

Forum: Environment Commission

Issue: Protecting and restoring freshwater and marine ecosystems to sustain their services for generations to come

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Introduction

Water is the lifeblood for all living ecosystems, as well as an essential need for any kind of social and economic development. This is why Sustainable Development Goal 6 clean water for all is a core SDG which connects to all the other SDGs, and sustaining our ecosystems is a burden incumbent on all persons at all levels and walks of life .

Climate change is enacting devastating effects on our world today. With the rise in population, pollution and global temperatures, marine and freshwater ecosystems run an immense risk of being destroyed. These factors along with others (such as coastal development) have led to more than 80 percent of oyster reefs to have been lost globally. The vital resource of freshwater is threatened by human activities.

Pollution in oceans, lakes and rivers is only increasing. According to the United Nations Development Programme (UNDP), fertilizer runoff and 10 to 20 million tonnes of plastic waste enter the oceans each year and destroy biodiversity and ecosystems. The consistent dumping of toxic substances into freshwater has caused birth defects and diseases in amphibians and cancer in humans. In order to ensure an environmentally friendly and safe future, it is imperative for all governments to introduce productive measures for the prevention of this problem.

However, it is difficult to organize solutions; most countries are not on track to accomplish climate related goals set by the UN. In addition to this, the Sustainable Development Goals (SDGs) related to the ocean must be achieved by 2020 instead of 2030 if we are to save the seas – this has been confirmed by the UNDP.

The consequences of human activities will be irreversible if measures to protect ecosystems are not taken immediately. By delaying the implementation of solutions and not recognizing the severity of the issue, we are inhibiting medical advancements and the development of nations. Furthermore,

according to the UNDP, if the rate at which oceans are currently being polluted continues, by the year 2050, oceans could contain more plastic than fish when measured by weight. Therefore, it is necessary for all governments to create innovative solutions and effective policies to protect the environment for a more prosperous future.

Definition of Key Terms

Ecosystem services



Ecosystem services are the direct and indirect benefits that humans obtain from biodiversity. These services include obvious advantages like food, freshwater and medicines but also more unknown ones including water purification, climate regulation and waste management. Some scientific research and development can also be seen as ecosystem services.

Marine ecosystems

An ecosystem which occurs in or near salt water (oceans and seas), is referred to as a marine ecosystems. Over 70 percent of the Earth is made up of oceans so these ecosystems make up a large part of the planet. This also means that we rely heavily on them in different ways. Different types of marine ecosystems include: salt marshes, coral reefs, mangroves, deep sea and coastal wetlands. The services marine ecosystem provide are vital; some examples are: flood control, erosion control and carbon sequestration.

Freshwater ecosystems

Freshwater ecosystems occur in freshwater source. Habitats provided by freshwater ecosystems consist of lakes, rivers, streams, springs, ponds and wetlands. They are a precious resource and are home to aquatic plants, fish, reptiles, birds and mammals. These ecosystems provide major

services such as: fish production, water supply, nutrient transport and health and recreational benefits. Out of the planet's water supply only 3 percent is freshwater.

Ocean acidification

When carbon dioxide dissolves into the ocean, it decreases the ocean's pH (making oceans more acidic) – this is called ocean acidification. Due to the drastic rise in carbon dioxide emissions caused by human activity in the past few decades, ocean acidification is occurring at a faster rate. It is immensely harming marine biodiversity and as a result humans too.

Carbon Sequestration

Removing carbon dioxide from the atmosphere and containing it in a solid or liquid form is called carbon sequestration. Oceans and marine life absorb more than 90 percent of global emissions regulating the amount of carbon dioxide in the atmosphere. This makes ecosystems more valuable and significant in the global climate challenge.

Overfishing

The act of taking wildlife (such as fish) out of freshwater or marine habitats at rates which are too high for fished species to replace themselves. This unsustainable process can be highly disruptive to the food chain, leading to the depletion of several ecosystem services.

Background Information

Irresponsible actions taken by governments, large corporations and even civilians have led to the degradation of multiple freshwater and marine ecosystems. Globally we have lost 50 percent of all salt marshes, 30 percent of mangroves, 30 percent of coral reefs and 29 percent of seagrasses over the past several decades. The destruction of biodiversity also negatively impacts the economy. According to the United Nations (UN) report, the global economy will lose \$1 trillion annually by the end of this century if oceans are not safeguarded. Furthermore, according to the World Wide Fund for Nature (WWF), half of the planet's wetlands have been drained, filled, planted or paved causing animals such as crayfish, fish and mussels to disappear faster than marine and tropical forest species. The rapid destruction of ecosystems will eventually lead to a complete loss of their vital services, and it is essential that policies are implemented to slow down and begin to rebuild damaged ecosystems.

