TOMUN 2021 Background Paper: Implementing measures to maintain and protect national biodiversity

i. Introduction of Topic

This background paper aims to inform and make suggestions that could protect the flora and fauna across the world to ensure a sustainable planet for our growing population.

- So far scientists have identified close to 2 million species but it is believed that there could be 13 million species living on our planet.
    - It is important to consider the true diversity of our planet. By limiting this to an amount that is over six times the actual value, we as a global community risk to undermine the amount of flora and fauna. By doing this, we are limiting our knowledge of connections between species, and their needs. This can lead to their extinctions and disruptions of food chains and ecosystems.
- It is important to maintain the well-being of flora and fauna because it is the foundation for all medicine, food and many man-made products.
    - Without certain animals for instance, it would have been very difficult for our ancestors to use certain animals as aids in hunting and daily life (such as goats and chickens). Not only were they important as domesticated animals, they also provided food (such as milk, eggs).
- Human extinction rate is estimated to be 1 000 : 10 000, human to animal.
- The main causes of extinction are the rapid growth of the human population and global climate change (man-made factors).

- Scientists believe our population will grow to about 9 billion by 2050 and for this, we will need to preserve biodiversity to ensure that we can all have a healthy lifestyle.
- This UN research paper will have to provide details on this issue and framework on the existence of this rapid rate of extinction, and possible solutions on how it shall be managed.

ii. Definition of Key Terms

Biome: A big portion of an environment of a region/area (such as a fir forest or grassland), which is usually characterized by its vegetation and maintained by local climatic conditions.

Buffer zone: The region adjacent to the border of a protected area; a transition zone between areas managed for different objectives.

Carrying capacity: The maximum number of people, or individuals of a particular species, that a given part of the environment can maintain indefinitely.

Ecology: A branch of science concerned with the interrelationship of organisms and their environment; the study of ecosystems.

Ecosystem: usually found within a biome (in a region or area), and comprises a set of species (flora and fauna) who are used to a certain climate and certain eating patterns. Humans have been known to damage and destroy (at times unintentionally) the complex bonds created by the organisms within ecosystems by hunting, cutting trees for more commercial space.

Ecosystem services: Ecosystem services are processes by which the environment produces benefits useful to people, akin to economic services. They include:

- Provision of clean water and air
- Pollination of crops
- Mitigation of environmental hazards
- Pest and disease control
- Carbon sequestration

Ex situ conservation: A conservation method that entails the removal of germplasm resources (seed, pollen, sperm, individual organisms, from their original habitat or natural environment. Keeping components of biodiversity alive outside of their original habitat or natural environment.

Food chain: A complex network that ranges from producers to consumers, in terms of flora and fauna. A food chain is formed by the dependence of the needs of animals who feed on organisms, who in turn, feed on other organisms, forming a full circle of dependence around each other.

Habitat fragmentation: Fragmentation of habitats occur when a continuous has become divided into separate, often isolated small patches interspersed with other habitats. Small fragments of habitats can only support small populations of fauna and these are more vulnerable to extinction. The patches may not even be habitable by species occupying the original undivided habitat. The fragmentation also frequently obstructs species from immigrating between populations. Habitat fragmentation stems from geological processes that slowly alter the layout of the physical environment or human activities such as land clearing, housing, urban development, and construction of roads or other infrastructure. Adverse effects sometimes do not immediately notice-biodiversity glossary 288 able and sufficient habitats may ostensibly be maintained. However, inbreeding, lack of territories, and food shortage are some of the problems small populations can encounter. Fragmentation of habitats is therefore expected to lead to losses of species diversity in the longer term.

Millennium Ecosystem Assessment (MA): This is an assessment of human impact on the earth called by the United Nations in 2000.

Participatory rural appraisal: PRA is a relatively new and different approach for conducting action-oriented research in developing countries. PRAs are used to help involve villagers and local official leaders in all stages of development work, from the identification of needs and decision making to the assessment of completed projects. The 291 biodiversity glossary term can be used to describe any new methodology which makes use of a multidisciplinary team. Rapid Rural Appraisal is a quicker approach that may or may not be participatory.

