives were lost, the early warning system in Japan’s capital, Tokyo, enabled many to flee and evacuate. Tokyo’s residents were alarmed by a warning before the strong earthquake shook Japan. Additionally, Japan stopped many high-speed trains and factory assembly lines. Citizens received text messages and alerts on phones, warning of strong earthquakes and a possible tsunami threat. After the catastrophe, Northeastern Japan was wiped out. On June 25th 2011 a national recovery plan was published. This recovery plan proposed large societal changes to improve tsunami preparedness and relocating a city to a safer, less vulnerable area.

Japan is considered one of the best countries with the best preparations for natural disasters. Each schoolchild in Japan is familiar with earthquake drills and procedures. Skyscrapers in Tokyo are made earthquake-proof with the aid of deep foundation and massive shock absorbers that reduce seismic energy. Yet the conflict arises as developed cities, such as Tokyo, have the technology, infrastructure and education to effectively reduce the impact of Natural disasters. On the other side, many of the less developed areas are not given this advantage and suffer from natural catastrophes, due to the lack of preventative measures against hazards.

IV. Major Parties Involved and their Views

a) United Nations Office for Disaster Risk Reduction (UNISDR)

According to the UNISDR their vision is “to enable all communities to become resilient to the effects of natural, technological and environmental hazards, reducing the compound
risks they pose to social and economic vulnerabilities within modern societies" and to "proceed from protection against hazards to the management of risk through the integration of risk prevention into sustainable development". Disaster risk reduction includes the systematic approach, which involves decisive planning, to develop proactive measures against the impact of natural disasters, as well to combat the severity and intensity of such catastrophes. Examples of risk reduction include lessening vulnerability of people and property, reducing exposure to hazards, and improving preparedness. The United Nations Office for Disaster Risk Reduction aims to reduce the damage and loss of human lives caused by natural hazards, which range from hurricanes to droughts. The UNISDR has numerous regional offices in all parts of the world, including offices in Africa, Asia and the Pacific.

b) United Nations Development Programme (UNDP)

The United Nations Development Programme works in over 170 countries and territories, where the programme helps develop policies, leadership skills, and build resilience in order to sustain sustainable development results. One of their best abilities according to the programme are “to act quickly also allows us to establish an entry-point for our early recovery and long-term resilience-building efforts”. The UNDP is important to governments and smaller organizations. In a time where the vulnerability of countries and the chance of natural disasters is increasing, the UNDP remains a reliable partner developing advanced building measures and supporting affected nations and areas. The programme desperately needed to offer aid and long term recovery plans after the earthquake in 2015 in Nepal. In the end, this programme achieved three main goals: remove debris to continue rescue activities and allow the access for humanitarian services. Additionally, they supported the restoration of roads and essential services in remote areas. Lastly, the UNDP encouraged the development of safe infrastructure, including providing uninterrupted communication services.

V. Timeline of Events
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<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>June 3-14, 1992</td>
<td>United Nations Conference on Environment &amp; development in Rio de Janeiro, Brazil (Agenda 21)</td>
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<tr>
<td>January, 2005</td>
<td>Hyogo framework for Action (HFA) established</td>
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<td>August 29, 2005</td>
<td>Hurricane Katrina, a category 4 storm hits the coast of the United States</td>
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<tr>
<td>Jan 13, 2010</td>
<td>Haitian Prime Minister estimates 100,000 deaths caused by the 7.0 magnitude earthquake in Haiti</td>
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<tr>
<td>March 11, 2011</td>
<td>The Great East Japan Earthquake</td>
</tr>
<tr>
<td>May 14-18, 2015</td>
<td>UN World Conference on Disaster Risk Reduction in Sendai, Japan (Sendai Framework)</td>
</tr>
<tr>
<td>November 30 - December 11, 2015</td>
<td>Paris Climate Conference (COP21)</td>
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**VI. Previous Attempts to Solve the Issue**

The Hyogo Framework for Action (HFA) consists of a 10 year plan (2005-2015) to effectively reduce the impact of natural catastrophes and to make the world safe from natural hazards. The expected outcome of the 10 year plan reads to reduce the number of “disaster losses, in lives and in the social, economic and environmental assets of
communities and countries”. With the mentioned goal, the HFA wanted to improve and strengthen institutions, mechanisms, and the capacities to reduce the impact of natural disasters. Additionally, the plan aimed to integrate disaster risk reduction into sustainable development policies and planning. Their third goal was to incorporate a series of systematic risk reduction approaches into recovery and response programmes. The HFA has numerous case studies, one of which calls for safer schools and new disaster prevention education. In Sendai City, Japan where earthquakes occur regularly, it was a priority to ensure safe school environments. The HFA made schools more earthquake resistant and spread disaster prevention knowledge throughout primary and secondary schools.

