Forum: Environment Commission

Issue: Measures to suppress the anthropocene extinction

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Introduction

The question regarding measures to suppress the Anthropocene extinction has been a persistent issue ever since several decades ago. Some claimed that the Anthropocene extinction began all the way back in 1780 due to the industrial revolution. However some also claimed that the extinction began as early as 12,000 years BP (BP is defined as 1 January 1950) due to the Neolithic Revolution. In addition, there has also been a proposition that the Anthropocene may have begun early as 14,000-15,000 years BP.

At the moment however, the Anthropocene Extinction remains proposed and therefore does not have it's own distinct term. It still remains synonymous with the Holocene Extinction (which is it's current term, being a classification for the Sixth Extinction). The main reason for the Anthropocene Extinction to be distinctly recognized is because of its definition: The significant human impact on Earth's Geology and ecosystems.

The Anthropocene Working Group Met in Oslo in April 2016 in order to gather evidence and to work on making a claim regarding that Anthropocene should be labelled as a Geographical Epoch that is distinct from the Holocene, and follows right after it. The proposal of the Anthropocene Epoch has been voted in favour by the AWG in August 2016, where an official proposal regarding this matter will be made by 2021.

There are a wide variety of human effects that constitute the Anthropocene to be officially recognized. Most of these are human effects on the environment, which include their impact on climate change, geomorphology and socioeconomic factors.

Definition of Key Terms

Term	Definition
Holocene Epoch	This is the term used for the current period of

	geographical time.
Holocene Extinction	Referred to as the 'Sixth Extinction'. The Anthropocene extinction has not been distinguished from the Holocene Extinction
Anthropocene	A proposed geological epoch dating from the commencement of significant human impact on Earth's geology and ecosystems
Anthropogenic	The environmental effects that originate from human activity
Biodiversity	Different kinds of life that are found in one area.
Ecosystem	This refers to the geographic area where both biotic (living) and abiotic (non-living) organisms work together to form a bubble of life.
The Great Acceleration	The period spanning since 60 years ago until today where human activity has caused increased detriments to the environment
Extinction	The termination of a certain kind of organism (usually species).

Background Information

The proposed Anthropocene Extinction (currently known as the Holocene Extinction) is an ongoing extinction event as a result of human activity. At the moment, the Anthropocene is not distinguished from the Holocene Extinction. As a result, they are both known as the "Sixth Extinction" that occurred in human history. The Holocene itself began at the end of the ice age, which happened 11,500 years ago, but there is no agreed start date for the Anthropocene, despite the numerous speculations about it. The classification of a mass extinction is when 75% of species have gone extinct in a geographically short period of time. Studies have shown that 83% of wild mammals, 80% of marine mammals, 50% of plants and 15% of fish have vanished due to human civilization. In addition, it is also estimated that the world has lost at least 543 land vertebrate species to extinction. The problem

that our world is facing is that extinctions that fully happen within hundreds of years, can now only happen in incrementally fewer years.

Modern humans have existed ever since 200,000 years ago. However, ever since the beginning of humanity, humans have had a disproportionately large influence over the physical, chemical and biological systems of the planet which include those that all other organisms rely on to survive. In fact, ever since the 20th century, human impacts have been increasingly detrimental. This can also be evidenced by the growth in human population ever since the year 1900 with just less than 2 billion people, to today with 7.9 billion people. The period spanning 60 years ago until today can be labelled as "The Great Acceleration." There has been a greater amount of carbon dioxide emissions, global warming, habitat destruction and ocean acidification as a result of human activities. The United Nations noted that since 1980, greenhouse gas emissions have doubled, which raised average global temperatures by 7 degrees celsius.