iii. Background Information

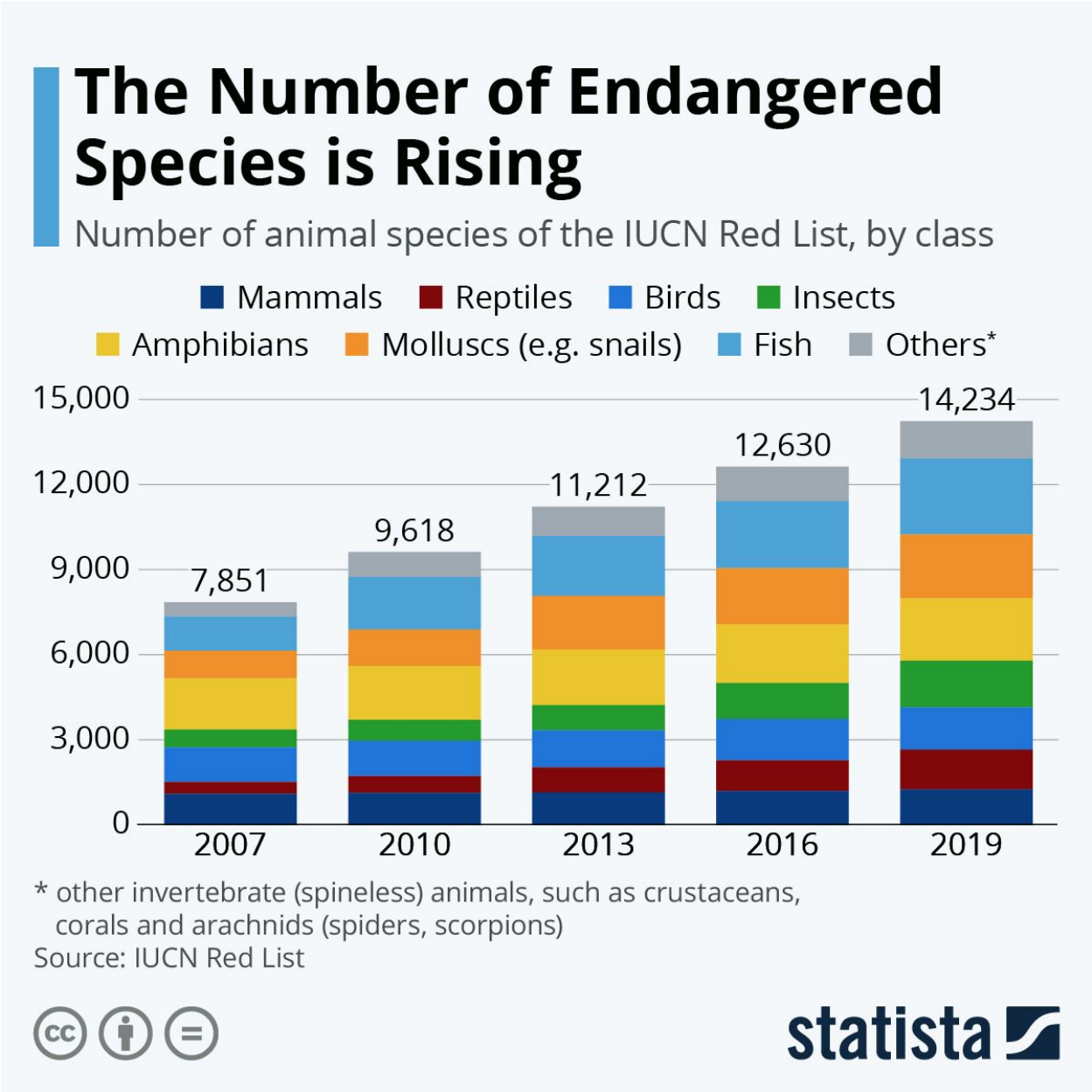
This issue has been present throughout most of human habitation on earth. Risk of endangerment of flora and fauna has been caused predominantly due to man-made factors. They include: climate change (more specifically desertification, and rapid increase in temperature), our growing needs for space as a population, and excessive pollution. Cases vary from country to country. For example, for countries located in the tropics such as India, Indonesia and Brazil, face rapid increases in temperature which directly affects marine life. Similarly, in Brazil, which houses the Amazon forest, there are threats of endangerment of both flora and fauna. The cutting down of the extremities of a forest is a loss of habitat of a plant species but also a loss of habitat of birds and small mammals. As one species dies out, this affects a food chain and ecosystem if a specific area. As one species dies out to habitat loss, it affects the diet of another species and this continues to affect other species depending on the activity of the other. The cause of flora and fauna endangerment is classified through four main causes:

1. **Habitat loss**: Urbanization has become common in the last decade and has affected the existing rural areas allocated to farms and “untouched areas of nature”. This is a consequence of the need for more space and the expansion of big cities. Deforestation is another cause, which is when more space is achieved by cutting down trees. Annually, 36 million acres of natural forest is leveled,

according to the World Wildlife Fund. The forest provides habitat for 80 percent of the world's species, the group reports (Gailliard).

