

PAMUN XVIII RESEARCH REPORT— Question of the Sustainable Use and Management of Marine Resources

Introduction of Topic

The ocean, thought to be the birth place of life itself, is one of the most crucial resources humanity has. Even the resource of life, water, originates from the ocean. We sometimes think of earth's marine resources as an unlimited resource due to the sheer size and depth of our oceans, but this is not the case. With 37% of the global population living on the coast, many communities rely on the ocean as their major source of food, health, energy, and transportation. The ocean even produces oxygen and drinking water, the catalyst for life. In an age of mass production, efficiency, and massive population booms, our global fish consumption has climbed rapidly. In addition to being source of food, the ocean brings tourism, life styles, and materials to communities. On the environmental side of things, the ocean is a crucial contributor to human health and food security, serving as a barrier that regulates global climate by sinking greenhouse gases and holding large reservoirs of biodiversity.

The ocean is a very important resource to all persons in a multitude of ways. Thus that is why it must be protected. Modern issues like overfishing and pollution has threatened the availability of the ocean as a resource. Overfishing may cause us to lose species of fish most common in our diets like the almost extinct Southern Atlantic Bluefin. If the natural beauty of the ocean degraded, a community may suffer economically and socially.

Understanding the interconnectedness of the sustainable development goals means understanding that the ocean is an important pillar in upholding the sustainability of all social, economic, and environmental faces. The wellbeing of the ocean is a factor in Goal 1 (poverty), Goal 7 (energy), goal 15 (biodiversity) and many others. This makes the careful safeguarding of the ocean an important step in true sustainability. To achieve such a step, goal 14 of the United Nations Sustainable Development Goals for 2030 “Life Below Water” is our ultimate goal. It reads “To achieve sustainable management and protection of marine and coastal ecosystems”. The UN must treat the resources of the sea with pristine sustainable standards just as much as it promotes sustainable use of land resources. Then, we may also cherish the predicted benefits like target 14.7 to increase the economic development of small island developing states through sustainable marine resource management or boosting small artisanal fisheries by providing access to marine resources.

Definition of Key Terms

Marine Resources

According to resources from a Californian University, Marine resources can be separated into three categories: Physical Resources (natural): minerals, oil, and gas. Biological resources: seafood, plant life, ecosystems. And Nonrestrictive resources: the use of the ocean for biodiversity and tourism.

The last category is not a conventional type of resource, as it doesn't exist for things like land resources, but it can still be exploited beyond sustainability.

Renewable Resources

The International Energy Agency (IEA) defines renewable energy as: "Energy derived from natural processes (e.g. sunlight and wind) that are replenished at a faster rate than they are consumed. Solar, wind, geothermal, hydro, and some forms of biomass are common sources of renewable energy." The general definition of a renewable energy would be energy that is from a source that replenishes within the timescale of human history. These types of energy are often seen as the most sustainable means of generating energy.

Sustainable Use

Sustainable use defines the responsible consumption of a resource in which the resource is not over consumed, and is able to replenish itself. An example would be **wave** energy, energy produced from the movement of the waves in the ocean. This energy is sustainable because waves do not diminish seeing as their energy comes from the gravitational pull of the moon.

Overfishing

Over fishing is the exploitation of the world's fish reserves to depletion and unsustainable levels. It manifests itself through the hunting of near-extinct fish species, ignorance of protocols in place against fishing off season, or simply fishing at an unsustainable rate, by passing quotas. The International Union for Conservation of Nature (IUCN) estimates that as much as 75% of the world's fisheries have been over exploited, threatening their sustainability. In addition, the Food and Agricultural Organisation estimates that 1/4 of the global fisheries are presently unstable.

