



WORLDLIFE FUND

AGENDA ITEM: LOSS OF BIODIVERSITY IN EXTINCTION

SUBTOPIC:PARIS CLIMATE AGREEMENT

CHAIR BOARD MEMBERS: DEFNE BALAY, LEYLA BENER

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LETTERS FROM CHAIRS

Esteemed delegates,

I would like to start by welcoming you all to the fourth annual session of TBMUN, in an entirely online format. My name is Defne Balay. I am the Deputy Secretary General of TBMUN 2021 also the President Chair of the WWF committee. During the two days of the conference, I will be honoured to conduct the WWF committee with you fellow delegates with the help of my beloved Vice Chair Leyla Bener.

During these unprecedented times, the spirit of Model United Nations has never been this much value to our world. From pandemics to global warming and climate change, the hardships our world is facing undoubtedly requires international cooperation and collaboration. Ever since our establishment in 2018, we have been pursuing the goal of enriching and enlightening the young minds with international politics. Despite the handicaps, we will continue moving forward in our mission, because this year, our world needs these young minds more than ever.

Unfortunately, the only safe way to establish this important dialogue between young minds is doing so in a virtual format. The conference, including the formal and informal committee sessions, will be conducted via Zoom. As with the previous iterations, the procedure of our conference will be based on the Harvard MUN procedure. This year, our academic and organization teams devoted months to properly convert the indispensable traditions of Model United Nations into an online environment, aiming to appropriately facilitate the Harvard MUN procedure. In light of our efforts, we are excited by the innovations demanded by this unique iteration of the conference. In order to make use of these innovations, our academic team prepared four unique committees, including a Junior committee, to touch base with the core issues recurring for a long time. Each individual committee will endorse the future diplomats of today in order to have them resolve the longstanding conflicts via diplomatic negotiations. If you have any questions about the committee do not hesitate to contact me via defne.balay.05@gmail.com.

Best regards,

Defne Balay

The Deputy Secretary General of TBMUN 2021

The President Chair of WWF Committee

Dear distinguished delegates,

Welcome all, to our first ever online MUN, we are more than delighted to have you once again at a TBMUN conference. I am Leyla Bener, I'll be your Vice Chair. With the leadership of my friend and your Chair Defne Balay we will be guiding you throughout the committee. Though we will attend through Zoom, this shouldn't interfere with our efficiency in our conference. Online MUN connects people who might not have been able to attend one on one, delegates who possibly wouldn't have met in real life. Also, it allows for a greater frequency for committees to meet and create.

2020-2021 has altered our life circumstances in ways we could never imagine. From the Coronavirus, to global warming issues worsening by the minute. Innocent animals were trapped in fires, an immense amount of biodiversity was annihilated. We can't describe the insignificance these calamities hold in our daily and future lives. Therefore, we as a team wanted to depict a topic which needed to be argued upon. That's why this year in the committee of WWF we will be discussing a present issue, biodiversity loss.

Although we are facing countless predicaments, this conference should show our resilience during these tough times. Every action you take in the committee will demand diplomacy and creativity. With your corporation along with your goodwill you will tackle your goals and ultimately write your resolutions. I endorse each delegate to speak and make new friends, every opinion should be recognized. Hoping that this experience will benefit each and everyone of you, I wish you all an efficient conference!

**Sincerely,
Leyla Bener
Crisis team member
Vice Chair of WWF Committee**

PREFACE

Hello, delegates! This is the study guide for TBMUN 2021, WWF Committee. MUN (Model United Nations) is a high school simulation of the United Nations (UN). MUN seeks to teach civics, constructive communication, globalization, and multilateral diplomacy to participants. MUN allows students to act as "delegates" from UN Member States and take part in mock UN committees. They not only become involved and discuss today's pressing issues because of this encounter and make new friends. It is an international global phenomenon, being a widespread extra-curricular activity with a solid tradition and community in many countries.

Although it is important to know the Rules of Procedure, how to write a Draft Resolution or Working Paper, in the end delegates need to keep in mind they will be discussing a topic, a substantive issue. Therefore, delegates should understand that it demands prior research and knowledge not of the workings of MUN itself, but also of the topic being discussed. This document is meant to help delegates and provide guidance on how to approach the topic for loss of biodiversity in extinction and Paris Climate Agreement.

This study guide begins with an introduction to the committee and to the topic of the debate you will be discussing. You will gain insight on some historical and current situations, as well as some guidance towards the different possible approaches. As such, you should read it with close attention, so that you know the directions that the debate might take. Having that said, please remember to, above all else, enjoy yourself during the TBMUN, to have fun and to meet new people!

ABOUT WWF

All around the world, people are waking up to the deepening crisis of nature loss. WWF is experiencing a growing realization that nature is our life-support system and that no one will be spared from the impacts of its loss. Here at WWF, an independent conservation organization active in nearly 100 countries, we are working to sustain the natural world for the benefit of people and wildlife. They are part of a growing alliance calling on world leaders to set nature on the path to recovery by 2030, a New Deal for Nature and People as comprehensive as the global climate deal. Working with many others, from individuals and communities to business and government, WWF urgently seeks to protect and restore natural habitats, stop the mass extinction of wildlife, and make the way we produce and consume sustainable.

AGENDA 1: LOSS OF BIODIVERSITY IN EXTINCTION

DETAILED BACKGROUND OF THE ISSUE

Earth's ecosystems have evolved for millions of years, resulting in diverse and complex biological communities living in balance with their environment. Since the 16th century, human activity has impacted nature in practically every part of the world, wild plants and animals are at risk of extinction, deforestation and land degradation are causing water scarcity and erosion, and climate change leads to acidification of oceans. Biodiversity loss is the extinction of species (plant or animal) worldwide, and also the local reduction or loss of species in a certain habitat. Over the past 50 years, humans have changed ecosystems more rapidly than ever before; 60% of ecosystems are degraded and often over-exploited, and pressures on nature are increasing despite the growing number of responses to tackle biodiversity loss.

