Are Humans Ruining the Earth?

Around two million years ago the first humans evolved and became distinguished from monkeys. Since then, we have evolved further and have learnt how to harness fire and use a larger variety of materials in many ways to help improve our chance of survival and quality of life. By doing this we have taken more and more resources from the environment, but we have not always replaced them. This has meant that the ecosystems have been negatively affected. This has caused the planet to become 'ruined' and as an effect the planet will not be able to support our lives and the other millions of plants, animals, and fungi in the future if we do not change our way of life.

Climate Change

Climate change is the change in the climate (environmental conditions) on a regional or global scale. Climate Change is natural as over the 4.54 billion years the earth has been in existence the climate has changed. There have been glacial and interglacial periods. In the last quaternary period, the temperature has fluctuated by 6 degrees Celsius. These changes have been caused by volcanic activity, sunspots and the earths orbital and axis changes.

However, due to human activities the climate is changing in an unnatural way. We have caused this by burning fossil fuels, deforestation, and the use of agricultural methods. This has caused extra carbon dioxide, nitrous oxide, methane, and halocarbons to be released into the atmosphere. This has contributed to the greenhouse effect. This has caused the planet to warm up unnaturally. This has had many effects on different parts of the planet.

In the oceans acidification is occurring where the pH of the water decreases becoming more acidic due to more carbon dioxide being dissolved in the water. This changes the environment for any animals so if they do not adapt, they would become extinct. The ocean produces over 50% of the world's oxygen. This is from phytoplankton. The phytoplankton work best at pH levels above 7.6 meaning that at the moment they will keep respiring as the pH level of the ocean is 8.1. However, the ocean could become more acidic in the future meaning that less oxygen could be produced. This would have a severe impact on all organisms that require oxygen to respire (most).

Coral bleaching is occurring in shallow waters as the water temperature is increasing, causing whole ecosystems to die as with the coral dead it affects the food web due to the coral being a keystone species in supporting life. If the planet warms to 1.5 degrees Celsius then it is thought, according to the IPCC, that 70-90% of coral reefs will be lost and if we reach 2.0 degrees Celsius then 99%< will be lost. This will have a severe impact on many species.

As the planet warms the sea level is rising. This is from thermal expansion of the water (as warmer water takes up more room per molecule) and the melting of ice sheets. This is predicted to cause a 0.26-0.77m rise at 1.5 degrees Celsius. This will flood many habitats.

On the land climate change is causing more desertification. This would mean that more areas become deserts and would remove habitats for many species of animals causing them to become extinct. 4% of known ecosystems will change when climate change reaches 1 degree Celsius. This will have a severe effect on many organisms, but not as much if it reaches 2 degrees Celsius (13%).

Humans can limit the effects of climate change by mitigating. We can use afforestation, Carbon Capture and storage and renewable energy to help reduce global heating. Also, there are a few international agreements (Paris and Kyoto Protocol) to make legally binding contracts, so countries

reduce their emissions. However, according to the IPCC, at the current rate, the Paris Agreement of limiting global warming to 1.5 degrees Celsius will not be reached unless action is taken before 2030 as after 2030, we will overshoot the 1.5 degrees goal. This would cause a reliance on Carbon Capture and storage to reduce our emissions and limit the effect that human caused climate change has on the planet.

How the Oceans are Being Affected by Humans

Human development and invention of plastic has had a drastic effect on the oceans. In the Pacific Ocean there is the Great Pacific Garbage dump. This is formed of plastic pollution. Most of the plastic pollution that ends up in the ocean sinks to the seabed (70%) whilst the rest forms patches around the world. The biggest is in the Pacific. Due to the dump being in international waters no country has accepted responsibility for it, so the dump is still growing. The dump is so large that it would take 67 ships a whole year to clear less than 1% of the plastic. This is just the 30% on the surface, not even the plastic on the bottom, and the microplastics that are invisible to the naked eye. China, Indonesia, and the Philippines are the main contributors to the plastic waste in the ocean producing around 13.9 million metric tonnes in 2010.

Furthermore, humans have spilled many gallons of fuel and oil into the ocean. Even today in less developed countries they still purposely dump oil into the ocean. This blocks the sunlight meaning that many marine plants die as they cannot photosynthesise. Fish, turtles and otters can get smothered in the oil or fuel causing them to have problems respiring, feeding and maintaining constant body temperature causing many to die.