Trace Elements

As a result of modern activity, many chemical elements are left uncleaned, causing harm to the environment. An example of this is in the Upper Fremont Glacier in Wyoming which contains a layer of chlorine present in ice cores due to the 1960's atomic weapon testing programs. In addition, Fukushima encountered a radioactive water crisis where Strontium-90 and Carbon-14 isotopes were present. The long half life of carbon-14 which lasts for 5730 years means that the presence of this isotope could cause detriments to multiple generations of humans and animals. In addition, thermonuclear devices were used on atomic device test sites, which revealed alarming numbers of Carbon-14 and Plutonium-239 isotopes. In addition, although burning fossil fuels allows energy to be released into the environment and transferred to sources such as power stations, carbon compound residues are left untreated, contaminating the environment.

Climate

Human Activity has largely increased the amount of carbon dioxide content in the atmosphere. During the pre-industrial society, Carbon Dioxide content in the atmosphere was 280ppm (ppm is parts per million which is the number of units of mass of a contaminant per million units of total mass). However, in current days, Carbon Dioxide levels have increased to 400ppm. There are plenty of ways that humans have contributed to this addition to carbon dioxide in the atmosphere. The biggest contributor is through the burning of fossil fuels which amounts to 85% of the emissions of carbon dioxide. The other 15% comes from deforestation and land use such as cement production and processing. In going into more detail about cement production, it is a process that involves the calcination of limestone, which releases carbon dioxide as a result. Climate change is responsible for 8% of the species extinctions that occur during the sixth extinction.

Geomorphology

Human activity causes frequent changes in the configuration and composition of the surface of the earth. The first factor that causes this change is the rise of sea levels due to human activity. Research has shown that a rise in sea level caused by global warming would cause damages to trees and mangroves. In addition, although salt marshes may appear to be in danger, some of them have highly dynamic features which allow them to cope despite experiencing a rapid rise in sea level. In addition, quarrying and landscaping also alter the Earth's surface configuration. Quarrying causes extinction towards plants as it causes a complete removal of the vegetation, which are niches for wild animals. This is mainly because of the effect of dust produced. Research found that only a few species that are more adaptable would be able to adjust to new situations. The leading cause for this is because of the dust particles that are released into the air which have the potential to block and damage the stomata so that plants are unable to photosynthesize or respire.

Socio-Economic Impact

There has been a multitude of debate on the ethical and ecological impact due to biodiversity loss. The lack of biodiversity is counterproductive towards developing and enhancing human welfare through ecosystem services; therefore there would be little ecosystem services supplied to boost the welfare of humans. Between 1997-2011, the world had been estimated to lose 4-20 trillion dollars in ecosystem services owing to land change. One big issue is the fact that decision makers do not realize the linkages between economy and the ecosystem. Ecosystem services are usually provided by the government or government linked firms, and therefore this is considered to be a public good. A public good is one that is non-excludable and nonrival and is not at all provided by the free market, which is why a public good like ecosystem services are considered market failures. This outlines the allocative inefficiency due to the lack of supply of ecosystem services. A Thailand study on mangroves investigated the costs and benefits of two variables: the conservation of mangroves, and the conversion of mangroves into shrimp farms. If only services were included in the study, the outcome would be more favourable into removing the mangroves for other uses. However, if environmental regulation services were taken into account, it was more economically favourable to protect the mangroves, such as protecting coasts from harsh weather conditions.

Current Methods to Revert the Effects of the proposed 'Anthropocene' extinction

Paris Climate Agreement

The Paris Climate Agreement is a legally binding treaty of climate change. It was adopted by 196 countries in the year 2015, and was implemented in late 2016. This agreement is significant because it is the first binding agreement that is made regarding climate change. A binding agreement involves punishments or sanctions that could be at stake if a country chooses to withdraw from the argument. The main goal of the agreement is to lower global warming to around 1.5 degrees celsius. The agreement limits carbon emissions which involves the burning of fossil fuels as it is urgent for the peaking of greenhouse gas to happen as soon as possible. For example, China (the country with the largest carbon dioxide emissions) aims to peak its greenhouse gas emissions by 2030.

Storage and Treatment of Waste

Radioactive waste can be classified into three categories: Low-level radioactive waste, Medium-level radioactive waste and High-level radioactive waste. These types of waste have different disposal and storage methods. Low-level waste is typically sent to land based disposal after its packaging so that the waste could be properly managed in the long run.