Nature and its contributions to people are fundamental to the existence of humans as a species and for our societies and their future development. Nature and its contributions to people are, however, continuing to decline, largely because of human actions. Of 2,493 species assessed in Europe and Central Asia, 13% are included on the Red List of Threatened Species of the International Union for Conservation of Nature (IUCN), which constitutes 6.5% of the total number of the species included on the IUCN Red List of Threatened Species, globally. The biodiversity of an area is literally the number of species, both plant and animal, inhabiting the environment being examined. When a species is no longer found in a region, it is locally extinct. When it is no longer found anywhere, the species is considered extinct. Species diversity ensures ecosystem resilience, giving ecological communities the scope they need to withstand stress.

Thus while conservationists often justifiably focus their efforts on species, rich ecosystems like rainforests and coral reefs. Which have a lot to lose, a comprehensive strategy for saving biodiversity must also include habitat types with fewer species, like grasslands, tundra, and polar seas, for which any loss could be irreversibly devastating. And while much concern over extinction focuses on globally lost species, most of biodiversity's benefits take place at a local level, and conserving local populations is the only way to ensure genetic diversity critical for a species' long term survival.

EVERY TAXON IN TROUBLE

Amphibians: No group of animals has a higher rate of endangerment than amphibians. Scientists estimate that a third or more of all the roughly 6,300 known species of amphibians are at risk of extinction. Frogs, toads, and salamanders are disappearing because of habitat loss, water and air pollution, climate change, ultraviolet light exposure, introduced exotic species, and disease. Because of their sensitivity to environmental changes, vanishing amphibians should be viewed as the canary in the global coal mine, signaling subtle yet radical ecosystem changes that could ultimately claim many other species, including humans.

Birds: Birds occur in nearly every habitat on the planet and are often the most visible and familiar wildlife to people across the globe. As such, they provide an important indicator for tracking changes to the biosphere. Declining bird populations across most to all habitats confirm that profound changes are occurring on our planet in response to human activities. A 2009 report on the state of birds in the United States found that 251 (31 percent) of the 800 species in the country are of conservation concern. Globally, BirdLife International estimates that 12 percent of known 9,865 bird species are now considered threatened, with 192 species, or 2 percent, facing an “extremely high risk” of extinction in the wild—two more species than in 2008. Habitat loss and degradation have caused most of the bird declines, but the impacts of invasive species and capture by collectors play a big role, too.

Fish: Increasing demand for water, the damming of rivers throughout the world, the dumping and accumulation of various pollutants, and invasive species make aquatic ecosystems some of the most threatened on the planet; thus, it's not surprising that there are many fish species that are endangered in both freshwater and marine habitats. The American Fisheries Society identified 700 species of freshwater or anadromous fish in North America as being jeopardized, amounting to 39 percent of all such fish on the continent. In North American marine waters, at least 82 fish species are imperiled. Across the globe, 1,851 species of fish, 21 percent of all fish species evaluated, were deemed at risk of extinction by the IUCN (The International Union for Conservation of Nature) in 2010, including more than a third of sharks and rays.

Invertebrates: Invertebrates, from butterflies to mollusks to earthworms to corals are vastly diverse, and though no one knows just how many invertebrate species exist. They're estimated to account for about 97 percent of the total species of animals on Earth. Of the 1.3 million known invertebrate species, the IUCN (The International Union for Conservation of

Nature) has evaluated about 9,526 species, with about 30 percent of the species evaluated at risk of extinction. Freshwater invertebrates are severely threatened by water pollution, groundwater withdrawal, and water projects, while a large number of invertebrates of notable scientific significance have become either endangered or extinct due to deforestation, especially because of the rapid destruction of tropical rainforests. In the ocean, reef-building corals are declining at an alarming rate: 2008's first ever comprehensive global assessment of these animals revealed that a third of reef-building corals are threatened.

Mammals: Perhaps one of the most striking elements of the present extinction crisis is the fact that the majority of our closest relatives, the primates, are severely endangered. About 90 percent of primates, the group that contains monkeys, lemurs, lorids, galagos, tarsiers, and apes (as well as humans) live in tropical forests, which are fast disappearing. The IUCN estimates that almost 50 percent of the world's primate species are at risk of extinction. Overall, the IUCN (The International Union for Conservation of Nature) estimates that half the globe's 5,491 known mammals are declining in population and a fifth are clearly at risk of disappearing forever with no less than 1,131 mammals across the globe classified as endangered, threatened, or vulnerable. In addition to primates, marine mammals, including several species of whales, dolphins, and porpoises are among those mammals slipping most quickly toward extinction.

Plants: Through photosynthesis, plants provide the oxygen we breathe and the food we eat and are thus the foundation of most life on Earth. They're also the source of a majority of medicines in use today. Of the more than 300,000 known species of plants, the IUCN (The International Union for Conservation of Nature) has evaluated only 12,914 species, finding that about 68 percent of evaluated plant species are threatened with extinction. Unlike animals, plants can't readily move as their habitat is destroyed, making them particularly vulnerable to extinction. Indeed, one study found that habitat destruction leads to an "extinction debt," whereby plants that appear dominant will disappear over time because they aren't able to distribute to new habitat patches. Global warming is likely to substantially increase this problem. Already, scientists say, warming temperatures are causing quick and dramatic changes in the range and distribution of plants around the world. With plants making up the backbone of ecosystems and the base of the food chain, that's very bad news for all species, which depend on plants for food, shelter, and survival.