Similarly The Paris Climate Conference (COP21) plays an important role when reducing the impact of natural disasters. From the 30th of November to the 11th of December, 196 parties gathered in Paris to find solutions to effectively combat climate change. By working with affected people to understand the vulnerabilities, policymakers can plan to mitigate the disastrous impacts of hazards such as floods, storms and earthquakes. The COP21 promotes resilience and encourages individuals to take a lead on disaster risk reduction and disaster risk assessment. The development of awareness programs and services, such as warning signs, are the first steps towards a safer world. One of the goals for the Paris Climate Conference is to “strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries”.

VII. Relevant United Nations Documents & Other Sources

a) UN Documents

- **International Strategy for Disaster Reduction** 22 December 2015 (A/RES/70/204)

This resolution adopted by the General Assembly on the 22nd of December, focuses on international strategies for Disaster reduction. This constructive resolution targets different strategies and it stresses the implementation of multiple measures, including educational, health, cultural and environmental measures, which would ultimately prevent hazard exposure.
b) Other Sources

- Climate and Disaster resilience recovery challenges and lessons
  This document released by the United Nations Development Programme focuses purely on the challenges an individual and nations could face when seeking measures against the impact of natural disasters. This publication sheds light on the growing impact of hazards, such as earthquakes on humanity, including communities and economies. By doing so, this document highlights the importance of finding solutions in order to end human suffering from catastrophes, yet it also reveals that finding proactive measures does not only mean building safer and more stable infrastructure.

VIII. Questions to Consider

1. Is your nation specifically vulnerable to national disasters, such as earthquakes and tsunamis? Is the area prone to these disastrous hazards?

2. Even though reconstruction plays a major role when finding measures against the impact of natural disasters, what other certain measures are there?

3. Does your nation have ready access to medical attention and aid?

4. What long term plans can be implemented to reduce the loss of human lives and to prevent further human suffering?

5. What have the various organizations and programmes, such as the United Nations Development Programme, implemented in your nation? Have these plans and strategies become effective in any way?
6. Which forms and types of natural catastrophes have taken place in your nation? Which measures has your nation taken in order to prevent the severe impact of these disasters?

IX. Possible Solutions

Natural disasters have been a tremendous threat to mankind. Developing proactive and effective measures against the disastrous impacts of natural hazards is vital in the 21st century to end human suffering. Delegates have to look at finding proactive measures against the impact of the different natural disasters in various ways. Delegates should consider educational measures, such as teaching safety procedures and implementing warning drills in school facilities, stabilizing and securing infrastructure, and ultimately planning ahead of time. Organizing warning systems and evacuation routes and drills should also be considered and implemented. An additional concern is to prepare adequate medical aid and support after the hazard has occurred to reduce the risks of further casualties. Technology and media alerts remain an effective way of spreading awareness of the dangers of such natural hazards.

X. Conclusion

In many cases, hundreds and hundreds of people, including children, suffer from natural hazards. Humanity can not stop natural disasters from occurring, nor their severity and extremity, yet we can certainly influence the impact these hazards have on our world.

The effects vary between disasters, which makes it so important to look so closely at the different effects and impact these various natural hazards can bring. With climate change and global warming become more and more evident, the risks of even more severe and extreme weather becomes greater. Delegates, even if fully preventing natural disasters is impossible, much can be done to build capacities to reduce the severity of the impact. A key to doing so, is looking at disaster risk reduction, mitigation, preparedness and resilience.

“Ending Human Suffering”- this year’s theme directly targets the Environment Committee. Generally, more than 450 Million people suffer from natural catastrophes; and
this number is rapidly increasing. Delegates of the Environment committee, use this time to seek out different measures to tackle this prominent issue before more people start suffering from these disastrous catastrophes. This is, after all, the calm before the storm.

**XI. Bibliography**


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[https://www.unisdr.org/archive/12159].

