

Committee: Environmental Sub-Commission 2 (EC2)

Topic: Addressing the impacts of resource extraction on biodiversity

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Topic Introduction

The extraction of natural resources is a process which affects our daily lives; from food to petroleum and electricity, nearly every necessity or pleasure is reliant on extraction of resources. However, these resources, particularly those relevant to nutrition, are dependent on the biodiversity of our world. According to a *Guardian* article, the process of resource extraction is responsible for half of the world's carbon emissions and more than 80% of biodiversity loss¹

There are many NGOs and governmental organisations, such as the World Wildlife Fund (WWF) or Greenpeace,² whose objective is the conservation of biological diversity through collaboration with governments and intergovernmental organisations such as the United Nations, but without a consensus a minimal effect can be made on the climate emergency.

The climate crisis is caused by global warming, biodiversity loss, pollution creation and waste. To prevent this, we must utilise the natural resources that we already have in a more responsible and sustainable manner.³ To achieve “Sustainable Consumption and Production” of resources in our world, we must utilise methods of these activities that will not have an effect on our planet.

This means that the issue being discussed in this guide is of an importance greater than the comforts and necessities of our daily lives, but of survival.

Definition of key concepts

Biodiversity

‘The existence of a wide variety of plant and animal species living in their natural environment’.⁴

¹ Global Resources Report, UN Environment Programme, 2019

² <https://ngofeed.com>

³ GRO24 Summary for Policymakers.pdf Inger Andersen

⁴ Cited to the Collins dictionary



Resources

“The assets that a country has and can use to increase its wealth, such as coal, oil, or land.”⁵

Extraction

“The process of obtaining resources from the earth or environment, for example by using industrial or chemical processes.”⁶

Extracted Resources⁷

“The withdrawal of materials from the environment for human use, including fossil fuels (oil, gas, and coal), rocks and minerals, biomass via deforestation and fishing and hunting, and water.”

Circular economy

“The circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting. The circular economy tackles climate change and other global challenges, like biodiversity loss, waste, and pollution, by decoupling economic activity from the consumption of finite resources.”⁸

Background Information

The global community's reliance on resource extraction

People use extracted resources every day; whether it is by using an automobile or consuming meat products, extracted resources are part of our lives. Without resource extraction, society would be essentially living in a pre - industrial, mediaeval world, without many of the comforts of our present

⁵ Cited to the Collins dictionary

⁶ Cited to the Collins dictionary

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<https://ugc.berkeley.edu/background-content/resource-extraction/#:~:text=The%20extraction%20of%20resources%20refers,fishing%20and%20 hunting%2C%20and%20water.>

⁸ <https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>



lives, such as running water, easy transport, electricity or such abundant food. However, resource extraction and the development of our species is almost entirely based on economic rather than environmental development. This means that humans, when making a choice concerning the environment in industry, they will most likely consider the economic factors such as paying labourers or the profit margin of the company rather than whether the environment will be affected. As this has been the common practice since the beginning of resource extraction by humans, the environment has suffered immensely.⁹

The effects of resource extraction on biodiversity historically

At the beginning of the industrial revolution in 1760, resource extraction was far less harmful to biodiversity and the environment than it is today, and humans were far less reliant on fossil fuels than we are today. However, according to the world bank in 2014 Sixty-six per cent of global energy is provided by fossil fuels¹⁰

As can be seen, it is imperative that alternate sources of energy are found for the world's biodiversity to survive.

Resource extraction also used to be on a much smaller scale, which meant that less habitats and therefore less biodiversity was affected. However, according to a study, buildings, transport and the resources they require increased 23 times between 1900 and 2010.¹¹

⁹ <https://www.ellenmacarthurfoundation.org/plastics-and-the-circular-economy-deep-dive>

¹⁰ <https://www.unep.org/news-and-stories/story/were-gobbling-earths-resources-unsustainable-rate>

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<https://theconversation.com/the-20th-century-saw-a-23-fold-increase-in-natural-resources-used-for-building-73057>