Reptiles: Globally, 21 percent of the total evaluated reptiles in the world are considered endangered or vulnerable to extinction by the IUCN (The International Union for Conservation of Nature) -594 species- while in the United States, 32 reptile species are at risk, about 9 percent of the total. The main threats to reptiles are habitat destruction and the invasion of nonnative species, which prey on reptiles and compete with them for habitat and food.

THREATS TO BIODIVERSITY

Alteration and loss of the habitats: The transformation of the natural areas determines not only the loss of flora, but also a decrease in the animal species associated with them. One of the largest drivers of habitat loss in the tropics is palm oil, and can have a profound impact on wildlife

Introduction of exotic species and genetically modified organisms: Species originating from a particular area, introduced into new natural environments can lead to different forms of imbalance in the ecological equilibrium.

Pollution: Human activity influences the natural environment producing negative, direct or indirect, effects that alter the flow of energy, the chemical and physical constitution of the environment and abundance of the species.

Climate change: Heating of the Earth's surface affects biodiversity because it endangers all the species that are adapted to the cold or the altitude. With expanded droughts and excessive rainfall in certain areas, species are likely to be impacted directly or indirectly through factors like expanded vector ranges which can introduce infectious diseases.

In a potentially devastating web of interactions, climate change could wipe-out a third of parasites making them one of the most threatened groups on the planet. This may sound wonderful until you realize that the loss of parasites could lead to complicated ecosystem break-downs. Species previously kept in check by parasitism would now be suddenly released from selection pressures and grow unabated, or unpredictable invasions of surviving parasites could break-free into new areas.

Overexploitation of resources: When activities connected with capturing and harvesting (hunting, fishing, farming) a renewable natural resource in a particular area is excessively intense, the resource itself may become exhausted, as for example, is the case of sardines, herrings, cod, tuna and many other species that humans capture without leaving enough time for the organisms to reproduce.

Certain groups are bound to be impacted more than others. No group of animals has a higher rate of endangerment than amphibians. Scientists estimate that a third or more of all the roughly 6,300 known species of amphibians are at risk of extinction. Frogs, toads, and salamanders are disappearing because of habitat loss, water and air pollution, climate change, ultraviolet light exposure, introduced exotic species, and disease. Because of their sensitivity to environmental changes, vanishing amphibians should be viewed as the canary in the global coal mine, signaling subtle yet radical ecosystem changes that could ultimately claim many other species, including humans.

Birds occur in nearly every habitat on the planet and are often the most visible and familiar wildlife to people across the globe. As such, they provide an important indicator for tracking changes to the biosphere. Declining bird populations across most to all habitats confirm that profound changes are occurring on our planet in response to human activities.

60% of primate species are now threatened with extinction and 75% have declining populations. Overall, the IUCN (The International Union for Conservation of Nature) estimates that half the globe's 5,491 known mammals are declining in population and a fifth are clearly at risk of disappearing forever with no less than 1,131 mammals across the globe classified as endangered, or vulnerable.

A new study out, shows that just four countries - Brazil, Madagascar, Indonesia, and the Democratic Republic of the Congo (DRC), harbor 65% of the world's primate species (439) and 60% of these primates are Threatened, Endangered, or Critically Endangered. Habitat loss and fragmentation are major threats to primates in Brazil, Madagascar, and Indonesia. However, in DRC hunting for the commercial bushmeat trade is the primary threat. Encroachment on primate habitats driven by local and global market demands for food and non-food commodities hunting, illegal trade, the reproduction of invasive species, and human and domestic animal borne infectious diseases cause habitat loss, population declines, and extirpation. Modeling agricultural expansion in the 21st century for the four countries under a worst case-scenario, showed a primate range contraction of 78% for Brazil, 72% for Indonesia, 62% for Madagascar, and 32% for DRC. Primates in Brazil and Madagascar have 38% of their range inside protected areas, 17% in Indonesia and 14% in DRC, suggesting that the great majority of primate populations remain vulnerable.

Natural Biodiversity Loss

An area's biodiversity increases and decreases with natural cycles. Seasonal changes, such as the onset of spring, create opportunities for feeding and breeding, increasing biodiversity as the populations of many species rise. In contrast, the onset of winter temporarily decreases an area's biodiversity, as warm-adapted insects die and migrating animals leave. In addition, the seasonal rise and fall of plant and invertebrate populations (such as insects and plankton), which serve as food for other forms of life, also determine an area's biodiversity.

Natural ecological disturbances, such as wildfire, floods, and volcanic eruptions, change ecosystems drastically by eliminating local populations of some species and transforming whole biological communities. Such disturbances are temporary, however, because natural disturbances are common and ecosystems have adapted to their challenges (see also ecological succession).

Human-Driven Biodiversity Loss

In contrast, biodiversity losses from disturbances caused by humans are more severe and longer-lasting. Humans, their crops, and their food animals take up an increasing share of Earth's land area. Half of the world's habitable land has been converted to agriculture, and some 77 percent of agricultural land is used for grazing by cattle, sheep, goats, and other livestock. This massive conversion of forests, wetlands, grasslands, and other terrestrial ecosystems has produced a 60 percent decline (on average) in the number of vertebrates worldwide since 1970, with the greatest losses in vertebrate populations occurring in freshwater habitats (83 percent) and in South and Central America (89 percent). Between 1970 and 2014 the human population grew from about 3.7 billion to 7.3 billion people. By 2018 the biomass of humans and their livestock (0.16 gigaton) outweighed the biomass of wild mammals (0.007 gigaton) and wild birds (0.002 gigaton). Researchers estimate that the current rate of species loss varies between 100 and 10,000 times the background extinction rate (which is roughly one to five species per year when the entire fossil record is considered). In addition, a 2019 report by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services noted that up to one million plant and animal species are facing extinction due to human activities.