Freshwater ecosystems supply water to groundwater as well as the wider land around, and is around 30% of the world's fresh water. 35% of the world's population is dependent on groundwater from freshwater ecosystems. Also, more than 775 million people depend on marine ecosystems for their in ways such as but not limited to nutritional, economic, cultural, and coastal protection benefits. As such, protecting freshwater and marine ecosystems is vital to our survival as a human race, as well as for the

next generation. In many areas, especially populations living in coastal regions, marine ecosystems, the conditions necessary to sustain life are either in jeopardy or nonexistent.

Climate change

A prominent factor that leads to the destruction of habitats is climate change. The rise in global temperatures and the excessive amount of greenhouse gases trapped in the atmosphere have harmed our oceans the most. According to the UN, oceans have absorbed 93 percent of all the heat people have added to the atmosphere since 1950. This has greatly reduced the direct impacts of climate change on humans. However, the rise in ocean temperatures and carbon dioxide in the atmosphere has resulted in the melting of icecaps, ocean acidification and coral bleaching.

Ocean Acidification

Ocean Acidification is the result of carbon dioxide from the atmosphere dissolving in the water to form carbonic acid. as carbon dioxide rates continue to rise, the pH of oceans is steadily decreasing, The rise of ocean acidity continues to negatively impact marine ecosystems. Coral reefs - which are home to an abundant amount of marine species - are under threat. While sustaining an immense amount of biodiversity, 275 million people, according to UNEP, also rely on reefs for their livelihood. Ocean acidification affects the structure of the reef, reduces reef growth and also may indirectly result in the mortality of reef-builders. This will result in irreparable consequences for marine species, significantly altering the function of entire ecosystems and have prominent societal and economic repercussions. According to UNEP, a square kilometer of healthy, well-managed coral reef can catch over 15 tonnes of fish each year. Coral reefs provide vast services which are irreplaceable. They generate revenues from tourism, prevent erosion, protect coastal areas from extreme weather events and reduce damage during storms. An eroded coastline also removes the first barrier to coastal flooding, making large coastal cities such as Mumbai and Sao Paulo under threat of disappearing into the ocean.

A drop in ocean pH affects the ability of shelled marine life such as plankton in forming their carbonate based shells, which are eroded and dissolved in acidified waters. Plankton are the basis for the ocean's food web, and their destruction will collapse marine life and therefore all life for our future generations.

Overfishing

Marine fisheries directly or indirectly employ over 200 million people, according to UNEP. Furthermore, it is estimated that marine and coastal industries account for about 5 percent of GDP globally. The abundant economic benefits of (mostly unsustainable) fisheries make it difficult for the practise of overfishing to be eradicated as millions rely on it economically. According to the Food and

Agriculture Organization of the UN, the number of overfished stocks internationally has tripled and at present one third of the world's assessed fisheries are pushed beyond their biological limits. In addition to this billions of people rely on fish for their primary source of protein. According to UNEP, oceans provide the world's largest source of protein for more than 3 billion people rely on it as their primary source of protein. Globally, the demand for fish continues to rise, resulting in more businesses and jobs to depend on these resources. The exploitation of ecosystems while overfishing makes it increasingly difficult for the environment to recover the losses.

Illegal fishing is not condemned by many and only makes the issue worse. Pervasive illegal fishing is estimated to be around 30 percent of catch or more for high-value species. The profits made by illegal, unregulated and unreported fishing nets criminals are predicted by experts to be around \$36.4 billion each year. Lack of systems to track fish from catch to consumers (traceability) and import controls in the industry allow illegal catches to be transported through opaque supply chains. This results in a completely legal cycle of overfishing which will lead to the destruction of marine and freshwater ecosystems – further decreasing environmental sustainability.

Without rigorous measures to prevent overfishing, populations dependent on marine ecosystems are in danger of economic collapse, which may also lead to social issues and even mass emigration.