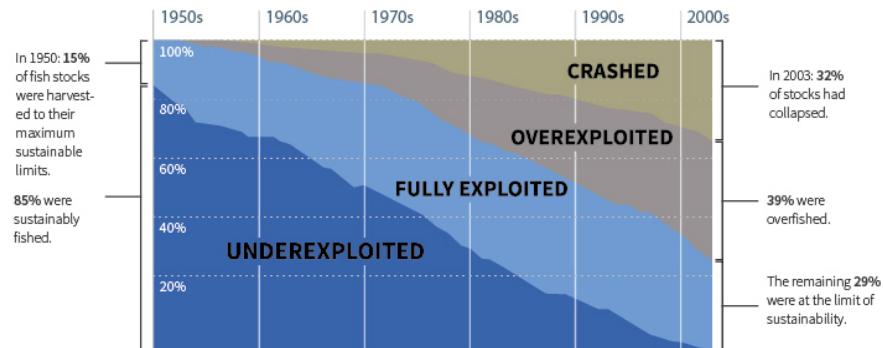


Figure 1. Graph over time of Overfished Fisheries

Background Information

Physical resources

Oil and Natural Gas

Assuming our population and production will require the same amount of petroleum in the future, our supply of oil is estimated to deplete as soon as 2052. Gas too is very much scarce and unsustainable. The oil industry is also environmentally unfriendly in their methods of extraction and transmission with the potential to create large oil spills. Such man-made disasters cause oil to seep in and harm marine life, birds, and habitats. Not only is oil inherently unsustainable, due to the thousands of years required to produce it, but the methods of harvesting oil like seismic blasting and offshore drilling have been reported to impact marine life. Seismic blasting for example has been reported to move several species of whales away from normal feeding and breeding areas and fish to swim deeper in to the ocean. Such actions are not only ethically controversial but threatening to our understanding of our fish supplies. According to Oceana, the catch rates of the fish cod and haddock have declined from 40-80% after seismic blasting. Meanwhile the transportation of this oil risks oil spills. In 2010, the multinational oil company British Petroleum's off shore oil rig suffered a wellhead blowout and caused at least \$94.7 million to be lost in the fishing industry due to the resulting oil spill. Figures rapidly dropped with catch rates of shrimp, oysters, crab, and menhaden being affected the most.

Minerals

Some minerals harvested from the seabed include: sand, gravel, magnesium, salts, copper sulphide ores, cobalt-rich manganese crusts, sulphur, sulphide deposits, manganese nodules, phosphorite, and coal. Seeing as these minerals are not resources that are not in danger of being over exploited (aside from coal), they are less of a concern than other marine resources. Despite however new the field is, potential and interest in the field is growing. Research says that an exploitation for some deep sea minerals may also lead to the degradation of abyssal fauna and subsequently marine biodiversity. Technology for deep sea mining is improving and therefore is getting

more capable of overexploitation. Because of its newness, few regulations exist on the national level (New Zealand and Papua New Guinea being two of the few states) and international law defined in the UNCLOS is not uniformly agreed upon due to strict requirements. This may require further regulations in the future.

Energy Resources

The ocean can be used as a source of energy and is therefore a resource. Aside from the oil and natural gas extracted from the sea floor. The energy production generated from the ocean are sustainable - including wind energy, hydroelectric energy, and wave energy. However, the world still largely relies on unsustainable resources because of the already invested development to the oil, gas, and coal industries. Dependency on unsustainable resources have sparked a movement towards sustainable energy like the ones from the ocean (waves and tides) however the current investment and technology in ocean energy resources is not enough to compete against oil, gas, and coal.

Biological resources

The ICUN estimates that as much as 75% of the world's fisheries have been over exploited, threatening their sustainability. A large part of overfishing consists of the biological resources we use for consumption like eating, making fish oil, or making animal feed. Meanwhile there are other problems of overfishing like bycatch of noncommercial fish that degrade marine biodiversity but these topics do not fall under the biological resources category

Fish and Marine Mammals

Fishing is not only intended for food consumption. One of the biggest cases of overfishing is whales and whaling. Whales have economic value due to their oil, baleen. As for common fish like salmon and tuna, they risk extinction in the wild due to high demands for fish. If these species are no longer exploitable in the wild, they face commercial extinction – unless as happens now, they are raised in fishery farms. These fish need to be then protected until they have replenished their populations which can take time and resources. Worse, the overfished species can even face extinction, which is irreversible damage.

Plantlife and Ecosystems

Although less known than the overfishing of fish, over harvesting of marine plant life exists as well. These plants are often used for medicines. For example, since the 1950s, algae has been harvested in eastern Canada for a plethora of purposes. And for the past 35 years, natural resources scientists have become concerned with the sustainability of the resource. For this rea-

son, there has been successful measurements of the implications of the harvest and determination of an exploitation rate that is sustainable for Canada's coastal zone management of maritime resources.

