

Committee: (UNEA)

Agenda: (Implementing measures to alleviate the rise in sea level for countries or islands in danger of floods or other natural disasters)

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Introduction

The term "**sea level rise**" refers to the rise in ocean levels brought on by global warming. Because it releases carbon dioxide and other heat-trapping gasses into the atmosphere, burning fossil fuels is one of the factors contributing to global warming. The majority of this heat is then absorbed by the oceans. Water expands when it becomes warmer. Globally, this causes ocean levels to rise.

Glaciers and ice sheets that are located on land are also significantly impacted by global warming. These ice reserves can be found in regions such as Greenland and Antarctica. They normally melt in the warmer months of the year, and the ice is refilled in the winter. But ice caps and glaciers are melting disproportionately quickly as a result of rising average global temperatures throughout the year.

Global coastal life is being threatened by sea level rise. Increased storm surge intensity, flooding, and damage to coastal areas are some of the consequences. This is frequently the location of both vulnerable wildlife habitats and sizable population centers. As a result, some might be forced to relocate and look for safer housing. Rising oceans have the potential to poison soil and groundwater with salt, endangering even life further inland. It's hard to forecast how high sea levels will climb. Coastal areas must be ready for the consequences, thus it is a problem that needs to be closely watched.

In this conference, the delegates are to discuss specifically the correlations between natural disasters such as floods or tsunamis, typhoons, and rise in sea level.

Definition of Key Terms

Sea level rise

increase in the average reach of the ocean. The current sea level rise is 3.4 millimeters (0.13 inches)

Carbon dioxide

greenhouse gas produced by animals during respiration and used by plants during photosynthesis. Carbon dioxide is also the byproduct of burning fossil fuels.

Glacier

mass of ice that moves slowly over land

Fossil fuel

coal, oil, or natural gas. Fossil fuels formed from the remains of ancient plants and animals

Global warming

increase in the average temperature of the Earth's air and oceans.

Ice cap

area of fewer than 50,000 square kilometers (19,000 square miles) covered by ice

Ice sheet

A thick layer of glacial ice covers a large area of land

Atmosphere

A mixture of gasses that surrounds the Earth

History

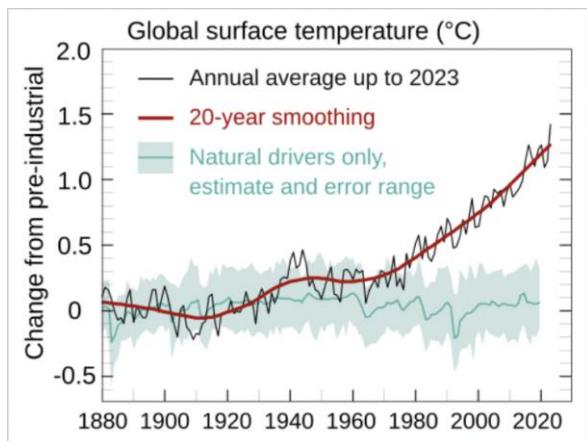
Climate change***Origin of the climate change***

At the beginning of the 19th century, scientists discovered that the changes in Earth's temperature could not be explained by solar energy alone. Humans learned that the atmosphere contains some of the heat that is radiated from the surface of the indicator. In 1856, Eunice Newton Foote stated that air, including carbon dioxide, was larger than the solar thermal effect. Since then, John E. Tilton has been talking about the greenhouse effect. At the time, our humanity was more dependent on coal than it is now, which led to more carbon dioxide emissions. Those who heard the warning news at the time didn't believe it, but they checked the various newspapers and it turned out to be a fact; this is a time when the global temperature was changing.

Global warming

The global average temperature of Earth has risen by around 1 degree Celsius (1.8 degrees Fahrenheit) from the pre-industrial era due to human activity; this value is currently rising by

more than 0.2 degrees Celsius (0.36 degrees Fahrenheit) every decade. Since the 1950s, human activity has unquestionably contributed to the current warming trend, which is happening at a rate never seen in millennia. "The era of global warming has ended; the era of global boiling has arrived," United Nations Secretary-General António Guterres declared in a news briefing, as scientists confirmed that July of 2023 is set to become Earth's hottest month on record. All scientists agree that longer and hotter heat waves, more frequent droughts, heavier rainfall, and stronger hurricanes are being caused by the planet's rising temperatures. Additionally, as the Earth's ocean temperatures rise, tropical storms have the capacity to absorb more energy. Stated differently, a category 3 hurricane has the potential to become a more dangerous category 4 storm due to global warming. In reality, since the early 1980s, experts have observed an increase in both the frequency and the quantity of storms that reach classifications 4 and 5. Thirty tropical storms, six major hurricanes, and thirteen hurricanes in all made up the record-breaking 2020 Atlantic hurricane season.