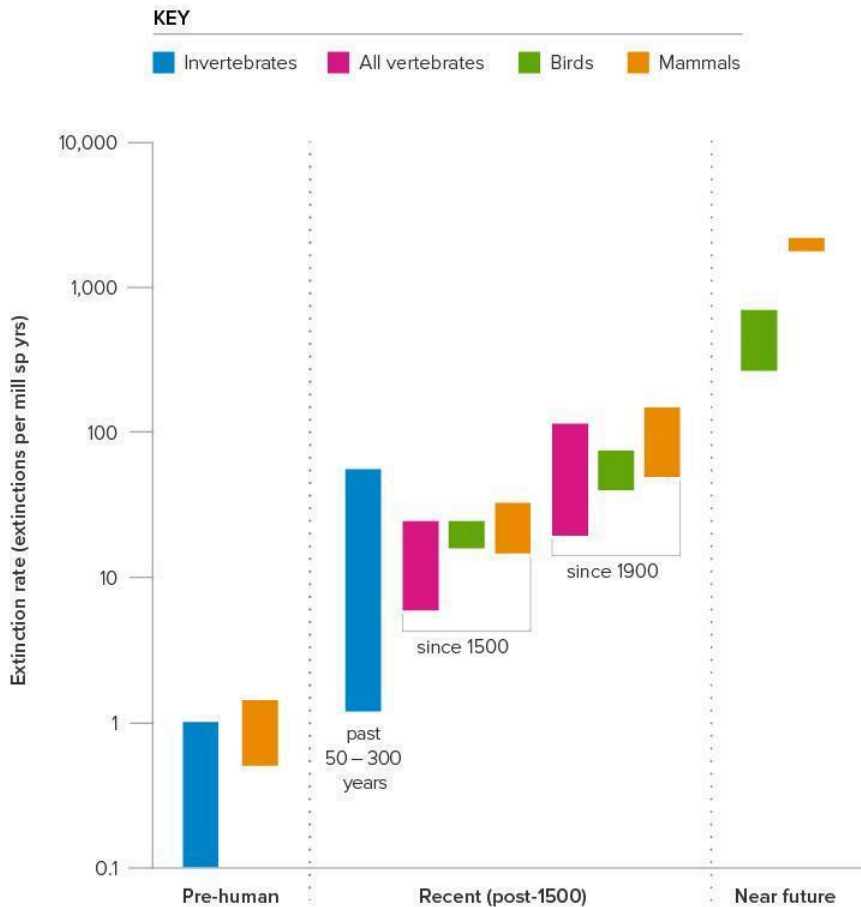


Figure 1: a graph of accelerating extinction since prehistoric periods.¹²

Furthermore, according to a United Nations study, by 2060 the necessity for extracting resources globally is expected to rise by 60%¹³.

Methods of extracting resources historically

Historically, particularly before the industrial revolution, resources were extracted in a rather different manner than they are today. Many of the methods utilised had far less of an effect on

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<https://royalsociety.org/news-resources/projects/biodiversity/decline-and-extinction/#:~:text=Loss%20of%20abundance&text=Analysis%20of%20aggregated%20data%20on,numbers%20in%20those%20that%20remain.>

¹³ <https://www.theguardian.com/environment/2024/jan/31/raw-materials-extraction-2060-un-report>

biodiversity than extraction does today. The ancient Egyptians built up a fire against a rock face and then doused it in water to split it which was much better for biodiversity preservation than using enormous and industrial machinery to extract the same resources¹⁴. It was, however, far less efficient which is why the new methods were created at the expense of the biodiversity in extraction areas.

Impact of resource extraction on biodiversity today

With the implements that are now used to extract resources result in a cheaper and more efficient system. For example the oil pumpjack is far more effective than previous methods¹⁵. The same applies to logging and mineral mining all of which have been sublimated by the new technology used in those fields.

Newer and larger technology also means that the area is more affected if an accident should occur as the work is on a larger scale. The Deepwater Horizons disaster in 2010 is a prime example of how, when large scale extraction takes place, the problems that occur are much larger. The biological effects of that particular event were devastating, it being the largest oil spill in United States history and spilling 134 million gallons of oil along the gulf of Mexico, killing thousands of marine mammals and sea turtles and contaminating their habitats.¹⁶

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<https://www.encyclopedia.com/environment/energy-government-and-defense-magazines/resource-extraction#:~:text=Resource%20extinction%20activities%20have%20been,back%20to%201617%20in%20Germany.>