Pollution

Another factor leading to the destruction of ecosystems is the consistent pollution carried out by individuals and corporations. Every minute, one dump truck full of plastic waste enter the oceans; this accumulates to 8 million tonnes of plastic entering the ocean every year. Due to the continuous increase in the quantity of solid waste, marine litter is found at sea, on the seafloor and coastal shores. Resulting in a multi-dimensional challenge, the issue poses negative economic, environmental, human health and aesthetic problems. In 2016, according to UNEP, more than 335 million tonnes of plastic were produced internationally but only a very small percentage were recycled. Plastic is an extremely durable material so if it is not recycled and is rather disposed of in places like rivers and oceans, it breaks down into microplastics. Micro-plastics may contain chemicals such as persistent organic pollutants that may be transferred into the food chain upon ingestion by organisms. At the moment, unless the management of solid waste is improved, the situation is likely to get worse.

One of the biggest threats to freshwater ecosystems is from the byproducts of fecal waste, industry and agriculture. Pesticides and fertilizer runoff enters into freshwater ecosystems disrupting the balance of life by over producing algae, which depletes the oxygen levels of the water killing the animals living in it. Fecal matter enters freshwater ecosystems contaminating the water supply and introducing small amounts of pharmaceuticals and hormones into the water, which impact all life dependent on that water.

Economic implications

The abundant benefits derived from ecosystem services are worth trillions of dollars. The destruction of such sources threaten food security, the pharmaceutical industry and the tourism industry. Accounting for 70 percent of total global water withdrawals, agriculture uses the highest percentage of freshwater. It helps provide energy and ecosystem services required for farming and irrigation. It is evident that global demand for food will increase because of the rapid population growth we are witnessing. Furthermore, the global economy's reliance on fishing, supporting around 260 million jobs and generating at least \$2.5 trillion worth of products and services each year. Employment relating to fisheries must be sustainable or else this will result in severe unemployment once most are species endangered.

Major Countries and Organizations Involved

United Nations Environment Programme (UNEP)

The leading international environment authority is the United Nations Environment Programme (UNEP); it sets the global environmental agenda and promotes the logical execution of environment related sustainable development within the United Nations. To address the issue of marine pollution, UNEP holds the Secretariat for the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA). The GPA aims to eliminate marine degradation from land-based activities by guiding national and regional authorities for devising and implementing sustained action. UNEP highlights the economic value and benefits of healthy ecosystems; the organization does this through multiple means including, spreading awareness of human dependency on ecosystems and promoting knowledge products and tools on how to account for ecosystem services. Additionally, UNEP advocates for the use of reliable science to manage ecosystem services in marine and coastal areas. The organization demands countries and companies to take the environment into account while making their policies. Due to the UNEP's prolonged efforts along with those of other entities, 23 percent of the 93 environment-related SDG indicators will be accomplished on time. However, this progress is clearly not enough to actually meet the SDGs by 2030 and possibly maybe too little to save some ecosystems.

United Nations Development Fund (UNDP)

The United Nations Development Fund works closely to achieve the SDGs and aims to eradicate poverty while protecting the planet. The organization works in around 170 countries and territories; it helps them create strong policies, skills, partnerships and institutions to sustain their progress towards SDGs. On January 1st 2015, the UNDP adopted mandatory Social and Environmental Standards for all of its projects. These standards ensure social and environmental benefits for the people they serve by

increasing the quality of the organization's efforts. To address the issue of biodiversity loss and ecosystem degradation, the UNDP has more than 300 projects in over 140 countries. Furthermore, the UNDP supports SDG14 – life below water. It does this through encouraging sustainable fishing, applying area-based ocean and coastal management, reducing marine pollution and increasing and strengthening marine protected areas. The UNDP's Water and Ocean Governance Programme (WOGP) takes ecosystem-based approaches to effectively manage freshwater and ocean resources. WOGP operates in over 100 countries and applies its solutions at local, national, regional and global levels.

World Wide Fund for Nature (WWF)

The World Wide Fund for Nature (WWF) is an international non-governmental organization (NGO) working towards a better environmental future. It is one of the world's leading conservation organizations, working in about 100 countries. The organization is heavily involved in conserving marine and freshwater ecosystems. WWF work in key river basins around the world, supporting responsible water use and implementing innovative solutions to conserve and protect natural capital. They also develop and share tools, techniques and knowledge from their past projects globally. One major project supported by WWF is the conservation of Pantanal which is the world's largest wetland. To protect marine life, WWF advocates for sustainable fishing. The organization works globally to scale improvements in fishing, reduce the catch of iconic ocean wildlife and eliminate incentives for illegal fishing. Moreover, WWF works with the Global Mangrove Alliance to fulfill the goal of expanding the extent of mangrove cover by 20% by the year 2030.