Forest clearing, wetland filling, stream channeling and rerouting, and road and building construction are often part of a systematic effort that produces a substantial change in the ecological trajectory of a landscape or a region. As human populations grow, adapt the landscape to human settlement, and create opportunities for trading with other communities for the purposes of building wealth. Biodiversity losses typically accompany these processes.

Ecologists emphasize that habitat loss (typically from the conversion of forests, wetlands, grasslands, and other natural areas to urban and agricultural uses) and invasive species are the primary drivers of biodiversity loss, but they acknowledge that climate change could become a primary driver as the 21st century progresses. In an ecosystem, species tolerance limits and nutrient cycling processes are adapted to existing temperature and precipitation patterns. Some species may not be able to cope with environmental changes from global warming. These changes may also provide new opportunities for invasive species, which could further add to the stresses on species struggling to adapt to changing environmental conditions. All five drivers are strongly influenced by the continued growth of the human population and its consumption of natural resources.

Interactions between two or more of these drivers increase the pace of biodiversity loss. Fragmented ecosystems are generally not as resilient as contiguous ones, and areas clear-cut for farms, roads, and residences provide avenues for invasions by non-native species, which contribute to further declines in native species. Habitat loss combined with hunting pressure is hastening the decline of several well-known species, such as the Bornean orangutan, which could become extinct by the middle of the 21st century. Hunters killed 2,000–3,000 Bornean orangutans every year between 1971 and 2011, and the clearing of large areas of tropical forest in Indonesia and Malaysia for oil palm cultivation became an additional obstacle to the species' survival. Palm oil production increased 900 percent in Indonesia and Malaysia between 1980 and 2010, and, with large areas of Borneo's tropical forests cut, the Bornean orangutan and hundreds to thousands of other species have been deprived of habitat.

Ecological Effects

The weight of biodiversity loss is most pronounced on species whose populations are decreasing. The loss of genes and individuals threatens the long-term survival of a species, as mates become scarce and risks from inbreeding rise when closely related survivors mate. The total loss of populations also increases the risk that a particular species will become extinct.

Biodiversity is critical for maintaining ecosystem health. Declining biodiversity lowers an ecosystem's productivity (the amount of food energy that is converted into the biomass) and lowers the quality of the ecosystem's services.

Biodiversity loss also threatens the structure and proper functioning of the ecosystem. Although all ecosystems are able to adapt to the stresses associated with reductions in biodiversity to some degree, biodiversity loss reduces an ecosystem's complexity, as roles

once played by multiple interacting species or multiple interacting individuals are played by fewer or none. As parts are lost, the ecosystem loses its ability to recover from a disturbance (see ecological resilience). Beyond a critical point of species removal or diminishment, the ecosystem can become destabilized and collapse. That is, it ceases to be what it was and undergoes a rapid restructuring, becoming something else .

Reduced biodiversity also creates a kind of “ecosystem homogenization” across regions as well as throughout the biosphere. Specialist species are often the most vulnerable to dramatic population declines and extinction when conditions change. On the other hand, generalist species (those adapted to a wide variety of habitats, food resources, and environmental conditions) and species favoured by human beings become the major players in ecosystems vacated by specialist species. As specialist species and unique species (as well as their interactions with other species) are lost across a broad area, each of the ecosystems in the area loses some amount of complexity and distinctiveness, as the structure of their food chains and nutrient-cycling processes become increasingly similar.

Economic And Societal Effects

Biodiversity loss affects economic systems and human society. Humans rely on various plants, animals, and other organisms for food, building materials, and medicines, and their availability as commodities is important to many cultures. The loss of biodiversity among these critical natural resources threatens global food security and the development of new pharmaceuticals to deal with future diseases. Simplified, homogenized ecosystems can also represent an aesthetic loss.

Economic scarcities among common food crops may be more noticeable than biodiversity losses of ecosystems and landscapes far from global markets. For example, Cavendish bananas are the most common variety imported to nontropical countries, but scientists note that the variety’s lack of genetic diversity makes it vulnerable to Tropical Race (TR), a fusarium wilt fungus which blocks the flow of water and nutrients and kills the banana plant. Experts fear that TR4 may drive the Cavendish banana to extinction during future disease outbreaks. Some 75 percent of food crops have become extinct since 1900, largely because of an overreliance on a handful of high-producing crop varieties. This lack of biodiversity among crops threatens food security, because varieties may be vulnerable to disease and pests, invasive species, and climate change. Similar trends occur in livestock production, where high-producing breeds of cattle and poultry are favoured over lower-producing, wilder breeds.

Mainstream and traditional medicines can be derived from the chemicals in rare plants and animals, and thus lost species represent lost opportunities to treat and cure. For example, several species of fungi found on the hairs of three-toed sloths produce medicines effective against the parasites that cause malaria and Chagas disease as well as against human breast cancer.

WHO IS, AND WILL BE, HARDEST HIT BY BIODIVERSITY LOSS?