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<https://oilpro.ca/5-interesting-questions-about-pumpjacks-answered/#:~:text=Before%20the%20pumpjack%2C%20oil%20extraction,efficient%20with%20yields%20increasing%20dramatically.>

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<https://oceanservice.noaa.gov/news/apr17/dwh-protected-species.html#:~:text=Examples%20of%200%20impacts%20to%20species,survival%20and%20reproductive%20success%20in>





Figure 2: An oiled Kemp's turtle rescued near the wellhead of the spill. ¹⁷

Resources also include the umbrella of meat products that are consumed. Today, the globe consumes far more meat than it did historically, with the consumption of meat per capita per year almost doubling between 1961 and 2013, from 23kg each per year to 43kg. A global population living off meat will evidently require more resources such as land and water and release more carbon dioxide; thus reducing the habitats of other animals originally in that farming area and also biodiversity while releasing greenhouse gases into the atmosphere.¹⁸

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<https://maritime-executive.com/article/report-wildlife-impacts-persist-a-decade-after-deepwater-horizon>

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<https://royalsociety.org/news-resources/projects/biodiversity/consumption-patterns-and-biodiversity>

Due to the overuse of resources as well as the habitat loss and damage throughout history, biodiversity has been falling rapidly. Although much of global biodiversity loss has occurred in the 20th and 21st centuries, information about extinct species has been recorded since the year 1500, a year from which a steady increase in extinct species was recorded¹⁹. One measure that is used for species in general is the number of vertebrae that have become extinct. According to analysis a decline of an abundance of species was 68%²⁰ between the years 1970 and 2016. This is an enormous difference as was chiefly a result of resource extraction which was in turn a result of increased consumerism.

Major countries/ organisations and alliances²¹

World Wildlife Fund (WWF)

The WWF is one of the largest organisations aimed at biodiversity conservation. They have a set of rigid goals and work with governments and organisations to attain them. These goals consist of conserving local natural resources, transforming markets and policies toward sustainability, and the protection and restoration of species and their habitats.²²

¹⁹ <https://naturalhistory.si.edu/education/teaching-resources/paleontology/extinction-over-time>

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<https://royalsociety.org/news-resources/projects/biodiversity/decline-and-extinction/#:~:text=Loss%20of%20abundance&text=Analysis%20of%20aggregated%20data%20on,numbers%20in%20those%20that%20remain.>

²¹ <https://ngofeed.com>

²² <https://www.worldwildlife.org/about#:~:text=WWF%20works%20to%20help%20local,local%20to%20a%20global%20scale.>

WWF goals



Conservation International

This organisation focuses on preserving areas of high biodiversity by designating protected areas, prevention of deforestation, and working with the indigenous peoples of the area, as well as creating links between sustainable production, and nature conservation.²³

Greenpeace

Greenpeace is an organisation which takes a peaceful approach to lobbying with governments and defending the environment. Some of their main aims are the defence of ancient forests and the preservation of biodiversity.

Major countries

According to recent analysis, approximately 60% of global biodiversity loss has occurred in seven countries²⁴ according to the Royal Society: Indonesia, Malaysia, Papua New Guinea, China, India, Australia and the USA, where the majority has occurred on the islands of Hawaii. This has been chiefly due to the malpractice that can be observed in many of their extraction industries, many of which do not protect or conserve the biodiversity around them.

On the other hand, there are many countries which are moving in a positive direction in terms of Biodiversity conservation. Canada, for example, is a country which has invested vast quantities into the preservation of its biodiversity. It has done this by creating vast national parks and allowing species living there to grow and flourish, by protecting the oceans around Canada from pollution and human interference according to the Government of Canada:

‘Since 1885, Canada has taken action to protect almost 1 million km² of land – nearly 10% of Canada's land mass – and 56 000 km² of our oceans and Great Lakes. We have the best national park

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<https://www.conservation.org/priorities/expanding-nature-positive-economies#:~:text=Conservation%20International%20aims%20to%20link,%E2%80%9Cnature%2Dpositive%E2%80%9D%20economies.>

Conservation international goals

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<https://royalsociety.org/news-resources/projects/biodiversity/where-is-most-biodiversity-loss-happening-and-why/>



system in the world and have grown it by almost 50% since 2005.²⁵ This action has been very effective in conserving Canada's wildlife and biodiversity.