2. **Global warming**: Increasing temperature in the atmosphere due to greenhouse gases. The temperature increase of one degree has a big impact on glaciers in the Arctic and Antarctic. This steady melting of glaciers affects the habitats of polar bears and also marine life, because oceans increase in size and temperature. A study conducted by National Geographic looking at 25 biodiverse areas (Caribbean Basin and the Cape Floristic Region in South Africa) showed that the amounts of carbon dioxide in these areas will increase. This could lead to the extinction of 56,000 plant species and 3,700 animal species in those areas alone, the study found (Gailliard).
3. **Introduction of (foreign) exotic species**: when a species not belonging to an ecosystem is introduced to a foreign environment, it causes damage to the bonds and rhythms of the ecosystem. In this way, the existing species and the introduced species will begin to fight over the (limited) resources available, turning into the “survival of the fittest”. This can lead to the endangerment of both competing species in question. An example of this scenario is the introduction of the Nile perch to Lake Victoria in the continent of Africa. According to Princeton University Press, the Nile perch was introduced in the 1950s and by the 1980s, a population boom of these fish contributed to the extinction of between 200 and 400 native fish species (Gailliard).
4. **Overexploitation**: The overharvesting of a plant or animal species. This has negative effects because it puts strain on a population and undermines their ability to reproduce the same numbers and puts the population of the certain area at risk of extinction (fish and medicinal plants are a great example of this). The Steller’s sea cow, which was discovered in 1741, shortly became extinct by 1768 due to overharvesting (Gailliard). Another species greatly affected by this is frogs, as they are often exploited as food, pet and scientific purposes (Gailliard).

In this graph, one can conclude that the populations of different species have been endangered and have risen to more than half of what it was a decade ago. Fish are most endangered (in 2019) with around 3 000 separate species being affected according to this graph. This is mostly due to overexploitation.



Retrieved from: https://www.statista.com/chart/17122/number-of-threatened-species-red-list/

iv. Major Countries and Organizations Involved

- Brazil: The Amazon rainforest is covered for the most part by Brazil. This forest is one of the most biodiverse places on the planet, unfortunately, it also has the highest extinction rate on the planet.
- Canada and Russia: covering most of the Arctic circles, climate change in these two countries is having an impact on Arctic and Northern biodiversity.
- Australia: the vast desert of Australia has unique biodiversity seen nowhere else on earth, unfortunately, great fires are causing rapid extinction rates.
- Major organizations are: *International Plant Convention*, *International Institute for Environment and Developmen*t and *Worldwide Wildlife Fund*. The main purpose of these organizations is to ensure fairness and justice for flora and fauna and species that are at risk of extinction.
    - Other organizations involved can be accessed through the link: https://environheroes.com/25-top-biodiversity-organizations-and-ngos/

v. Timeline of Events

1969: The National Environmental Policy Act (NEPA) is established. The core strategy of NEPA is to ensure that all levels of government give due consideration to the environment prior to any new federal decision that substantially affects the environment (Timetoast).

1973: The Endangered Species Act is implemented. The purpose of the Endangered Species Act is to conserve natural habitats and endangered species, as well as endangered species, that could possibly become extinct in the near future (Timetoast).

1975: Rainforest conservation commences. WWF's Tropical Rainforest Campaign was the first conservation campaign revolving around an entire biome rather than an individual species or a single habitat (Timetoast).

1980: First global sustainable development tactic. The World Conservation Plan, issued by WWF, IUCN and the United Nations Climate Program and approved by the UN Secretary-General, was the first text to combine conservation and sustainable use of natural resources (Timetoast).

1992: Community-based natural resource management. Launched by WWF and USAID, the LIFE project empowers remote Namibian populations to actively control their natural resources. Organized as conservation centres, citizens have legal rights to animals on their property, profit from their natural resources through tourism, and regulated hunting and other activities (Timetoast).

1992: William Rees introduces ecological footprint; 'Earth Summit' is held in Rio de Janeiro. The Convention on Biological Diversity signed, comes into force 1993 (OntarioTech).

2000: Millennium Development Goals. The eight Millennium Development Goals (MDGs) all target for 2015 are a blueprint decided upon by all the countries of the world and by all the world's leading development organizations. The 7th MDG in particular covers the issues regarding biodiversity (Timetoast).