Ocean Conservancy

Ocean Conservancy is one of the few NGOs which aims to protect marine life. It has worked to prevent ocean acidification, pollution and overfishing. The organization collaborates with coastal communities, scientists, advocates and community leaders to address these intricate issues. Ocean Conservancy is heavily invested in research and awareness about problems related to marine ecosystems. In the past they have held a coral scientists discussion in Florida to address ocean acidification. Over the past few decades Ocean Conservancy has made abundant progress towards eliminating overfishing and rebuilding fish populations in the USA. The NGO has collaborated with universities to develop POSEIDON – a powerful fisheries policy simulator. POSEIDON helps fishery managers find realistic solutions to achieve sustainable fishing. They lead the International Coastal Cleanup annually; this event aims to get rid of pollution in oceans.

The Reef-World Foundation

An independent, international NGO concerned with conserving marine and coastal biodiversity through educating people is the Reef-World Foundation. The foundation's main project is the Green Fins

which is an initiative they run with UNEP. Green Fins aims to protect coral reefs through the supporting a sustainable diving and snorkeling industry, by doing this the initiative also encourages sustainable tourism. Making tourism more sustainable is vital since it is one of the largest and fastest growing industries internationally. Members of the initiative are actively working towards lowering their impact on ecosystems by adopting more environmentally friendly policies. Partnering with the Stairway Foundation, an NGO based in the Philippines, the Reef-World Foundation has helped them with a programme named Environmental Awareness for Children and Youth (EACY). EACY aims to educate children on marine environment, environmental issues that threaten them and how to get involved in sustaining their local and marine resources.

Timeline of Events

Date	Description of event
June 5 th , 1972	United Nations Environment Programme is founded; UNEP is the main UN organ concerned with the environment.
June 13 th , 1992	Agenda 21 is adopted with 187 governments voting in favor of it. It is a non-binding UN plan regarding sustainable development and can be implemented in every area where humans impact the environment.
January 1 st , 2016	The 17 Sustainable Development Goals officially come into force; the SDGs aim to solve multiple issues relating to protecting ecosystem.
April 22 nd , 2016	The Paris Agreement is signed by 195 countries. It's aim is to strengthen global response on and increase the ability of countries to combat the impacts of climate change.

Relevant UN Treaties and Events

- World Tuna Day, 7 December 2016 (**A/RES/71/124**)
- Our ocean, our future: call for action, 5 December 2017, (**A/RES/73/124**)
- Oceans and the Law of the Sea, 9 May 2019, (**A/RES/72/124**)
- UN Decade on Ecosystem Restoration 2021-2030, 1 March 2019, (**A/RES/73/284**)

Previous Attempts to solve the Issue

Ecosystem report card

Multiple developing nations may not have thorough domestic freshwater ecosystem monitoring systems established. However, comprehensive monitoring information can be obtained at particular sites through private sector studies. These studies can encompass the impacts of development on biodiversity

and thus give governments and corporations vital data on the state of their ecosystems. This can help governments create better policies and prompt companies to strongly consider becoming more sustainable. Creating an ecosystem health report card has been previously done for Strickland River in Papua New Guinea, where a gold mine operates near the river. The creation of this gold mine was approved on the condition that an environmental monitoring and management programme was established. This monitoring programme, since 1990, has obtained extensive data on the water quality and other details of the Strickland River. Additionally, to observe the overall environmental and social sustainability of the mining operations, an independent committee was established. The project proves that the absence of a government led monitoring programme does not necessarily result in no research. The private sector can be employed in such projects. Data obtained from the report card can help governments, companies and the general public understand the implications of development on the environment - prompting them to be more inclined to take action.