Previous attempts to solve the issue

Minimising pollution from extractive industries through regulations

Norway's Oil for Development programme (OfD) was an example of a government-funded programme which, although advocating for the use of fossil fuels in third-world countries, tried to regulate and prevent excess pollution caused by resource extraction. The project, however, is to be phased out and concluded in 2024 as it was realised that fossil fuels have no place in the future development of a country.²⁶

Reducing the demand for minerals and metals by greater re-use and circularity

The Ellen Macarthur foundation recently wrote an article stating that, because the Chinese cosmetics industry is booming, a solution needs to be found for the plastic waste that is inevitable. It suggested a system of circular economy where the bottles of the products are sent back to be reused resulting in a far less damaging industry to biodiversity and the environment.²⁷ This is aimed at reducing the amount of waste in the Chinese cosmetics industry by reusing and reducing the waste that is involved.

²⁵ <https://www.canada.ca/en/environment-climate-change/services/biodiversity.html>

²⁶ <https://www.norad.no/en/front/thematic-areas/oil-for-development/>

²⁷ <https://www.ellenmacarthurfoundation.org/circular-examples/reducing-plastic-waste-in-cosmetics-through-tech-innovation-yan-an-tang>



Possible solutions

Reducing the consumption of resources from the current rate

One of the main reasons for the effect of the extraction of resources on biodiversity, is the speed at which these resources are now consumed. A car uses, on average, 490 gallons of petrol per year.²⁸ Multiply 490 by 1.4 billion which gives us 68.6 billion gallons of petrol per year on cars alone. This has a detrimental effect on biodiversity because the greenhouse gases which are released into the atmosphere from the consumed fuel increases the rapidity of climate change meaning that ecosystems and therefore the future of species are critically at risk. The use of less fuel can be implemented on a national, or personal scale and does help to reduce biodiversity loss. This is only one example of the many ways that governments and organisations can reduce their consumption of fuel. The reduction of the use of cars can be achieved by means of implementing comprehensive, regular and affordable public transport systems which are available to everyone, while ensuring that it is widely used.

Finding different methods of extracting necessary resources

The methods which are adopted to extract resources are often detrimental to the environment around them. This can be due to the interruption of the habitat to create a diamond mine, the implementation of an oil rig, or the destruction of ancient rainforests to supplement wood consumption. All of these processes have a negative impact on the biodiversity of the area, as it is either damaged or destroyed by the effect of the extraction there. Furthermore, many of the methods used for extraction are very accident prone and if an accident does occur, it can do irreparable damage to the biodiversity of the area. Utilising less harmful resources that have less of an effect on biodiversity is a viable solution for this problem. These can consist of renewable resources for electricity, such as wind, hydroelectric or solar power and the use of the circular economy which relies on the use and reuse of resources and materials. An example of this could be the system of milk delivery which is used in Britain, wherein the milk is delivered every morning in glass bottles, drunk, then the bottles are returned the next morning with the next delivery.²⁹ Thus

²⁸ <https://www.eia.gov/energyexplained/gasoline/use-of-gasoline.php>

²⁹ <https://blog.themodernmilkman.co.uk/life-cycle-milk-bottles/>



the same items can be used over and over again indefinitely as glass is a material which does not break down over time unlike plastic.

Utilising renewable resources instead of non-renewable resources

Using less harmful resources, such as renewable resources, has less of an impact on the environment and biodiversity. These include hydroelectricity, solar power and wind power. The extraction of these resources requires far less energy than those of non-renewable resources. Some of the main reasons that resource extraction affects biodiversity so significantly, is the sheer energy required for the extraction of said resources. Furthermore, these resources expend far fewer harmful gases or pollutants than the resources which are currently used today because instead of converting energy by means of incomplete combustion which releases harmful gases such as carbon monoxide or carbon dioxide both of which are greenhouse gases and both of which are harmful humans. With the use of renewable resources these harmful gases along with many other maligned side effects can be eradicated. The International Renewable Energy Agency (IRENA) is one which supports and encourages governments to utilise renewable resources and eases the transition between renewable and non-renewable resources. Its methods include Hydroelectricity plant implementation, solar power implementation, and wind farms.

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