2002: Large-scale initiative to save the Amazon. With the world's largest tropical forest facing major threats to deforestation, WWF has partnered with the Government of Brazil and other partners to initiate a 10-year plan to protect 12 per cent, or 60 million ha, of the Brazilian Amazon, home to 10 million different animal species. This is the biggest in-site preservation project in the world (Timetoast).

2005: World Summit. The 2005 World Summit, held at the Headquarters of the United Nations in New York, brought together more than 170 Heads of State and Government. It was a once-in-a-generation chance to take bold decisions in the areas of development, protection, human rights, as well as issues involving sustainability, such as biodiversity.

2010: The Nagoya Protocol implements the Convention on Biological Diversity and the Cartagena Protocol for biosafety. The objectives of the Convention are: the conservation of biological diversity, the sustainable use of its components, and the equal sharing of the benefits arising from the use of genetic resources (OntarioTech).

vi. Relevant UN Treaties and Events

The following conventions are from the United Nations Environment Treaty Collection:

8. a The Convention on Biological Diversity (in Rio de Janeiro, 5 June 1992): ensures that member states are conscious of the fundamental importance of biological diversity and of the natural, genetic, social, fiscal, technological, educational, cultural, recreational and esthetic qualities of biological diversity and its components. The convention does not disregard the consciousness that biodiversity is important in order to maintain life sustaining systems in the biosphere. The purpose of the convention is to allow biological diversity (CBD).

8. b Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (in Nagoya, 29 October 2010): an international agreement which aims to spread the advantages of using genetic resources in an equal manner. It came into effect on 12 October 2014, 90 days after the deposit of the fiftieth instrument of ratification. (CBD)

9. Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) (in New York, 17 March 1992): The goal of the Agreement is to encourage close coordination between the Parties with a view to obtaining and preserving a favorable conservation status for small cetaceans. The Conservation and Management Plan, as set out in the Annex to the Agreement, obliges

the Parties to participate in habitat conservation and maintenance, surveys and research, emissions reduction and public awareness. In order to accomplish its goal, ASCOBANS cooperates with Range States which have not yet accepted the Agreement with related inter-governmental organizations (JNCC).

11. Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora (in Lusaka, 8 September 1994): aims to minimize and eventually eradicate illegal trade in wild fauna and flora and to set up a permanent task force for this purpose. The agreement requires the parties to implement and enforce measures to investigate and prosecute cases of illicit trading, to collaborate with each other to provide specific information and science evidence, and to allow the public to detect illegal trade. The Parties further undertake to return any specimen of wild fauna and flora seized in the course of illicit trade to the country of origin (Ecolex).

vii. Main Issues

- Biological diversity, or simply biodiversity, is an aspect of society that multiple communities rely on, and eventually future generations as well. Humans are currently using 25% more natural resources that the planet can sustain. Consequently, diverse species and habitats are suffering from these direct threats (WWF).
- Biodiversity has a direct impact on our lives and with reduced biodiversity, millions will have to face a future with an irregular or short supply of resources such as food, fresh water, and will be more vulnerable to pests and diseases (WWF).
- According to the IUCN (International Union for Conservation of Nature), the monetary value of resources and services based on biodiversity, is estimated to be around 33 trillion USD per year (WWF).

- The issue is not only about money, but the loss of certain plant species may result in lack of modern and traditional medicine worldwide. Humans harvest around 50,000-70,000 plant species for medicine (WWF).
- Every year, around 100 million metric tonnes of aquatic life are taken from the wild, which is well over the amount that nature can sustain. Wild animal meat is an important food source in many countries, especially in areas of high poverty. Bushmeat hunting leads to the massive collapse in population sizes and as a result leads to species endangerment (Royal).

viii. Previous Attempts to Solve the Issue

Cloning is a controversial yet possible solution, with cloning DNA technology increasing over the last couple of years. Scientists have been able to clone animals from endangered species under certain circumstances. Although the technology is at the level yet for it to become a permanent solution, it would be capable of cloning on a massive scale in a couple of years if enough funds are given to research. This is not always an effective approach, as many people have ethical concerns, and that the animal kingdom should develop in a natural manner. Scientists have already begun the process of collecting and testing DNA material hoping that technology and public opinion will improve. Other methods similar to cloning are also available, such as artificial insemination, in-vitro fertilization and gene-editing. These technologies won't only help the specific species that is being cloned, it will also revitalize an entire ecosystem, this process is called "rewilding".

ix. Possible Solutions

- Artificial insemination: as stated previously, this method appears to be less popular due to moral concerns and is not technologically possible at a large scale. However, with growing research on the ethical aspect of this method could allow countries to start looking to technology for solutions.