Many humans rely on the ocean as a source of food and income. However due to intensive fishing many fish stocks are depleted. (e.g., bluefin tuna have decreased by 97%). With Climate Change fish catches are believed to be reduced by 1.5 million tonnes which would have a severe impact on billions of people and the planet meaning that other sources of food will be exploited impacting the planet.

Also, humans use sea mining to extract ores. This has a significant impact as much of the ecosystem is destroyed, which would cause many species to become endangered. This would affect the food chain, negatively impacting the planet.

How the Land is being affected by humans

With the human population growing year on year there is a greater demand for food. Agriculture (Cultivation of soil and practice of farming) has expanded and evolved over millions of years. However, it has come with costs. In recent years by using pesticides and fertilisers, many chemicals have seeped into the water cycle which has and will pollute the water for many years to come. This could cause bioaccumulation and cause many animals/ species to die. Also, by cultivating the land it means that the land would have had to been cleared. By cutting down the trees (deforestation) it has removed habitats for many millions of species. This is presently an issue in the Amazon Rainforest, Congo, and Malaysia as they are prime areas for palm oil growth and cattle rearing.

Deforestation is also used to clear land for human development (urbanisation). The major negative effects include the loss of biodiversity, air pollution, noise pollution and the rubbish produced.

In India the river Ganges is the most polluted in the world. This is due to industry (mainly leather) and sewage dumping 2.9 billion litres in the river each day. In the UK many water companies have recently being found out to have illegally dumped raw sewage into the water. These examples of industry illustrate the negative effect that humans have on the rivers and the surrounding land.

The UK produces 221 million tonnes of waste every year. Just under 50% of this waste goes to landfill each year. This contaminates the surrounding environment and will account along with the rest of landfill in the world for 10% of the greenhouse emissions in 2025 according to the ISWA from the methane, among other gases released as they decompose. The company Amazon has destroyed millions of useable products a year, many going to landfill. These examples highlight that humans are ruining the land as we do not properly deal with the waste we produce each year.

On the other hand, humans do recycle much of their rubbish. In the UK 45.7% of household waste is recycled in the UK or abroad. This benefits the environment. Also, the use of bioremediation (a process to treat contaminated land or water) could massively benefit the planet as it removes pollution. This has worked well at the 2012 Olympic Park in London.

How the Atmosphere is being affected by Humans

When humans combust materials, they release acids (sulfuric, nitric, and carbonic among others). These gases travel up into the atmosphere, changing the balance in the atmosphere, and react with the water vapour in the air. This forms acid rain. This then also affects ecosystems below as with a low pH it causes trees and plants to have stunted growth for years making trees more susceptible to falling in storms or cold weather, which could affect an ecosystem in the long run.

Since the industrial revolution there has been the presence of smog in many places around the world. Smog is formed from the reaction between UV light with oxides, dioxides, particulate matter, and ozone. This creates a great haze above areas that has a detrimental effect on the environment. Smog reduces growth on trees, it causes crop yields to reduce on sensitive crops and it severely affects respiratory systems, including humans. Bad air quality kills around 3 million a year in the world with Nigeria, Pakistan and India having many of the worst cities in the world.

To reduce the effects on the atmosphere, humans need to stop burning fossil fuels to reduce the number of gases in the atmosphere so that they do not chemically react to form acid rain or smog. By using Carbon Capture and Storage it would reduce the effect even more.

Human Developments

Over millions of years humans have designed and invented many great machines and technologies. These technological advancements can help improve the state of the planet. In Freiburg their whole town produces clean energy from solar panels, this helps save the planet as it produces no emissions. The advancement in clean energy, electric and hydrogen cars, and the company airbuses concepts for hydrogen planes would all help the planet by reducing emissions. The International Space Station (ISS) provides valuable information along with satellites of the general global trend in its climate and how human activity has such an influence on the planet. This can be used with studies to create a solution to how humans are ruining the planet.

Also, our mental development with new original ideas have helped us develop. With the ability to come up with the ideas to create laws, risk categories for animals, introduction of zoos, and

protection of areas to help conserve the planet would help save the planet as there would be a larger biodiversity.

Conclusion

I believe that humans are ruining the planet. This is from all the waste we produce to our processes to improve our quality of life to our everyday lives. Human beliefs are hard to change so without everyone believing the same reality of climate change and pollution then the planet will not be saved. We have the initiative and technology to improve the planet but due to some humans not deeming it necessary to take drastic actions the planet is deteriorating at an accelerating rate.