The highest rates of biodiversity loss are currently in the tropics, although historically there has been extensive biodiversity loss in temperate zones. More recently, however, the 2018 Living Planet Report finds that declines in vertebrate populations since the 1970s are

greatest in Latin America and the Caribbean, where abundance has declined by 89 percent between 1970 and 2014.⁴ Comparable figures from other regions are a 64 percent decline in the Indo-Pacific region, and 56 percent in Sub-Saharan Africa, 31 percent in the 'palearctic' realm (Europe, Middle East, North Africa, Central Asia) and 21 percent in North America. Tropical forests are one of the most diverse types of ecosystem on the planet but include major hotspots for biodiversity loss. Drylands too are being rapidly degraded, risking much biodiversity loss. These regions of high biodiversity loss coincide substantially with areas of high poverty and those likely to be hardest hit by climate change. Drylands, for example, support over 30 percent of the global human population including nearly half a billion people who are chronically poor.

The ecological functions and services that biodiversity supports are critical to human wellbeing globally, so all of humanity will ultimately be affected by the degradation of nature and biodiversity loss. More immediately and directly however it is poor rural communities in developing countries who are the most dependent on nature to meet their day-to-day livelihood needs. To illustrate this point, the TEEB (The Economics of Ecosystems and Biodiversity) came up with the concept of 'GDP (Gross Domestic Product) of the poor'. Using India as a case study, they showed that the value of forest services, such as fresh water, soil nutrients and non-timber forest products [NTFPs(National Freelance Training Program)], to national GDP was approximately 7 percent. However, if the contribution of forest services to poor people only was calculated, it was more like 57 percent of GDP.

Megadiverse countries:

17 countries which have been identified as the most biodiversity-rich countries of the world, with a particular focus on endemic biodiversity: United States of America, Mexico, Colombia, Ecuador, Peru, Venezuela, Brazil, Democratic Republic of Congo, South Africa, Madagascar, India, Malaysia, Indonesia, Philippines, Papua New Guinea, China, and Australia.

While there is no specific management associated with this concept, 17 countries rich in biological diversity and associated traditional knowledge have formed a group known as the Like Minded Megadiverse Countries. These include 12 of the above identified Megadiverse Countries. This group was formed in 2002 under the Cancun Declaration to act as a mechanism of cooperation on the conservation of biological diversity and traditional knowledge.

- The biodiversity of each and every nation is critically important to that nation's survival, and must be a fundamental component of any national or regional development strategy.

- Biodiversity is by no means evenly distributed on our planet, and some countries, especially in the tropics, harbour far greater concentrations of biodiversity than others.

- Some of the most species rich and biodiverse nations also have ecosystems that are under the most severe threat.

- To achieve maximum impact with limited resources, conservation efforts must concentrate heavily (but not exclusively) on those countries richest in diversity and endemism and most severely threatened; resources invested in them for conservation should be roughly proportional to their overall contribution to global biodiversity.

Legal and compliance – Since this is a country-focused biodiversity prioritisation approach, mainly to raise awareness, there is no legal protection or compliance associated with the designation itself. The legal and compliance requirements present within these countries will relate to other designations of biodiversity importance present within each country, such as legally protected areas.

Biodiversity importance – These countries are of global biodiversity value based on the number and the level of unique species present. However, these countries all contain areas of high biodiversity importance as well as degraded land and urban areas. Detailed information is needed on the distribution of biodiversity within these countries for site-scale assessment and decision making.

Socio-cultural values – As these countries include a variety of human land-uses, rural and urban, as well as protected areas under a range of possible governance types, many social and/or cultural values are likely to be present in some parts.

HOW MANY SPECIES ARE THREATENED WITH THE EXTINCTION?

12,259 species are known by IUCN, the World Conservation Body, to be threatened with extinction. IUCN keeps the world's inventory of the conservation status of animals and plants, compiling data from thousands of scientists and conservationists worldwide. However, the 12,259 threatened species are only the tip of the iceberg. Nobody knows how many species there are on Earth, let alone how they are doing. The total number of recorded living species is around 1.75 million. But more than two thirds are insects and other invertebrates, which are extremely difficult to monitor. An estimate of the real number of species on Earth is 14 million.

For its 2003 "Red List of Threatened Species", IUCN was able to evaluate the conservation status of 2% of 1.53 million species for which it has descriptions. The only two well-monitored groups are birds and mammals, so IUCN was able to evaluate 100% of birds and 99% of mammals for threatened status.

The continent of Europe is estimated to be home to more than 200,000 animal and plant species. These are relatively small numbers compared with other regions of the world, but the proportion of threatened species is far higher.

Western Europe's population density and level of industrialisation have seriously impaired biodiversity.

-The two well-monitored groups of the world's animals are mammals and birds. Currently, every fourth (24%) mammal and every eighth bird (12%) is facing a high risk of extinction.

-Threatened mammals include African and Asiatic lions, orang-utans, tigers, Chinese alligators. In Europe: the European mink, the Arctic fox, various types of squirrels and lizards, and all European dolphins, seals and whales.

-The most endangered big cat in the world is the Iberian lynx. Once common in Spain and Portugal, there are only a few hundred left, which live in a few isolated pockets in Spain.

-Across the European continent, 42% of mammals are threatened, 15% of birds, 45% of butterflies, 30% of amphibians, 45% of reptiles and 52% of freshwater fish.

HOW ARE ECOSYSTEMS DOING?

Ecosystems are self-regulating communities of plants and animals interacting with each other and with their nonliving environment forests, wetlands, mountains, lakes, rivers, deserts and agricultural landscapes. Ecosystems are vulnerable to interference as pressure on one component can upset the whole balance. They are also very vulnerable to pollution. Many ecosystems have already been lost, and many others are at risk.

The world's forests house about half of global biodiversity. But they are disappearing at a rate of 0.8% per year. Tropical forests are vanishing at an annual rate of 4%.

- The EU has lost more than half of its once so biodiverse and species-rich wetlands.

