RISING SEAS AND RISING RISKS

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CAUSES OF SEA LEVEL RISE

- Global warming is melting ice caps and ice bergs which causes a rise in the sea level.
- Thermal expansion of water due to global warming.
- Sea Level Rise is a climate-induced and human-driven phenomenon.
VISIBLE CONCERNS OF SEA LEVEL RISE

- Melting Glaciers
- Loss of Greenland and Antarctica’s ice sheets
SEAL LEVEL RISE: FACTSHEET

- Average sea levels have swelled over 8 inches since 1880. (National Geographic)
- There was a rise in the sea level by 3 inches over the past 25 years. (National Geographic)
- Every year, the sea rises another 1.3 inches. (National Geographic)
- Scientists predict that major breakup of the Greenland and West Antarctic ice sheets can easily raise it up to 276 inches, creating a doomsday scenario.
According to NASA, there has been a sea level change of over 7.87 inches.
The sea level rise can be more than approximately 157 inches in the worst possible case. (US Environment)

The new IPCC projects global mean sea level is rising, with acceleration in recent decades due to increasing rates of ice loss from the Greenland and Antarctic ice sheets.

Without cuts in carbon emissions, the ocean is expected to rise between 24 inches and 43.3 inches, about 3.93 inches more than the earlier estimate. (The Guardian)
Ocean heating is expected to increase by at least 20 times by 2100. (The Guardian)

Across the ocean, heat, acidification and lower oxygen is set to cut fisheries by a quarter and all marine life by 15% if emissions are not slashed. (The Guardian)

The Arctic Sea ice in 2019 shrank to its second lowest extent in the 41-year satellite record. (National Oceanic and Atmospheric Administration)
The impact of sea level rise will cause several trillion dollars of damage per year.

It will cause mass migration of millions.

A rise in sea level by 3.93 inches will expose 10 million people to flooding. (The Guardian)

Low-lying regions around the world will suffer the most, as countries like Bangladesh, East Timor, Maldives, Sri Lanka, U.S., will face either partial or complete inundation.

Opening up of new Arctic Routes
IMPACTS OF SEA LEVEL RISE-FOOD AND WATER SECURITY

- Food security will be hampered to a great extent due to loss of agricultural land.
- Quality of the remaining agricultural land will degrade due to increased salinity.
- Case of Mekong and Red River
- Hyper-salination and water security
- Excessive pumping of ground water might insert unwanted chemicals like arsenic in absence of drinkable water.
Energy infrastructures are highly vulnerable to the sea-level rise.

Increased water level will affect the functionality of the nuclear reactors built along coastal regions.

The Fukushima case

Sea-level rise can contaminate water used for drinking and irrigation.

It can also threaten coastal plant and animal life.
Recent expert analysis concluded that 93 inches of sea level rise remains possible by 2100. (The Guardian)

Sea level is expected to rise by a huge magnitude of 157 inches by 2300. (The Intergovernmental Panel on Climate Change)

Damage will be done to many coastal ecosystem including deltas, port facilities, coastal structures, coral atolls and reefs.

Threat to Marine Life

Flooding of many densely populated areas.

Up to 216 million people currently live on land that will be below sea level or regular flood levels by 2100. (Mother Nature)
IMPACTS OF SEA LEVEL RISE-METROPOLITAN SCENARIO

- Around 1.9 billion people and over half of the world’s megacities are all in grave danger if we don’t act immediately. (The Guardian)

- Eight of ten financial cities are located at costal regions and the inundation of these cities could lead to an economic and insurance collapse. (Intergovernmental Panel on Climate Change)

- There can be drainage problems due to a rise in sea level.

- Global flood damage for large coastal cities could cost $1 trillion a year if cities don't take steps to adapt. (World Bank)
As more and more water breaks upon the shore, beaches and other areas will be slowly eroded.

The sand and other barriers are often our first line of defense against the erosion caused by bodies of water, which are not effective.

With sea levels rising, it’s very likely these precious and delicate environments will be washed away.
POLITICO-ECONOMIC IMPACT

- Loss of Tourism Economy
- Threat to Existing Ports and Supply Chain Management
- Politico-Social Destabilisation
- Loss to Private Sector Investment
THREAT TO PACIFIC ISLANDS

- Recently at least five reef islands in the remote Solomon Islands have been lost completely to sea-level rise. (ZME Science)
- Nuatambu Island has lost more than half of its habitable area, with 11 houses washed into the sea since 2011. (ZME Science)
- Natural variations and geological movements will be superimposed on these higher rates of global average sea level rise.
- 21 islands exposed to higher wave energy, five completely disappeared and a further six islands eroded substantially. (Third World Network)
Many coastal cities are planning adaptation measures to cope with long term prospects of higher sea levels.

Building seawalls, rethinking roads, and planting mangroves or other vegetation to absorb water are all being undertaken.

In Jakarta, a USD 40 billion project will aim to protect the city with 80 feet (960 inches) high seawall.
ADAPTING TO THE THREAT

- Rotterdam has built barriers and innovative architectural factors such as “water square” with temporary ponds.
- Rotterdam, home to the Global Center on Adaptation, has offered a model to other cities seeking to combat flooding and land loss.
ADAPTING TO THE THREAT

- In Miami, it is common for sidewalks and even personal driveways to be raised by adding several feet of concrete to them.
- California introduced its first policy guide for sea level rise in 2015, which includes rebuilding and replenishing the natural beaches, dunes, wetlands, and other areas.
THE FUTURE

- Latest report from Intergovernmental Panel on Climate Change states the oceans can rise between 10 and 30 inches by 2100.

- NASA and European data predicts a rise of 26 inches by the end of this century if the current trajectory continues.

- If all the ice on Earth in glaciers and sheets melts, it would raise sea level by 2,592 inches. (National Geographic)

- Some countries and even states can disappear under the waves. Example: Florida and Papua New Guinea.
Reversing completely the process of sea-level rise is not achievable.

Some of the impacts of rising water level are inevitable.

Practical course of actions will be to mitigate the impacts of the sea level rise and preventing future aggravation.
Conclusion
THANK YOU

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