Non-extractive resources

Tourism

Although not often thought of as a resource, the sustainability of marine resources can ensure that a country's tourism sector, especially if known for its reefs and coasts, stays profitable and naturally beautiful. An example of this would be Australia's Great Barrier Reef. From a mere economic standpoint, the reef has been estimated to contribute \$6.4 billion per year to the Australian economy. Fortunately the large tourist attraction is strongly protected by the UNESCO World Heritage Committee as well as the Australian government's own policies like the reef 2050 long-term sustainability plan and Reef trust, a framework that provides multitudes of targets, objectives, and actions directly for the preservation of the great barrier reefs. Recently, the progress reports having reduced all major port dumping of material in the Great Barrier Reef marine Park and World Heritage Area to an absolute zero. If such measures were not in place, the economy of Australia's tourism sector would be threatened with the continuing bleaching and destruction of their coral reefs. However, there are plenty of other tourist destinations that are severely exploited beyond sustainable practices. For example, mangroves and seagrass meadows are being cleared for beaches, piers and other structures are built on coral reefs, and mass tourists are disturbing natural habitats for marine life like certain species of endangered turtles. All of these examples exhibit damages to the environment on all levels, which goes to show that tourism can be an overexploited marine resource.

Biodiversity

According to the United Nations Environment Programme (UNEP) biodiversity is a measure of the variation of species, genetics, and ecosystem in a given biosphere. In the context of the food web, this means there are more relationships and interactions between species and the biosphere is more stable (meaning it's more resilient to food-web damaging events). So in order to maintain an ecosystem for generations to come (sustainability), biodiversity must be preserved. The ocean faces many threats to biodiversity, for example the previously mentioned by catch or overfishing.

United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea (UNCLOS) is a series of three conventions that establish the international laws of the sea. The treaties set forth by the United Nations Convention

Law of the Sea are the current guidelines that member parties abide by on the ocean. It is important to note that while the convention is well established, having been ratified by 168 parties, 14 UN states have not yet ratified the convention as well as the United States of America not having signed the convention due to disagreements over part XI and Exclusive Economic Zones (EEZs). The treaties discuss many matters regarding the ocean but the relevant state's rights pertaining to this topic are listed below.

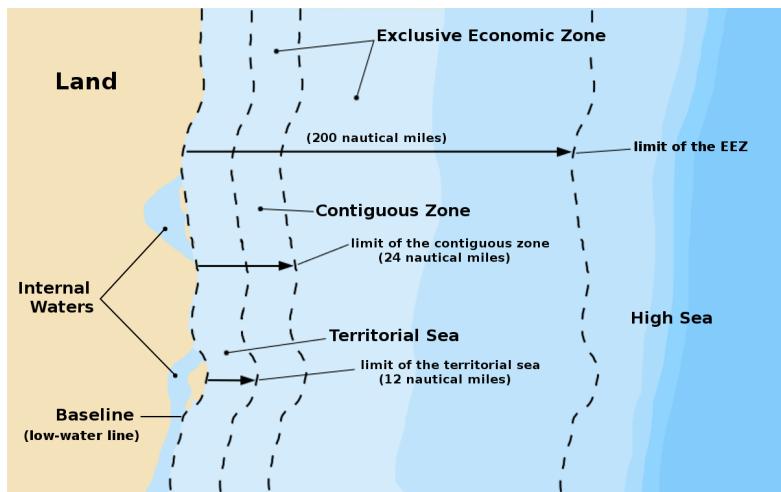


Figure 2. Geographical map of where different seas are defined by the UNCLOS

Exclusive Economic Zones

As one of the most important features of the treaties, in particular part XI of the 1994 agreement, the Exclusive Economic Zones or EEZs define an area 200 nautical miles out from a country's coastline where the state has special rights regarding use of some marine resources. This zone is differentiated from territorial waters, which define a perimeter (12 nautical miles outwards), where a state has full sovereignty over the waters while the EEZ defines an exclusive right to the resources in the zone. The specific use of these EEZ are usually for harvesting and regulating fisheries, generating energy, and constructing man-made islands. The standards for exploitation are outlined but not specifically defined in the Code of Conduct for Responsible Fisheries of 1995 [Appendix 1]. The agreement is not binding but instead serve as a model for which country's fisheries management rules should be based on.

The Continental Shelf

The continental shelf is an area in which a state is given exclusive rights to all other marine resources. There is a naturally defined border that spans from 200 nautical miles out to the outer edge of their continental shelf (a region where the continental margin is shallow before dropping to larger depths). Resources in this area are available exclusively to a single coastal state in this zone. Common resources harvested in these regions include the oil, gas, and minerals.