- Up to a third of the world's coral reefs have already perished and another third is under threat.

- Only 10% of the world's biodiverse areas and 1% of the world's oceans are protected, sometimes not very effectively.

SUBTOPIC: PARIS CLIMATE AGREEMENT

WHAT IS THE PARIS AGREEMENT?

The Paris Agreement is a landmark international accord that was adopted by nearly every nation in 2015 to address climate change and its negative impacts. The agreement aims to substantially reduce global greenhouse gas emissions in an effort to limit the global temperature increase in this century to 2 degrees Celsius above pre industrial levels, while pursuing the means to limit the increase to 1.5 degrees. The agreement includes commitments from all major emitting countries to cut their climate pollution and to strengthen those commitments over time. The pact provides a pathway for developed nations to assist developing nations in their climate mitigation and adaptation efforts, and it creates a framework for the transparent monitoring, reporting, and ratcheting up of countries' individual and collective climate goals.

How Many Countries Are in the Paris Agreement?

Since 2015, 197 countries ,nearly every nation on earth, with the last signatory being war-torn Syria-have endorsed the Paris Agreement. Of those, 190 have solidified their support with formal approval. The major emitting countries that have yet to formally join the agreement are Iran, Turkey, and Iraq.

Paris Agreement Summary

The 32-page document establishes a framework for global climate action, including the mitigation of and adaptation to climate change, the transparent reporting and strengthening of climate goals, and support for developing nations. Here's what it aims to do:

Limit global temperature rise by reducing greenhouse gas emissions

In an effort to "significantly reduce the risks and impacts of climate change," the accord calls for limiting the global average temperature rise in this century to well below 2 degrees Celsius, while pursuing efforts to limit the temperature rise to 1.5 degrees. It also asks countries to work to achieve a leveling off of global greenhouse gas emissions as soon as

possible and to become greenhouse gas emissions neutral in the second half of this century. In 2018, the IPCC's (Intergovernmental Panel on Climate Change) Special Report: Global Warming at 1.5 Degrees Celsius concluded the difference between 1.5 and 2 degrees Celsius could mean substantially more poverty, extreme heat, sea level rise, habitat loss, and drought. To achieve the Paris Agreement's original objectives, 186 countries-responsible for more than 90 percent of global emissions-submitted carbon reduction targets, known as "intended nationally determined contributions" (INDCs), prior to the Paris conference. These targets outlined each country's commitments for curbing emissions (including through the preservation of carbon sinks) through 2025 or 2030, including economy-wide carbon-cutting goals. INDCs turn into NDCs (Nationally determined contributions) nationally determined contributions- once a country formally joins the agreement. There are no specific requirements about how or how much countries should cut emissions, but there have been political expectations about the type and stringency of targets by various countries based on the latest science. As a result, national plans vary greatly in scope and ambition, largely reflecting each country's capabilities, its level of development, and its contribution to emissions over time. China, for example, committed to leveling off its carbon emissions no later than 2030. India set its sights on cutting emissions intensity by 33 to 35 percent below 2005 levels and generating 40 percent of its electricity from non-fossil fuel sources by 2030.

The United States, the world's largest historical emitter and the second-biggest current emitter after China, had committed to cutting overall greenhouse gas emissions by 26 to 28 percent below 2005 levels by 2025. U.S. initiatives to achieve the target include the Clean Power Plan (a state-by-state program to cut carbon pollution from the power sector) and the tightening of automotive fuel economy standards to reduce transportation emissions both policies the Trump administration fought hard to roll back and which the Biden/Harris administration has committed to strengthening.

Provide a framework for transparency, accountability, and the achievement of more ambitious targets

The Paris Agreement includes a series of mandatory measures for the monitoring, verification, and public reporting of progress toward a country's emissions-reduction targets. The enhanced transparency rules apply common frameworks for all countries, with accommodations and support provided for nations that currently lack the capacity to strengthen their systems.

Among other requirements, countries must report their greenhouse gas inventories and progress relative to their targets, allowing outside experts to evaluate their success. Countries are also expected to revisit their pledges and put forward progressively stronger targets every five years, with the goal of further driving down emissions. Nations must participate in a "global stocktake" to measure collective efforts toward meeting the Paris Agreement's long-term goals as well. Meanwhile, developed countries also have to estimate how much financial assistance they'll allocate to developing nations to help them reduce emissions and adapt to the impacts of climate change.

These transparency and accountability provisions are similar to those in the frameworks of other international agreements. While the system doesn't include financial penalties, the requirements are aimed at making the progress of individual nations easy to track and fostering a sense of global peer pressure, discouraging any dragging of feet among countries that may consider doing so.

Mobilize support for climate change mitigation and adaptation in developing nations

Recognizing that many developing countries and small island nations that have contributed the least to climate change could suffer the most from its consequences, the Paris Agreement includes a plan for developed countries, and others “in a position to do so, to continue to provide financial resources to help developing countries mitigate and increase resilience to climate change. For instance, India’s pledge includes the need to eradicate poverty in parallel with decreasing emissions and increasing renewable energy, such as addressing energy poverty and access in remote villages that rely on diesel generators. With technological and financial help from wealthier countries, important equity-focused goals such as these can be within reach. The Paris Agreement builds on the financial commitments of the 2009 Copenhagen Accord, which aimed to scale up public and private climate finance for developing nations to \$100 billion a year by 2020. The Copenhagen pact also created the Green Climate Fund to help mobilize transformational private finance using targeted public dollars. The Paris Agreement established the expectation that the world would set a higher annual goal by 2025 to build on the \$100 billion target for 2020 and would put mechanisms in place to achieve that scaling up. Unfortunately, collective contributions continue to fall short, reaching approximately \$79 billion in 2019.

