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ENVIRONMENTAL

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Topic I:

Pacific trash vortex and possible solutions for oceanic pollution

I. Background

Pacific trash vortex or The Great Pacific Garbage Patch as an exceptional example of oceanic pollution is a collection of marine debris (litter that ends up in large bodies of water) situated in the North Pacific Ocean between the West Coast of America and Japan. The position of the trash vortex is affected by two factors. The first one is the North Pacific Subtropical Convergence Zone where warm water from the South Pacific meets up with cooler water from the Arctic. Basically, this zone then acts like a highway helping the debris to move. The second factor is the North Pacific Subtropical Gyre, which is a system of circular ocean currents formed by the Earth's wind patterns and the forces created by rotation of the planet. The gyre with its circular motion, in fact, traps the debris. Therefore, this trash vortex is quite stable among others. Where does the pollution come from? 80% comes from land-based activities of North America and Japan and the rest comes from ships, boaters and offshore oilrigs.

The paradox of this threatening issue is that it cannot be easily seen. The area of the trash vortex is defined by the degree of plastic concentration, meaning that its parts can be big like fishing nests or actually microscopic. People tend to imagine this as a floating island of garbage but the opposite is true. Due to the microscopic particles called *microplastics* the water then looks like cloudy soup. For this reason, it is very hard to determine the area of the trash vortex.

The pacific trash vortex was first discovered by Captain Charles Moore in 1997. He was crossing this gyre area on his way back home from the Los-Angeles-to-Hawaii sailing race. His colleague, oceanographer Dr. Curtis Ebbesmayer, referred to what Charles Moore saw as Garbage Patch. Moore started to elaborate on this and in 1999 he finished his study. The monitoring and research showed that due to photo-degradation, the plastics just break into smaller and smaller pieces even to molecular level. According to a research study, about 70% of marine debris actually sinks to the bottom of the ocean.

Some plastics decompose, but meanwhile they leach toxic chemicals such as bisphenol A or PCBs, therefore it can be really harmful to the marine life and consequently to us, the consumers. It not only becomes part of animal digestive process or they can get stuck in the bigger parts of plastics, but also plastics obstruct the sunlight to reach to extremely important plankton and algae. If they do not produce nutrients, the whole food chain is harmed.

To get rid of the Pacific trash vortex is believed to be almost impossible. The first problem is "Out of sight out of mind", in other words, the trash vortex is just so far away from any state, which discourages everyone from caring and investing in the cleaning. In fact, the particles of plastics are too small to be caught by nets and what is more, even if we would be able to design required nets, the size of the ocean makes it just so difficult. However, there are international organisations, which try to prevent the garbage patch from growing and help to reduce the oceanic pollution.

II. UN Involvement

On 11th April 2013, a Garbage Patch state was recognised. It is actually a performance installation by Italian artist Maria Cristina Finucci, which was made to raise awareness and educate people about this pressing issue. Apart from this, the protection of ocean is the subject of 14th Sustainable Development Goal. This goal is: "Conserve and sustainably use oceans, seas and marine resources". Regarding this fact, United Nations held an Ocean conference in the UN Headquarters in July 2017, where the participants agreed on "Call to action", a document, which includes more than 1,300 commitments to action. The International Solid Waste Association (ISWA) used the conference to launch a new Marine Litter Task Force that will aim to ‘establish

and exemplify the fundamentally positive role sound management of waste and resources can have in the medium and long term towards mitigating and eventually resolving plastic marine pollution'.

In the long term, the United Nations Environment Programme (UNEP) protects oceans and seas through its Regional Seas Programme. The regional Seas Convention and Action Plans is the world's only legal framework for protecting the oceans and seas on the regional level. UNEP also created The Global Programme of Action for the Protection of the Marine Environment from Land-based activities. Moreover, UNESCO has an Intergovernmental Oceanographic Commission, which coordinates programmes in maritime research, observation systems, hazard mitigation and better managing costal and ocean areas. However, the key United Nations institution for the development of international maritime law is The International Maritime Organization (IMO). This organization adopted regulations to address the emission of air pollutants from ships and has adopted mandatory energy-efficiency measures to reduce emissions of greenhouse gasses from international shipping. These include the landmark International Convention for the Prevention of Pollution from Ships f 1973, as modified by the 1978 Protocol (MARPOL), and the 1954 International Convention for the Prevention of Pollution of the Sea by oil.

As we can see, much has been done by the UN and other international organizations but still it is not enough. Plastic debris causes deaths to more than a million sea birds and 100,000 marine mammals every year. It goes without saying, that more needs to be done towards saving our oceans, protecting its marine life and having healthy and safe environment.

III. Questions to consider

- What is my country's position on protection of the oceans?
- What has my country done so far?
- How can we effectively fight against the trash vortex and the oceanic pollution?

Think of creative and innovative solutions.

IV. Helpful sources

- http://www.unoceans.org/about/en/
- http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-pollution/facts-and-figures-on-marine-pollution/
- http://www.un.org/sustainabledevelopment/oceans/

- http://web.unep.org/newscentre/newscentre/un-declares-war-ocean-plastic

Topic II:

The issue of permafrost thaw and its dangerous release of bacteria and viruses: gather, examine and identify these bacteria and viruses in order to create appropriate responses

I. Background of the topic

It is not surprising to hear about the permafrost thaw, which is the consequence of global warming. Over the years of researches and scientific theories, there has been found out many different impacts on nature and us. The most important for our topic is activation of bacteria and viruses frozen in permafrost.

"Frozen permafrost soil is the perfect place for bacteria to remain alive for very long periods of time, perhaps as long as a million years. That means melting ice could potentially open a Pandora's box of diseases"[1] The bacteria and viruses are mostly hidden in remainders of dead animals or people. The environment of ice let bacteria and viruses to survive thanks to cold and darkness. Thaw of ice might possibly awake diseases we did not hear about for many years- Smallpox, Anthrax or Spanish Flu. The global warming forces us to think about impact of this fact on us. Every summer, at least 50 cm of ice melts. In fact, every year we have a bigger chance of epidemical outbreak.

After 75 years of silence, there has been awaken the bacteria of Anthrax in Jamal in North-Siberian peninsula at the end of July 2016. 12 years old boy died because of Anthrax. The bacteria had spread out from the dead body of reindeer, which death had been caused of Anthrax bacteria many years ago. Moreover, Siberia is in danger probably the most, because the melting is 2.5 times faster than anywhere else. This incident strongly urges on the UN and other world organizations to find solutions for this problem.

[1] http://www.bbc.com/earth/story/20170504-there-are-diseases-hidden-in-ice-and-they-are-waking-up

II. UN Involvement

The global warming is one of the biggest questions for UN. First possible theories about the World Climate had been discussed in 1976. Since this moment, the UN started to be aware of risks and worked on improving the world situation.

As the latest steps of the UN, we could consider the 17 Sustainable Development Goals, which came in force in 2016. Topics 13-17 are focused on global warming. Moreover, we should not forget to mention the Paris Agreement in 2015, which also focuses on reduction of warming and optimizing the conditions for us and nature to keep the planet in safety. There have not been discussed the consequences of disease recovery yet.

III. Questions to consider

- Is there a potential risk of the same situation in your country?
- What is your country position according to this problem?
- Are there any cases of these almost forgotten diseases in your country in last years?

IV. Sources

- http://www.bbc.com/earth/story/20170504-there-are-diseases-hidden-in-ice-and-they-are-waking-up
- http://unfccc.int/paris_agreement/items/9485.php
- http://www.un.org/sustainabledevelopment/sustainable-development-goals/