High-level radioactive waste has to be given time for the heat and radioactivity to decay. Once the waste is cooled enough, they are stored in ponds, dry casks, or through deep geological disposal. Although deep geological disposal can mitigate the harmful effects of radiation towards humans, it impacts the geomorphology of the Earth, which could possibly cause disruption of a quantity of a certain species.

Intermediate-level radioactive waste (ILW) could be either long-lived or short-lived. Long-lived radioisotopes are stored in underground facilities known as geological repositories, as the radioisotope has a long half life. On the other hand, a number of countries dispose of short-lived ILW's in near disposal facilities that are near the surface. It is more efficient to dispose of short-lived ILW's nearer to the surface as disposing them deeper would bring in unnecessary costs as the short-lived ILW loses its relatively high level of radioactivity quickly.

that contains long-lived radioisotopes is also stored pending disposal in a geological repository. In the USA, defence-related transuranic (TRU) waste – which has similar levels of radioactivity to some ILW – is disposed of in the Waste Isolation Pilot Plant (WIPP) deep geological repository in New Mexico. A number of countries dispose of ILW containing short-lived radioisotopes in near-surface disposal facilities, as used for LLW disposal.

Major Parties Involved

The Anthropocene Working Group (AWG)

The AWG aims to examine the Anthropocene and it's potential addition to the geological time scale. The organization itself was established in 2009 and is currently part of the Subcommission on Quaternary Stratigraphy (SQS), a constituent body of the International Commission on Stratigraphy. In 2016, the group voted to recommend the Anthropocene as a formal geologic epoch at the 35th International Geological Congress.

World Wide Fund

The WWF aims to sustain the natural world for the benefit of people and wildlife, and aims to combat extinction. The WWF aims to halt nature loss, and to help the world achieve zero loss of natural habitats, zero extinction of species and to halve the footprint of consumption and production. They also directly aim towards stopping the extinction of species due to human activity, which fits into the definition of Anthropogen(ic): Harmful environmental action caused by human activity.

Ecuador, United States of America, Malaysia

Ecuador is currently the country that is facing the most species of endangerments (2,301). The USA and Malaysia follow Ecuador with 1,226 species that are endangered. There are many reasons why animal endangerment could happen. The USA for instance has a lot of land that is being used for development, causing species endangerment. In addition, these countries suffer from habitat loss, hunting in the wild, and pet trades.

Australia

Australia has over 500 species on the verge of extinction, which shows that Australia suffers from a huge species extinction rate. The Australian bushfires that occurred from 2019-2020 impacted nearly 3000 animals. Animals such as Frogs and Koalas became vulnerable, particularly due to the loss of habitat. The wildfires impacted the Koala population to the point where it became classified as an endangered species of Australia.

Timeline of Events

Date	Description of event
Around 12,000BP	The earliest proposed date of the Anthropocene Extinction.
Around 10,000BC	The start date of the Holocene Extinction.
Around 1760 AD	Some people believe that this is the start date of the Anthropocene due to the beginning of the Industrial Revolution. The Industrial Revolution is one where the economy shifted from originally relying on agriculture and handcrafts, to one that is based on large scale industries and manufacturing. This serves as the beginning of human activity evidently harming the environment.
1938	The concept of the Noosphere was proposed by Vladimir Vernadsky. It was known as an early concept of the Anthropocene. The Noosphere is a sphere of thought that envelops the earth. This is known as the third stage of the Earth's development, after the geosphere and the biosphere.
July, 1945	The date of the Trinity Test. The Trinity Bomb was detonated atop a 100-foot steel tower. Through an explosive use of 21,000 TNT, soil was shot up from 50,000 to 70,000 feet. As a result, the radioactive impacts spanned over a large area. Some people proposed the Trinity Test as the start of the Anthropocene extinction, especially due to the significant impact by the explosion that was conducted by the United States as part of the Manhattan Project in World War II.
January 2016	The report on the climatic, biological, and geochemical signatures of human activity in sediments and ice cores suggested the era since the mid-20th century should be recognised as a geological epoch distinct from the Holocene. There has also been a research study published on 7th January, 2016 which suggested hard evidence for the negative effects of human activity towards the Earth. This includes the rapid global