The High Seas

The high seas define international waters: where the area's resources can be used by any and all countries. Any mining or exploration of the high seas is licensed and regulated by the International Seabed Authority (ISA), an organization established by the UNCLOS treaties. Although mining in the high seas is considered very difficult and not a common practice. Although fishing is mostly done in EEZs, the UN fish stocks treaty of 1995 manages fish stocks of the high seas (see previously attempted solutions under "UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks").

Major Countries and Organizations Involved

International Union for Conservation of Nature (IUCN)

Founded on the 5th of October 1948, the IUCN is a large international membership union that has the goal of assessing and providing knowledge to public, private, and non governmental organisations so that they can properly act on conservation projects. This union reaches out to about 1,300 member organisations and cumulatively bring together 16,000 experts. Although they do not tackle the issue of marine resources directly, they do assist and aid governments with conservation projects by providing insight and information.

Oceana

Oceana is one of the premier international organisations that serve to protect the world's oceans. The largest concern of theirs pertaining to this subject matter is over fishing and the waste and unsustainable catching of seafood. The organisation claims to provide proper management of fisheries that would increase their yields by 40% as well as be able to launch seafood as a food source to feed 700 million people by 2050. To help this process, they employ their resources to scientific reports that can identify problems and solutions for an oceanic ecosystem.

The World Ocean Council

The WOC, launched in 2008, is an international organization focused on the corporate ocean responsibility. The Council convenes many ocean-related companies concerned with the well-being of the marine environment and its resources. The group works towards establishing itself in many other marine corporations as well as providing research and guidance on their mandate, having organized conventions like "Oceans 2050 – The Ocean Business Community and Sustainable Seas" and the 5th "Sustainable Ocean Summit on "The Ocean Sustainable Development Goal (SDG 14): Business Leadership and Business Opportunities.

Regional Fishery Management Organisations

RFMOs are not a single organisation but rather a collection of a type of international organisations tasked with managing the fisheries of either single species, or specific regions. These organizations play a prominent role in the 1995 Fish stocks agreement like for example the RFMOs that regulate highly-migratory tuna species like the International commission for the Conservation of Atlantic Tunas (CCAT) and the Inter-American Tropic Tuna Commission (IATTC). There are also regionally based RFMOs like the North-East Atlantic Fisheries Commission (NEAFC), South Pacific Regional Fisheries Management Organization (SPRFMO), and many more.

Timeline of Events

Date	Description of event
1958-1982	United Nations Treaties were established and called the “Laws of the Sea”
1966	Convention on Fishing and Conservation of Living Resources of the High Seas
1995	UN Fish Stocks Agreement
1995	FAO’s Code of Conduct for Responsible Fisheries
September 19 2010	British petroleum oil spill
2015	Transforming our World: The 2030 Agenda for Sustainable Development
June 2017	UN Ocean Conference

Relevant UN Treaties and Events

- Convention on Fishing and Conservation of Living Resources of the High Seas, 29 April 1958
- United Nations Convention on the Law of the Sea, 16 November 1994
- UN Fish stocks agreement, 4 December 1995, (A/CONF.164/37)
- Code of Conduct for Responsible Fisheries, 1995

Main Issues

Illegal Exploitation

Despite the protocols and restrictions in place, the unauthorized fishing, mining, and harvesting of marine resources exist. These problems contributes to the depletion of fish stocks and biodiversity in the ocean ecosystem, especially in developing coastal countries. Since they are illegal, unreported, and unregulated (IUU), the degree to which the problem feeds unsustainable methods is unknown, however the margin in legal registered fish caught and fish in the economy is large enough to point out a discrepancy that throws off sustainable resource studies. It is estimated that about one-fifth of global catch per annum falls under IUU fishing. IUU exploitation exists because it lets someone evade tax and it is easy to do so without facing governmental consequences. This thrives in governments with weak legislation, corruption, and no enforcing body to regulate resource quotas.

Issues with Coral Reefs

As demonstration with the discussion of tourism in Australia's Great Barrier Reef, coral reefs are an important marine resource. Estimates say that coral reef is valued at about \$172 billion per year. However the many benefits of healthy coral reefs are threatened by unsustainable tourism and over exploitation of the resource. The corals faces the problem of coral bleaching, a process that ruin the environment of many coral reefs around the world. There have been about 60 mass bleaching events since the 80s. The most destructive events just ended in 2017 where the about 70% of the world's coral reefs were damaged. Unfortunately, the rate at which these events are only expected to increase, which would threaten our sustainable use of coral reefs. Coral bleaching have many known causes, some examples relating to unsustainable marine resource management include: the process of capturing fish by dumping a cyanide mixture in habitats to stun fish (cyanide fishing), fluctuating water temperature due to global warming (which in of itself has many causes), and overfishing and indiscriminate fishing can deplete species of fish that use coral as their habitat.