While developed nations are not legally bound to contribute a specific amount to the mitigation and adaptation efforts of developing countries, they are encouraged to provide financial support and are required to report on the financing they supply or will mobilize.

Why Is the Paris Agreement Important?

Rarely is there consensus among nearly all nations on a single topic. But with the Paris Agreement, leaders from around the world collectively agreed that climate change is driven by human behavior, that it’s a threat to the environment and all of humanity, and that global action is needed to stop it. It also created a clear framework for all countries to make emissions reduction commitments and strengthen those actions over time. Here are some key reasons why the agreement is so important:

Human-generated emissions cause global warming

Carbon dioxide, nitrous oxide, and methane are gases that collect in the atmosphere and prevent heat from radiating from earth’s surface into space, creating what’s known as the greenhouse effect. According to the Intergovernmental Panel on Climate Change (IPCC), the leading international scientific body studying the subject, the concentration of these heat-trapping gases has increased substantially since preindustrial times to levels not seen in at least 800,000 years. Carbon dioxide (the chief contributor to climate change) is up by 40 percent, nitrous oxide by 20 percent, and methane by a whopping 150 percent since 1750, mainly from the burning of dirty fossil fuels. The IPCC says it’s “extremely likely” that these emissions are mostly to blame for the rise in global temperatures since the 1950s. Meanwhile, deforestation and forest degradation have contributed significantly to global carbon emissions as well.

Global warming threatens climate systems

Hotter temperatures-both on land and at sea-alter global weather patterns and change how and where precipitation falls. Those shifting patterns exacerbate dangerous and deadly drought, heat waves, floods, wildfires, and storms, including hurricanes. They also melt ice

caps, glaciers, and layers of permafrost, which can lead to rising sea levels and coastal erosion. Warmer temperatures impact whole ecosystems as well, throwing migration patterns and life cycles out of whack. For example, an early spring can induce trees and plants to flower before bees and other pollinators have emerged. While global warming may equate to longer growing seasons and higher food production in some regions, areas already coping with water scarcity are expected to become drier, creating the potential for drought, failed crops, or wildfires.

Climate change endangers human health

As climate change fuels temperature increases and extreme weather events, it jeopardizes our air, water, and food; spreads disease; and imperils our homes and safety. We are confronting a growing public health crisis.

- Extreme heat contributes directly to cardiovascular deaths and respiratory disease. In the Indian city of Ahmedabad, for example, more than 1,300 excess deaths were recorded during a heat wave in May 2010. High temperatures also reduce air quality by creating more smog, pollen, and other air-borne allergens, all of which can trigger asthma, which afflicts 235 million people around the world. Extreme heat can also exacerbate drought, leading to malnutrition and famine.

- Changing weather patterns can impact sources of fresh water and food. While drought creates water scarcity, floods can contaminate drinking water supplies, increasing the risk of water-borne diseases and illnesses spread by disease-carrying insects, such as mosquitoes. Unpredictable weather patterns and water supplies can also wreak havoc on agriculture and food supplies, particularly in regions of the world that are less climate-resilient and where staple food crops are critical for survival.

- Extreme weather and rising seas can destroy homes, public infrastructure, and entire ways of life, forcing people to move or migrate, displacing whole populations, and increasing the threat of civil unrest. Indeed, the World Economic Forum ranks extreme weather, natural disasters, and our collective failure to mitigate and adapt to climate change as among the greatest threats facing humanity in the coming decade. We're already experiencing some of those dangers. In the United States, six recent natural disasters equated to tens of thousands of hospitalizations and ER and doctor visits, as well as more than 1,600 premature deaths. In 2017 alone, 16 extreme weather-related disasters cost the country a record-breaking \$306 billion in damages.

The countries hardest hit by the impact of climate change will be low-lying nations uniquely vulnerable to sea level rise and developing countries that lack the resources to adapt to temperature and precipitation changes. But wealthy nations such as the United States are increasingly vulnerable as well. Indeed, many millions of Americans, particularly children, the elderly, and the impoverished, are already suffering climate change's wrath. Many frontline communities are majority people of color. Around the world, those most impacted by climate change are those who contribute least to emissions.

Global warming can be mitigated only with global action

The IPCC (Intergovernmental Panel on Climate Change) notes that climate change will be limited only by "substantial and sustained reductions in greenhouse gas emissions." While one can debate the merits of using a single global temperature threshold to represent

dangerous climate change, the general scientific view today-represented in the IPCC's Special Report: Global Warming at 1.5 Degrees Celsius-is that any rise in global temperatures of more than 1.5 degrees Celsius would be an unacceptably high risk, potentially resulting in major extinctions, more severe droughts and hurricanes, a watery Arctic, and an increased toll on human health and well-being. Furthermore, as the IPCC has noted, while it remains uncertain precisely how much global warming will "trigger abrupt and irreversible changes" in the earth's systems, the risk of crossing the threshold only increases as temperatures rise. To avoid major changes to life as we know it, global action must be taken. At the Paris climate conference, all countries committed to a target of keeping the temperature change to well below 2 degrees and to make efforts to prevent a change greater than 1.5 degrees. Unfortunately, the emissions gap- the emissions level with existing commitments compared to a safer trajectory-is still dangerously large as of 2020. Every tenth of a degree matters, and we cannot prevent this unless we act immediately to cut emissions deeply.

What Are the Paris Agreement's Costs?