Caption #1: Earth's average surface air temperature has increased almost 1.5 °C (about 2.5 °F) since the Industrial Revolution.

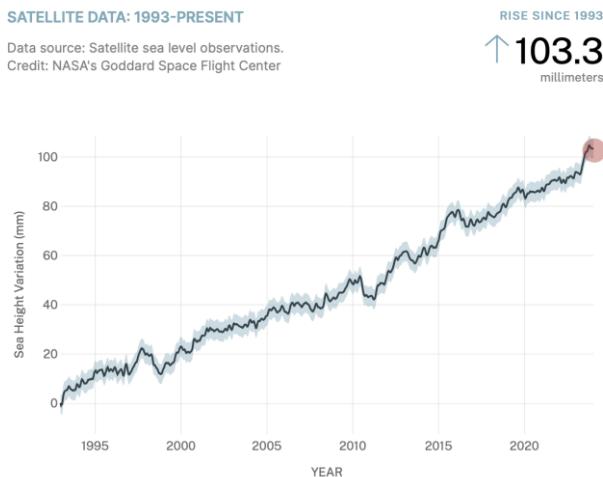
Sea level rise

Origin of the sea level rise

Since 1880, the average sea level has increased by roughly 8 to 9 inches (21 to 24 centimeters). The combination of seawater's thermal expansion as it heats and the melting of ice sheets and glaciers is mostly to blame for the rising water level. Global mean sea level reached its highest yearly average in the satellite record in 2022, rising 101.2 millimeters (4 inches) above 1993 levels (1993-present).

More sea level rise discoveries

Two main causes led to the rise in sea level. First, glaciers and ice sheets all around the planet are melting, adding water to the ocean. Second, the ocean's volume is increasing as the water warms. A third, much smaller, factor to sea level rise is a decrease in the amount of liquid water on land (aquifers, lakes and reservoirs, rivers, and soil moisture). People's depletion of groundwater is largely responsible for the movement of liquid water from land to ocean. Around the previous ten years, melting and heat expansion have been about equal contributors to the observed rise in sea level since the 1970s. Nonetheless, there has been a faster pace of ice sheet and mountain glacier melting. Over the past few decades, the decadal average loss from glaciers in the reference network of the World Glacier Monitoring Service has quintupled. In the 1980s, the equivalent of 6.7 inches (171 millimeters) of liquid water was lost; in the 1990s, it was 18 inches (460 millimeters); in the 2000s, it was 20 inches (-500 millimeters); and in 2010–2018, it was 33 inches (850 millimeters). Between 2012 and 2016, the amount of ice lost from the Greenland Ice Sheet increased seven times, from 34 billion tons annually between 1992 and 2001 to 247 billion tons annually.



Caption #2: NASA has released data showing how much the sea level has risen every year for about 30 years from 1993 to 2022.

Key Issues

Major harms brought by sea level rise

Sea levels are rising as a result of multiple causes, chief among them being global warming, which causes seawater to expand when ice sheets and glaciers melt and warm up. Sea level rise has a variety of negative effects that can seriously affect coastal communities and other locations.

Coastal erosion

Beaches, cliffs, and coasts deteriorate due to coastal erosion, which is accelerated by rising sea levels. Such erosion can result in the loss of priceless land, harm to coastal infrastructures, and extinction of natural ecosystems.

Increased flooding

Coastal locations are more susceptible to flooding when sea level rises, particularly during stormy weather and rainy spells. Lowlands are more vulnerable to floods, which can cause property damage, community uprooting, and financial losses. This includes cities and densely populated coastal areas.

Seawater invasion

As the sea level rises, aquifers and rivers may become infiltrated by seawater. Such incursions have the potential to destroy agricultural land, contaminate drinking water supplies, and harm delicate ecosystems that depend on freshwater.