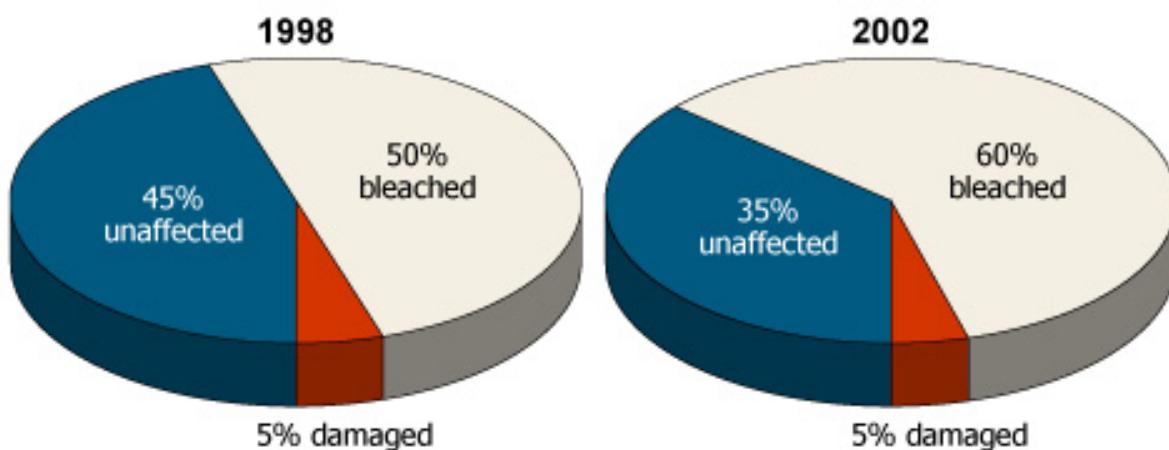


Figure 3. Pie chart comparing bleached coral reefs of 1998 and 2002

Ocean Pollution

Ocean pollution can take many forms, plastic disposal in the ocean, offshore drilling oil spills, and ocean acidification (caused by air pollution), and even noise pollution from ship navigation systems and ocean floor mapping systems. All forms however revolve around the consequence of exploiting biodiversity by harming, restricting, and migrating marine life. Despite numerous organizations, international and domestic law, and efforts to clean the ocean, about 1 million seabirds and 100,000 sea mammals are killed by pollution every year.

Inadequate Fisheries

As for overfishing, even legal fisheries struggle to meet sustainable standards. Every country has sovereign rights over different fishing quotas in their EEZs (although international bodies and RFMOs do monitor this as well). As for the high seas, there are few international fishing regulations. A degree of bad policy can be attributed to continuing debates over the UN convention law of the sea and UN fish stocks agreement, which explains why there are countries who have not ratified the agreements.

Then the fisheries themselves sometimes put in place higher quotas on catch than the national standard, disregarding scientific and international advice. This sort of practice slips away uncontested due to lack of monitoring and transparency.

Controversial Methods in Extracting Marine Resources

The largest example of which include seismic blasting, which is backed up by many industries and politicians but challenged by various environmental organisations and governments. The arguments for the method is its effectiveness in finding oil and natural gas, as well as making out our oceans. However the side effect of the practice is that it has been found to injure several marine life, threatening biodiversity and therefore sustainability of the marine biological resources.

Lack of Regulation over High Seas

According to the Guardian, only about 3.5% of the world's oceans are legally protected. Making the rest of the 96.5% prone to over-exploitation, pollution, overfishing and over mining. It is only until recently that progress has been made in this regard. After 5 years of negotiation, the UN is set to establish a new rulebook by 2020, and a specific treaty for the high seas has been tabled before the end of the year. Unfortunately, the move has some opponents. Many major fishing nations have shown hesitation like Iceland, Japan, and South Korea, by pushing for the exclusion of fishing in the treaties. On another end of the spectrum, the lack of regulation over the high seas also hinders our scientific knowledge of it, its biodiversity, and its sustainability.