Clean-up programme

Many ecosystems have been heavily polluted by a complex array of sources. Although significant recovery is usually possible, restoration can take decades to be implemented and always demands adequate funding and prolonged engagement with relevant stakeholders for management actions to be sustainable. To restore one of the most polluted in Brazil, the Upper Tiete River Basin Clean-up Programme was implemented. Rapid population growth around the Upper Tiete River Basin caused serious water quality and quantity issues. The inadequate treatment of domestic and industrial wastewater, poor collection and disposal of solid waste, toxic chemicals and many more factors led to extremely low levels of dissolved oxygen. The result of this was that the freshwater ecosystem was severely degraded. In order to solve these issues, the programme tried to increase sewage collection. However, the programme encountered socio-economic barriers since households in poor areas were unable to afford the connection fees. For these instances, the São Paulo government covered the costs. The programme improved the ecosystem by: raising the wastewater collection by 70-87 percent and tripling the treatment of domestic wastewater between the years 1991 and 2015. These improvements resulted in fish returning to some location of the river and the reduction of unpleasant odours. Despite the considerable progress, as of 2015 the river's water quality does not comply with human use standards and most city inhabitants have not noticed an improvement in water quality. This highlights the need for sustainable action and management of destroyed ecosystem as these problems cannot be instantly solved.

Possible Solutions

Raising awareness

The general public in most nations has a lack of knowledge on human impacts on freshwater and marine ecosystems. Furthermore, most civilians are unaware of the numerous benefits and services provided by these ecosystems. Educating the public on the consequences of their harmful actions on biodiversity and teaching them about how they can prevent the destruction of ecosystems may prompt them to be more inclined and determined to change. Raising awareness is especially important for the youth as they are typically more open-minded and impressionable. Previously, some NGOs have created trips for children where they take them to visit different ecosystems. During these trips, children are taught more on protecting the environment. In addition to this, governments should consider incorporating human impacts on biodiversity into their various curriculums.

Involving the private sector, NGOs or UN organs

Many Less Economically Developed Countries (LEDCs) around the world may not obtain the (financial) resources to focus on countering human effects on biodiversity. In these cases, it would be extremely beneficial to include other organizations and sectors to aid nations in combating the issue. The vast majority of countries around the world have a growing private sector. These large corporations' projects can only be approved by the government when they agree to invest in research and renewable energy and also reduce their impact on the environment. Governments can make it obligatory for large companies to release reports on its environmental impacts; these reports can be fact checked by NGOs or even UN organs. Governments may also choose to collaborate with NGOs and UN organs (such as UNEP) to conduct research and aid them in overcoming present barriers to protect degrading ecosystems.

Adopting sustainable policies

It is a fact that the resources on our planet are finite – this is especially true for freshwater and marine ecosystems. Therefore, all governments must adopt and implement policies which allow us to sustain our finite resources for generations to come. The SDGs were created for this purpose. However, most countries are not on track to meet all the SDGs including SDG 13 (climate action) and SDG 14 (life below water). The key to sustainable development is realizing our benefits in taking actions which are truly beneficial for the long term. If resources such as ecosystem services are not protected, conserved and sustained, only destruction lies ahead. Extreme weather events such as droughts floods and storms will become more common, threatening our existence on our planet. To prevent this, marine and freshwater ecosystems must be taken into account while creating and implementing policies and it is imperative for SDGs relating to the issue to be achieved on time.

Guiding Questions

1. What types of marine and freshwater ecosystems does your country obtain? Are these ecosystems conserved and sustainably managed? If not, why?
2. How can you implement and encourage the sustainable use of resources within your nation and world wide?
3. What are the barriers (relating to the protection of biodiversity) faced by your nation's government? How can these barriers be overcome?
4. How can your country progress towards accomplishing SDG 13 (climate action) and SDG 14 (life below water)?
5. How effective are your nation's policies which regard oceans and freshwater ecosystems? How can loopholes within policy be fixed?
6. What environmental NGOs and UN organs operate within your country? Can such environmental programs be promoted and encouraged?
7. To what extent are the citizens of your nation aware of the implications of their actions on biodiversity? How can you increase this awareness?
8. How can your country sustainably manage its natural resources so the degradation of ecosystems is prevented?

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Appendix or Appendices

- I. www.unenvironment.org/civil-society-engagement/accreditation/list-accredited-organizations (List of Accredited Organization)

The above website is highly useful for learning more about UN approved NGOs which are related to the environment. It displays all the NGOs' URLs to go to there websites and mentions what particularly the NGO specializes in and the region where the NGO is based.

- II. <http://environmentlive.unep.org> (Environment Live)

Environment Live is a website set up by the UN Environment Programme. It is beneficial for understanding the current state of the environment; it displays all SDGs, their targets and their indicators while displaying

statistics and data showing the progress we are making towards the goals. Furthermore, the website elaborates on climate change and pollution statistics.