Impact on base facilities

Increasing sea levels pose a threat to coast-based infrastructures, such as bridges, highways, airports, ports, and power-plants etc. Elevated floods and erosion have the potential to harm or destroy these infrastructures, as well as cause disturbances to transportation, energy supply, and business operations.

Migration within communities

Coastal communities, specifically those in low-lying and endangered locations are seriously at risk by sea level rise. Humans may be forced to migrate when floods and erosion worsen, which might cause social chaos, economic hardship, the loss of cultural heritage, and challenges in providing suitable housing and support for refugees.

Economic repercussions

The harm brought about by sea level rise has a big financial influence. Coastal businesses, which include tourism, fishing, and agriculture, may have challenges as a result of diminished land availability, infrastructural degradation, and heightened susceptibility to extreme weather events. Moreover, putting in place safeguards and constructing barriers might be expensive ways to adjust to sea level rise.

Ecological impacts

Coastal ecosystems such as mangroves, salt marshes, and coral reefs are important habitats that provide numerous benefits, including storm protection, carbon storage, and marine biological nurseries. Rising sea levels endanger these ecosystems through flooding and narrowing, which can have widespread ecological consequences.



Caption #1: Increased flooding due to the sea level rise

The association between natural disasters such as floods, storms, tsunamis, and rising sea levels

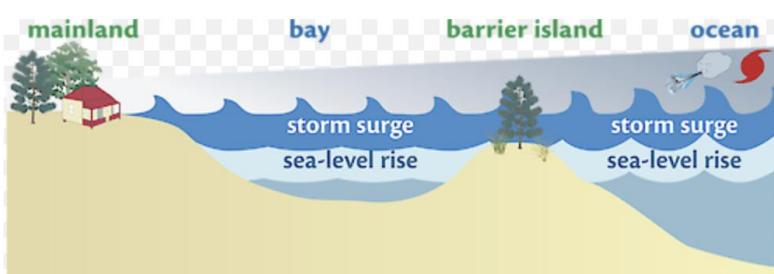
A portion of the land in coastal locations tends to erode as sea levels rise. This can enhance the risk of flooding in coastal areas by drawing coasts closer together. Local flooding risk may grow due to rising sea levels. Sea level rise facilitates river penetration of the coast, particularly in the event of river descent, potentially increasing the flood's depth and size.

Storms and sea level rise

The wind forces the water surface upward during a storm, raising the sea level. This phenomenon, referred to as a storm surge, can seriously harm property, especially in low-lying locations. The effects of storms or storm related activities may intensify as sea level rises.

Sea level rise and tsunamis

Tsunamis are caused by earthquakes, subduction zones, or volcanic eruptions, and their effects can be amplified by rising sea levels. Rising sea levels may also change water levels and tsunami excavations in places hit by tsunamis.



Caption #2: Cause of tsunamis due to the rise in sea level

Major Parties Involved and Their Views

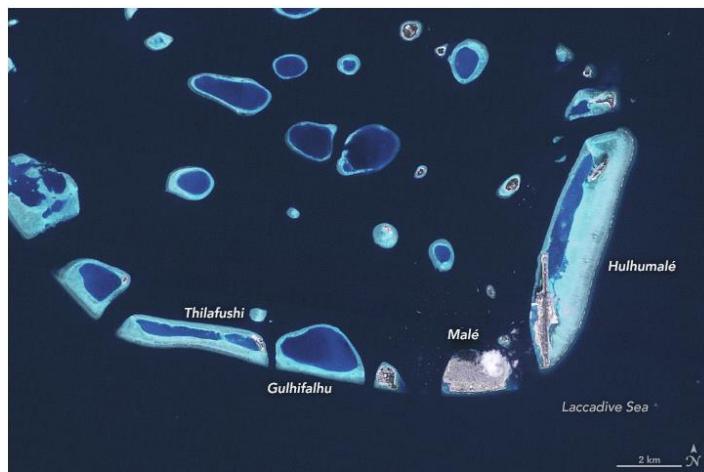
Maldives***Geographical dilemma/problem***

The Maldives has the lowest terrain of any nation in the world, with almost 80% of its 1,190 coral islands situated less than one meter above sea level. Because of this, the Indian Ocean archipelago is especially susceptible to sea level rise.