	spread of novel materials such as aluminum, concrete and plastics, which leaves their own mark on sediments. In addition, the combustion of fossil fuels released many ash particles worldwide.
April 2016	The Anthropocene Working Group (AWG) met in Oslo in order to collate evidence that supports the idea of the Anthropocene being a new geological epoch. They aimed for this new classification to happen in August, 2016.
May 2019	29 of the 34 members in the AWG panel voted in favour of an official proposal for the new 'Anthropocene Epoch' that will be entertained by the International Commission on Stratigraphy in 2021.
2021	This is when the Anthropocene Working group aimed to submit the official proposal regarding the beginning of the New Epoch. It is unclear whether the proposal has already been submitted, or its status.

Previous Attempts to Resolve the Issue

- A/RES/68/214: 20 December 2013

This is a resolution that has been implemented by the UN General Assembly. This resolution's main goal is to suggest a need to implement a convention on biological diversity and its contribution to sustainable development. The main purpose of this proposed convention is to ensure coherence and complementarity of a post-2015 global biodiversity framework up until the year 2020. The resolution has also stressed the importance of the need to engage the private sector as well as other relevant stakeholders. The convention aims to allow the alignment of these stakeholders' policies and practices towards ones suggested by the convention. There has been a previous convention on biological diversity which has been made effective in the year 1993 signed by 150 member nations in targeting three major goals: the conservation of biodiversity, sustainable use of the components of biodiversity and sharing the benefits arising from the commercial and other utilisation of genetic resources in a fair and equitable way. As a result, there has been a publication that has been contributed by the convention of biological diversity alongside the WHO and the UNEP regarding targeting post-2015 global biodiversity goals. This publication however, due to its large size, may not be as accessible towards the general public. Rather, shorter documents that are more widespread would help in targeting their proposed stakeholders.

- United Nations Environment Assembly of the United Nations Environment Programme Second session: Resolution 2/07

This resolution tackles the issue of chemical waste and their proper disposal which is a factor that causes extinction due to human activity. The resolution calls for countries to develop national strategies in making producers collect their own waste lead-acid batteries, in order to ensure that those batteries are recycled in an environmentally sound manner. A method known to dispose of radioactive materials such as lead-acid batteries is through deep geological

disposal. This may require financing from the private sector due to the land and labour needed to pursue this method of disposal. While this may prevent a lot of people facing severe health issues due to radiation, the deep mining process alters the geomorphology of the Earth. This is another cause for extinction due to human activity which may make this solution counterproductive towards suppressing the Anthropocene extinction

Possible Solutions

- Government imposed regulations on mining or manufacturing companies
  A government imposed regulation would limit the amount of output that can be produced by these companies, but this means that there would be less negative externalities that the population would have to face. Negative externalities are when these firms make a decision but do not bear the full cost of it as some costs end up being for the external wildlife. The government could impose regulations in a multitude of ways, such as but not limited to depth and location of mining or quantity of goods being manufactured at a time. Policies that control production or supply typically last for the long term, justifying its effectiveness.
- Awareness initiatives for endangered species
  The government can work with NGOs to execute this. They can create social media posts, street posters, or host biannual conferences regarding the endangerment of a species, or advertisements that encourage volunteering to restore native forests, ecosystems and grasslands. In addition, a possible approach would be to advertise paid parks or wildlife recreational centres so that they could incentivize tourists to visit. This therefore allows the organization/firm to earn money and allow more people to have a job in the wildlife industry to protect endangered species.
- Government spending on water treatment facilities
  Water is a necessity for all living organisms. However water contamination could further accelerate extinction due to it containing various chemical isotopes. A source mentioned that municipalities around the area of The West Bank and Gaza strip do not have the incentive to carefully maintain their pipes and sewage facilities. The West Bank and Gaza Strip has been a war-torn area where many airstrikes occurred or where other offensive weapons either passed through or ended up. As a result, this could lead to it's water being more contaminated. This is why the government should resort to providing firms with subsidies or the government should provide clean water themselves if they have the capability and capacity to maintain their sewage facilities. As a result, this will lessen extinction.
- Carbon Taxes
  These are taxes levied on the carbon emissions required to produce goods and services. Carbon taxes are set so that the manufacturing companies will be able to pay the additional costs that are given out to society rather than merely the costs they accumulated for the production of the goods itself. Since carbon dioxide