There's a lot of misinformation out there about the Paris Agreement, including the idea that it will hurt the U.S. economy. That was among a number of unfounded claims former president Trump repeated, arguing that the accord would cost the U.S. economy \$3 trillion by 2040 and \$2.7 million jobs by 2025, making us less competitive against China and India. But as fact checkers noted, these statistics originated from a debunked March 2017 study that exaggerated the future costs of emissions reductions, underestimated advances in energy efficiency and clean energy technologies, and outright ignored the huge health and economic costs of climate change itself. Climate change is already costing public health. Research from NRDC (The Natural Resources Defense Council) scientists shows how inaction on climate change is responsible for many billions in health costs each year in just the United States, as communities around the world experience greater displacement, illness, famine, water shortages, civil strife, and death.

Research makes clear that the cost of climate inaction far outweighs the cost of reducing carbon pollution. One 2018 study suggests that if the United States failed to meet its Paris climate goals, it could cost the economy as much as \$6 trillion in the coming decades. A worldwide failure to meet the NDCs (Nationally determined contributions) currently laid out in the agreement could reduce global GDP more than 25 percent by century's end. Meanwhile, another study estimates that meeting- or even exceeding- the Paris goals via infrastructure investments in both clean energy and energy efficiency could have major global rewards- to the tune of some \$19 trillion.

In terms of employment, the clean energy sector employed more than 3 million Americans before the start of the COVID-19 pandemic- about 14 times the number of coal, gas, oil, and other fossil fuel industry workers- and has the potential to employ many more with further investments in energy efficiency, renewable energy, and electric grid modernization to replace the aging coal-powered infrastructure. Meanwhile, coal jobs aren't so much being transferred "out of America" as they are falling victim to market forces as renewable and natural gas prices decline. But supporting policies that promote an equitable transition- with community-led decision-making, a focus on equity, and retraining support- is an important means to helping communities leave the dirty energy economy behind them.

Finally, rather than giving China and India a pass to pollute, as Trump claimed, the pact represents the first time those two major developing economies have agreed to concrete and time-bound climate commitments. Both countries, which are already poised to lead the world in renewable energy, have made significant progress to meet their Paris goals.

International Agreements on Climate Change

The Paris Agreement is the culmination of decades of international efforts to combat climate change.

United Nations Framework Convention on Climate Change

In 1992, President George H.W. Bush joined 107 other heads of state at the Rio Earth Summit in Brazil to adopt a series of environmental agreements, including the UNFCCC framework that remains in effect today. The international treaty aimed to prevent dangerous human interference with earth's climate systems over the long term. The pact set no limits on greenhouse gas emissions for individual countries and contained no enforcement mechanisms, but instead established a framework for international negotiations of future agreements, or protocols, to set binding emissions targets. Participating countries meet annually at a Conference of the Parties (COP) to assess their progress and continue talks on how to best tackle climate change.

KYOTO PROTOCOL

The Kyoto Protocol, a landmark environmental treaty that was adopted in 1997 at the COP 3 in Japan, represents the first time nations agreed to legally mandated, country-specific emissions reduction targets. The protocol, which didn't go into effect until 2005, set binding emissions reduction targets for developed countries only, on the premise that they were responsible for most of the earth's high levels of greenhouse gas emissions. The United States initially signed the agreement but never ratified it; President George W. Bush argued that the deal would hurt the U.S. economy since developing nations such as China and India were not included. Without the participation of those three countries, the treaty's effectiveness proved limited, with its targets covering only a small fraction of total global emissions.

The Kyoto Protocol's initial commitment period extended through 2012. That year, at the COP 18 in Doha, Qatar, delegates agreed to extend the accord until 2020 (without some developed nations, which had dropped out). They also reaffirmed their 2011 pledge from the COP 17 in Durban, South Africa, to create a new, comprehensive climate treaty by 2015 that would require all big emitters not included in the Kyoto Protocol-such as China, India, and the United States- to reduce their greenhouse gas emissions. The new treaty- what would become the Paris Agreement-was to fully replace the Kyoto Protocol by 2020. However, the Paris accord went into effect earlier than expected, in November 2016.

Kyoto Protocol versus the Paris Agreement

While the Kyoto Protocol and Paris Agreement both set out to address climate change, there are some key differences between them. Unlike the Kyoto Protocol, which established top-down legally binding emissions reduction targets (as well as penalties for

noncompliance) for developed nations only, the Paris Agreement requires that all countries- rich, poor, developed, and developing- do their part and slash greenhouse gas emissions. To that end, greater flexibility and national ownership is built into the Paris Agreement: No language is included about the commitments countries should make; nations can set their own emissions targets (NDCs) consistent with their level of development and technological advancement. While the Paris Agreement doesn't have harsh penalties for countries not meeting their targets, it does have a robust system of monitoring, reporting, and reassessing individual and collective country targets over time in order to move the world closer to the broader objectives of the deal. And the agreement sets forth a requirement for countries to announce their next round of targets every five years-unlike the Kyoto Protocol, which aimed for that objective but didn't include a specific requirement to achieve it.

USEFUL LINKS

European Commission - Nature Conservation

<http://ec.europa.eu/environment/nature/home.htm>

Directorate-General Environment

<http://ec.europa.eu/environment/>

European Environment Agency

<http://eea.europa.eu>

IUCN - World Conservation Union

<http://www.iucn.org/>

Convention for Biodiversity

<http://www.biodiv.org/default.aspx>

WWF International

<http://www.panda.org>

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5. <https://www.thoughtco.com/animal-extinction-overview-127885>
6. <https://link.springer.com/article/10.1007/s11625-018-0542-9>
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11. <https://www.nationalgeographic.com/animals/2018/10/millions-of-years-mammal-evolution-lost-news/>
12. <https://www.pnas.org/content/115/44/11262>
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