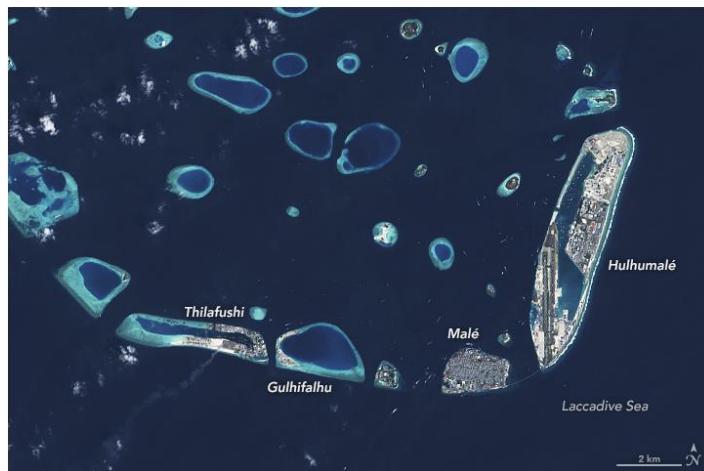
Their views

As a safeguard against sea level rise, the Maldives government has looked at proposals to buy land on higher ground in neighboring nations, but planners are also trying to make the nation's present islands more resilient. Hulhumalé, a recently built artificial island northeast of the city of Malé, is one example.

Around twice as high as Malé, Hulhumalé is a new island created by pumping sand from the seafloor onto a submerged coral platform. It rises to a height of around 2 meters above sea level. The island's increased height may serve as a haven for Maldivians who may someday be forced from lower-lying islands by rising sea levels. It might also be a viable solution for storm surges and typhoon evacuations in the future.



February 3, 1997

[Download JPEG](#)

February 19, 2020

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Caption #1: The pair of Landsat satellite images above showing how much the area has changed between 1997 and 2020.

The Netherlands

Geographical dilemma/problem

Despite having highly developed infrastructure and coastal defenses, no area in Europe is more vulnerable than the Netherlands on the continent's edge. Much of the country lies below sea level and is steadily sinking. Climate change now raises the possibility of rising waves and more powerful storms.

Their views

"If we do not reduce greenhouse gas emissions, the sea level off the Dutch coast could rise

by 1.2 metres around 2100 compared to the beginning of this century."

But the Dutch have solutions for rising seas. Climate change is not viewed as a hypothetical or an economic drag in the soggy Netherlands. Instead, it represents an opportunity. They chose 'Climate adaptation'.

The Netherlands can protect itself with taller dikes and larger pumping stations, a gigantic dam in the North Sea, or by shifting with the water. (NOS Reports) They collaborated with consulting firms, scientists, governments, and social organizations to develop the three paths the country may take.

The first choice is to "protect" by continuing with the current technique for as long as possible. Make the dikes taller and wider, and the polders deeper.

"Seaward" is a large dam with an edge lake off the Dutch coast. The rivers will enter this dam before pouring into the sea. This will happen under their control at first, but strong pumping stations will be required in the long run.

The Maeslant storm surge barrier on the Nieuwe Waterweg in South Holland was a huge success. It is intended to respond to water level predictions generated by a centralized computer system. When Rotterdam is at risk of flooding, the barrier automatically closes to safeguard 1.5 million residents. The gates close if the water is predicted to reach three meters or more.

The final option is to "move along" with the water. "Think of elevated or floating housing, salt-tolerating agriculture, and a shift of investments to the upper Netherlands," according to the findings. The disadvantage is giving up land, but the method is scalable in the long run. For example, they build floating solar farms. This ingenious farm in the Netherlands is a circular island of solar panels floating on top of water, creating sustainable energy. It is not only resistant to sea level rise, but also a significant energy saver.



Caption #2: The Maeslant storm surge barrier in The Netherlands

Timeline of Relevant Resolutions, Treaties and Events

Date	Description of event
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June 3~14, 1992	UNFCCC Rio Earth Summit
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December 11, 1997	The Kyoto Protocol
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December 12, 2015	The Paris Agreement
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Evaluation of Previous Attempts to Resolve the Issue

The United Nations (UN) has been actively put an effort to alleviate climate change including sea

level rise. Major attempt to resolve the issue was The Paris Agreement. It was adopted in 2015, is a landmark international treaty that aims to limit global warming to well below 2 degrees Celsius above pre-industrial levels, with efforts to limit the temperature increase to 1.5 degrees Celsius. By addressing the root causes of climate change, the agreement indirectly aims to mitigate sea level rise. Countries submit their climate action plans outlining how they will reduce emissions and adapt to climate impacts. The UN emphasizes on enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change and developed countries commit to mobilizing financial resources to support developing countries in their mitigation and adaptation efforts.