- Implementing the issues of endangerment of species into education systems: this way, the public is more educated and prepared to take on the endangerment of their local species and work together to help animal and plant communities thrive in big cities and rural areas.
- Finding alternatives to pesticides and herbicides: they are well-known pollutants and affect plant growth and animal species that depend on said plants (namely bees, hummingbirds). Such alternatives include the “Beyond Pesticides” an NGO based in Washington DC, and is working towards the national transition from dangerous pesticides to alternative and more organic solutions (Beyond).
- Setting laws and regulations: the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) protects the survival of plants and animals and is an international agreement (Croteau). It looks at how countries should deal with endangered species nationally and if they are allowed to trade (and their limitations).
- Natural reserve areas: having more designated and protected areas for flora and fauna to thrive naturally without interference is an effective method. The United Nations Environment Programme World Conservation Monitoring Center (UNEP-WCMC) defines a protected area as "an area of land and/or sea especially dedicated to the protection of biological diversity and of natural and associated cultural resources, managed through legal or other effective means" (Croteau). In fact, this is already implemented internationally through provincial parks, natural reserves etc.

x. Bibliography

“Access Information on Multilateral Environmental Agreements.” InforMEA, 10 Dec. 1996, www.informea.org/en/treaties/lusaka-agreement#.

"ASCOBANS." JNCC, www.jncc.gov.uk/our-work/conservation-of-small-cetaceans-in-the-baltic-north-east-atlantic-irish-and-north-seas-ascobans/.

"Biodiversity and Ecosystems .:. Sustainable Development Knowledge Platform." United Nations, United Nations, www.sustainabledevelopment.un.org/topics/biodiversityandecosystems#.

CBD-Toolkit-Glossaries.pdf, CBD, www.cbd.int/cepa/toolkit/2008/doc/CBD-Toolkit-Glossaries.pdf .

"Convention on Biological Diversity." 5 June 1992. https://www.cbd.int/doc/legal/cbd-en.pdf.

Croteau, Emily, and Cy L. Mott. "Saving Endangered Species: A Case Study Using Global Amphibian Declines." Nature News, Nature Publishing Group, 2011, www.nature.com/scitable/knowledge/library/saving-endangered-species-a-case-study-using-19445898/.

EHEditor, Author. "25 Top Biodiversity Organizations and NGOs." *EnvironHeroes*, 12 July 2020, https://environheroes.com/25-top-biodiversity-organizations-and-ngos/

"How Does Biodiversity Loss Affect Me and Everyone Else?" WWF, www.wwf.panda.org/discover/our_focus/biodiversity/biodiversity_and_you/#.

J., Ripple William, et al. "Bushmeat Hunting and Extinction Risk to the World's Mammals." Royal Society Open Science, 1 Oct. 2016, www.royalsocietypublishing.org/doi/10.1098/rsos.160498.

Kazmeyer, Milton. “What Human Activities Have a Negative Impact on the Ocean?” Sciencing, 2 Mar. 2019, https://sciencing.com/human-activities-negative-impact-ocean-17206.html

Lusaka Agreement on Co-Operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora, www.ecolex.org/details/treaty/lusaka-agreement-on-co-operative-enforcement-operations-directed-at-illegal-trade-in-wild-fauna-and-flora-tre-001197/.

“The Nagoya Protocol - Convention on Biological Diversity.” Department of Agriculture, Water and the Environment, www.environment.gov.au/science-and-research/australias-biological-resources/nagoya-protocol-convention-biological.

“Timeline of Sustainable Development (Emergence of Anthropocene).” Sustainability Today, www.sites.ontariotechu.ca/sustainabilitytoday/urban-and-energy-systems/sustainable-development/timeline-of-sustainable-development.php.

“UN, United Nations, UN Treaties, Treaties.” United Nations, United Nations, www.treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-8&chapter=27&clang=_en.

UNESCO. “Learning to Protect Biodiversity.” *YouTube*, YouTube, 30 Aug. 2012, www.youtube.com/watch?v=kHhspf5IfdE.

Unit, Biosafety. “The Nagoya Protocol on Access and Benefit-Sharing.” Convention on Biological Diversity, Secretariat of the Convention on Biological Diversity, 3 Dec. 2020, www.cbd.int/abs/.