emissions seem to accelerate the Anthropocene Extinction. These taxes will incentivize producers or manufacturing companies to switch to using more sustainable methods of production.

Bibliography

Lameed, G A, and A E Ayodele. Effect of Quarrying Activity on Biodiversity: Case Study ... African Journal of Environmental Science and Technology, 18 Oct. 2010, https://www.ajol.info/index.php/ajest/article/download/71340/60295.

"How To Prevent Asian Elephant Extinction? - Neeness". *Neeness*. https://neeness.com/how-to-prevent-asian-elephant-extinction/#:~:text=How%20Can%20extinction%20be%20prevented%3F%20Scientists%20tell%20us,creates%20millions%20of%20jobs%20and%20supports%20local%20businesses.

Water For The Future: The West Bank And Gaza Strip, Israel, And Jordan. 1999, https://www.nap.edu/read/6031/chapter/7#106.

United Nations General Assembly, 2013, https://undocs.org/en/A/RES/68/214.

Dunbar, Brian. “The Human Factor: Understanding the Sources of Rising Carbon Dioxide.” NASA, NASA, https://www.nasa.gov/mission_pages/oco/news/oco-20090113.html.

Platt, John. "Can You Guess Which Country Has The Most Endangered Species?". *Scientific American Blog Network*, 2013, https://blogs.scientificamerican.com/extinction-countdown/can-you-guess-which-country-has-the-most-endangered-species/#:~:text=According%20to%20IUCN%20counts%2C%20the,)%20and%20Mexico%20(1%2C074).

Wedocs.Unep.Org, 2016, https://wedocs.unep.org/bitstream/handle/20.500.11822/11183/K1607167_UNEPEA2_RES7E.pdf?sequence=1&isAllowed=y.

"UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating' - United Nations Sustainable Development". *United Nations Sustainable Development*, 2019, https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/.

"Now Is Our Chance to End Animal Extinction." WWF, WWF, https://www.wwf.org.au/get-involved/end-animal-extinction.

"Lychnos." The Socio-Economic Costs of Biodiversity Loss, https://fgcsic.es/lychnos/en_en/articles/socioeconomic_costs_of_biodiversity_loss.

"Home". *Oecd-Ilibrary.Org*, 2022, https://www.oecd-ilibrary.org/sites/25ecdcc0-en/index.html?itemId=/content/component/25ecdcc0-en.

"The Earth's Sixth Mass Extinction Is Accelerating". *Popular Mechanics*, 2020, https://www.popularmechanics.com/science/animals/a32743456/rapid-mass-extinction/. Accessed 25 Jan 2022.

"What Is The Anthropocene?". *Nhm.Ac.Uk*, 2022, https://www.nhm.ac.uk/discover/what-is-the-anthropocene.html. Accessed 25 Jan 2022.

"What Is The Noosphere? « Human Energy". *Humanenergy.Io*, https://humanenergy.io/projects/what-is-the-noosphere/.

"Industrial Revolution | Definition, History, Dates, Summary, & Facts". *Encyclopedia Britannica*, https://www.britannica.com/event/Industrial-Revolution.

"The Paris Agreement". *Unfccc.Int*, https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.

"Storage And Disposal Options For Radioactive Waste - World Nuclear Association". *World-Nuclear.Org*, 2021, https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-waste/storage-and-disposal-of-radioactive-waste.aspx.