Previous Attempts to solve the Issue

The following are the few major international attempts to solve the issue. Many nations have adopted their own policies in terms of fishing quotas and resource management for their specific EEZs and continental shelf but they're very individually catered and are therefore not included.

Convention on the Law of the Sea

[2] The main major international attempt to solve the issue is the United Nations Convention on the Law of the Sea, yet it mostly focuses on how the sea is divided between states, and what are the rights of passage. There is the following relevant articles:

The convention's section 2 from article 116 to 120 discusses the conservation and management of the living resources (biological resources) of the high seas. Article 145 is the only discussion of sustainable marine practices in the high seas which calls for "the protection and conservation of the natural resources of the Area [Seabed] and the prevention of damage to the flora and fauna of the marine environment". The articles do not discuss of oil and natural gas, tourism, marine plant life, and biodiversity.

The relevant articles are posted in the appendix for reference.

Convention on Fishing and Conservation of Living resources of the High Seas

[3] In conjunction with the UNCLOS, this convention extends the articles listed from 116 to 120, but is still limited to living resources on international waters. The convention is posted in the appendix for reference.

UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks

[1] This conference produced the Straddling fish stocks agreement or 1995 Fish stocks agreement. Ratified by 84 parties, the conference promotes cooperation in management of fisheries between the UN and member states. The issues the agreement tackles are straddling and highly migratory fish, fish species with wide distributions around the world like tuna. These species are especially prone to overexploitation due to inefficient fishery management and need for global communication on the problem.

Possible Solutions

In this year's PAMUN conference, delegates are expected to write specialized clauses, which should later amount to a coherent resolution with each of them addressing a specific aspect of the topic. When writing their clauses, delegates are to focus on a specific aspect or a "specialized topic" of the general issue that are outlined by 'major issues' and 'possible solutions' of this report. During your conference, chairs will deliver their delegates with more specific instructions. However, please keep in mind

that these ideas do not in any way set restrictions for debate. Moreover, each solutions have both its benefits and disadvantages that delegates should thoroughly consider.

Improved Fishery Management

There are various methods of improving fishery management and sustainability. For example, Catch Document Schemes (CDS) can mitigate IUU fishing and ensure that catch is legal by tracking fish stocks from capture to the market. Such documentation can help identify illegal fisheries and foster consumer awareness on which seafood is legal and illegal. As for international supervising bodies, the current system with RFMOs works to some extent, but has nonetheless received criticism for still not being able to control large amounts of IUU fishing through their traditional rules and sanctions. The critics say that the lack of RFMO efficiency comes from a lack of general commitment to implementing sustainable measures and an inability to identify illegal fishing when they saw it. Perhaps a refinement or redefining of the RFMOs is necessary.

Inclusion for Other Marine Resources

As seen with the many conventions and conferences related to or originating from the UNCLOS, the issue of living resources, fish, is well discussed. However, other marine resources, like oil, natural gas, minerals, tourism, and biodiversity are not. With no doubt, living resources are the largest resources of the ocean, but perhaps international standards for these resources can ensure some degree of a sustainable ocean.

Aquaculture and Mariculture

Aquaculture and Mariculture is the practice of cultivating fish for food. The practice is sometimes seen as a sustainable method of farming fish for food, instead of overfishing ones in the open ocean. Examples of states with large aquaculture and mariculture include China, India, and Vietnam. Although the practice is still contested on whether it is truly sustainable as some believe the farm decreases biodiversity and may spread diseases and parasites to other wild fish. However, this is up to debate.

High Seas Drafting

The vote on whether to draft up a treaty on the High Seas is tabled for the end of the year. For the purpose of debate, the drafting of clauses related to the High Seas will be in order during PAMUN XVIII. Therefore the need for a new global agreement will be met by this committee's discussion on possible legislation for this Treaty of the High Seas. There is great hope among many environmental and marine groups that the surging interest in the High Seas is a spark for a "Paris Agreement" of the Seas. The primary thing that must be addressed is: what is a state's binding legal obligations to the conservation and sustainable use of marine resource sustainability beyond national and geological jurisdiction. The answer could be a shared collaborative, a "clean-up-after-yourselves" narrative, a mix, or others. The best course of action will be left to debate.

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Appendix or Appendices

- I. Code of Conduct for Responsible Fisheries
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 - a. http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf
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 - a. https://www.gc.noaa.gov/documents/8_1_1958_fishing.pdf