The UN General Assembly has convened high-level meetings to address the existential threats posed by sea level rise. These meetings focus on preserving states' rights under international law and ensuring the sovereignty and statehood of affected nations are not compromised by rising seas .

Discussions have emphasized the need for legal stability for countries whose economies depend heavily on maritime zones. This includes safeguarding the cultural heritage of small island developing states and increasing climate financing for vulnerable communities .

The UN Secretary-General, António Guterres, highlighted the urgency of radical climate action in the latest State of the Global Climate report. He called for accelerated efforts to transition away from fossil fuels, strengthen national climate plans, and provide financial support for climate adaptation in developing countries .

As a result, The Paris Agreement has successfully brought almost every country in the world together in a historic international accord, significantly raising global awareness about the issue of climate change. Many countries have submitted voluntary Nationally Determined Contributions (NDCs) and are formulating policies to implement these commitments. Many coastal communities have become more resilient due to improved infrastructure, early warning systems, and better planning and zoning regulations. Climate adaptation measures have increasingly been integrated into national development plans and policies. Enhanced cooperation and knowledge sharing among countries and organizations, leading to more effective and coordinated responses to sea level rise.

Adaptation strategies are being reinforced, including the construction of coastal defense infrastructure and measures to prepare for sea level rise and prevent flooding. For instance, the Netherlands has developed advanced coastal defense systems to respond to sea level rise.

Despite efforts, there remains a significant gap in the funding needed for comprehensive adaptation measures. Some countries, particularly low-lying island nations and less developed regions, struggle with the implementation of adaptation measures due to limited resources and technical expertise. Global carbon emissions are still high, and continued warming poses a long-term threat of accelerated sea level rise.

Many countries are failing to meet their greenhouse gas emission reduction targets. Some nations have not set any targets or are reluctant to implement necessary measures. Global greenhouse gas emissions remain high, insufficient to slow down the pace of climate change.

The frequency and intensity of extreme weather events (floods, droughts, heatwaves) are increasing, causing significant damage, especially in vulnerable countries and regions. Low-lying countries like Bangladesh are experiencing repeated economic and human losses due to floods and storms.

Climate change is displacing more people, leading to the emergence of environmental refugees. There is a lack of clear international legal status and protection for these individuals, necessitating a solution. Countries like Tuvalu and Kiribati face situations where residents are forced to relocate due to rising sea levels.

Developing countries particularly lack funds to adapt to climate change and reduce greenhouse gas emissions. Although international financial support is needed, promised funds are often insufficient or not delivered on time.

In conclusion, international efforts to address climate change and sea level rise have yielded some positive outcomes, but significant challenges remain. Ongoing global cooperation, strengthened policies, and financial support are essential. All countries must actively participate in combating climate change.

Possible Solutions

There is no way to keep sea levels from increasing, as some rise is unavoidable owing to previous emissions. As a result, preparations for coastal disasters can be roughly divided into two categories: exploiting natural functions and performing physical interventions.

One effective way is to draft a resolution to build green infrastructure. Green infrastructure uses natural features like salt marshes, sandy beaches, seagrass beds, and dunes (sand hills generated by shifting sand) to help alleviate coastal disasters. Even during coastal floods, green infrastructure serves as a buffer, minimizing impact to residents.

Another strategy is to impose restrictions on residential development near beaches. Constructing homes or buildings with raised heights is a typical practice. Homes are elevated above floodwaters by elevating building heights. Some countries also acquire and control coastal properties to avoid rapid private development.

Countries such as the United States and France are acquiring property and homes in hazard-prone coastal areas through local governments. Since the 1970s, the French government has actively bought vulnerable coastal lands to avoid reckless private growth.

Finally, planning for migration is critical. When sea levels rise, residents in susceptible places should be relocated to safer sites ahead of time. It also entails developing fast evacuation instructions for instant use during emergencies.

These various techniques highlight the significance of taking proactive efforts to improve coastal resilience to sea level rise and lessen its negative effects on communities.

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