

UNDERSTANDING DEFORESTATION

DEFORESTATION IS A PROCESS OF REMOVING, DESTROYING, OR CLEARING A LAND THROUGH DISMANTLING PLANTS AND TREES FOR A REASON INCLUDING CATTLE RANCHING AND LOGGING THAT IS ESSENTIAL FOR MAKING MATERIALS. DEFORESTATION IS ALSO HAPPENING A THOUSAND YEARS AGO AFTER ANCIENT PEOPLE HAVE ADOPTED FARMING, CATTILING, CROPPING, AND HOUSING. UNTIL THE MODERN AGE CAME, IT BECAME AN EPIDEMIC. AS WE CAN OBSERVE, OUR NEIGHBOR'S HOUSE AND THE SHELTER THAT WE LIVED IN TODAY WAS ONCE A FOREST, TREES WERE EVERYWHERE BUT IT WAS SLOWLY REMOVED FROM TIME TO TIME IN ORDER TO MAKE SPACES AND PRODUCE HOUSES. THIS EXPLAINS THAT DEFORESTATION HAS ITS PROS AND CONS WHERE IT IS BENEFICIAL FOR US BECAUSE WE CAN LIVE IN A COMFORTABLE HOUSE, BUT EXPLOITING DEFORESTATION WILL LEAD US INTO DESTRUCTION.

IMPACTS OF IN A PERSON'S HEALTH

CHRONIC ILLNESSES ALSO KNOWN AS CHRONIC DISEASES ARE LONG-LASTING CONDITIONS WHICH SLOWLY PROGRESS.

EXAMPLE:



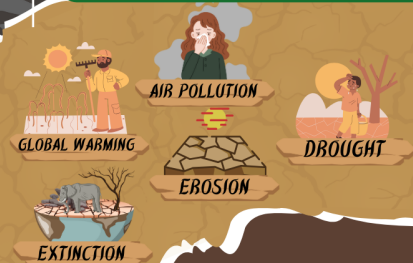
PROGRESS MADE BY THE PHILIPPINES TO BATTLE AGAINST DEFORESTATION

DEFORESTATION IS A SERIOUS PROBLEM AFFECTING MANY COUNTRIES WORLDWIDE; THE PHILIPPINES IS NO EXCEPTION. THE COUNTRY IS HOME TO A VAST ARRAY OF UNIQUE FLORA AND FAUNA, BUT DEFORESTATION HAS PUT MANY OF THESE SPECIES AT RISK OF EXTINCTION. OVER THE YEARS, THE PHILIPPINES GOVERNMENT HAS IMPLEMENTED VARIOUS PROGRAMMES AND INITIATIVES TO COMBAT DEFORESTATION AND PROMOTE REFORESTATION, BUT THE BATTLE IS STILL ONGOING. IN THIS ARTICLE, WE WILL EXPLORE THE PROGRESS MADE BY THE PHILIPPINES IN THE FIGHT AGAINST DEFORESTATION, THE CHALLENGES IT FACES, AND WHAT MORE NEEDS TO BE DONE.

ONE SUCH PROGRAMME IS THE NATIONAL GREENING PROGRAMME, WHICH AIMS TO PLANT 1.5 BILLION TREES ACROSS 1.5 MILLION HECTARES OF LAND BY 2028. THE PROGRAMME HAS BEEN SUCCESSFUL IN PLANTING MILLIONS OF TREES ACROSS THE COUNTRY, AND IT HAS ALSO CREATED THOUSANDS OF JOBS IN THE FORESTRY SECTOR.

IN ADDITION TO THE NATIONAL GREENING PROGRAMME, THE PHILIPPINES ENACTED VARIOUS LAWS AND POLICIES TO PROTECT ITS FORESTS. ONE SUCH LAW IS THE FOREST MANAGEMENT BUREAU'S COMMUNITY-BASED FOREST MANAGEMENT PROGRAMME, WHICH AIMS TO INVOLVE LOCAL COMMUNITIES IN FOREST MANAGEMENT AND CONSERVATION EFFORTS. THE PROGRAMME SUCCESSFULLY REDUCED DEFORESTATION RATES IN SOME AREAS AND PROMOTED SUSTAINABLE FOREST MANAGEMENT PRACTICES.

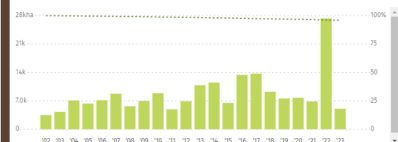
IMPACTS IN THE ENVIRONMENT



DEFORESTATION

PRIMARY LOSS IN THE PHILIPPINES

From 2002 to 2023, Philippines lost 190 kha of humid primary forest, making up 13% of its total tree cover loss in the same time period. Total area of humid primary forest in Philippines decreased by 4.1% in this time period.



DEFORESTATION

WHAT ARE THE HARMFUL EFFECTS OF DEFORESTATION IN THE ENVIRONMENT?

Deforestation is a process of removing, destroying, or clearing a land through dismantling plants and trees for a reason including cattle ranching and logging that is essential for making materials [1]. Deforestation is also happening a thousand years ago after ancient people have adopted farming, cattling, cropping, and housing. Until the modern age came, it became an epidemic [1]. As we can observe, our neighbor's house and the shelter that we lived in today was once a forest, trees were everywhere but it was slowly removed from time to time in order to make spaces and produce houses. This explains that Deforestation has its pros and cons where it is beneficial for us because we can live in a comfortable house, but exploiting deforestation will lead us into destruction.

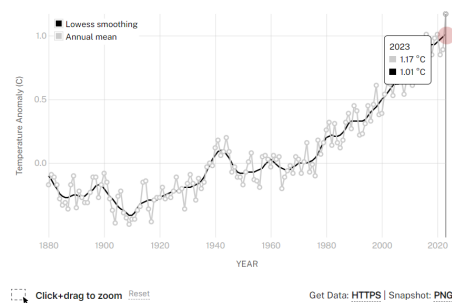
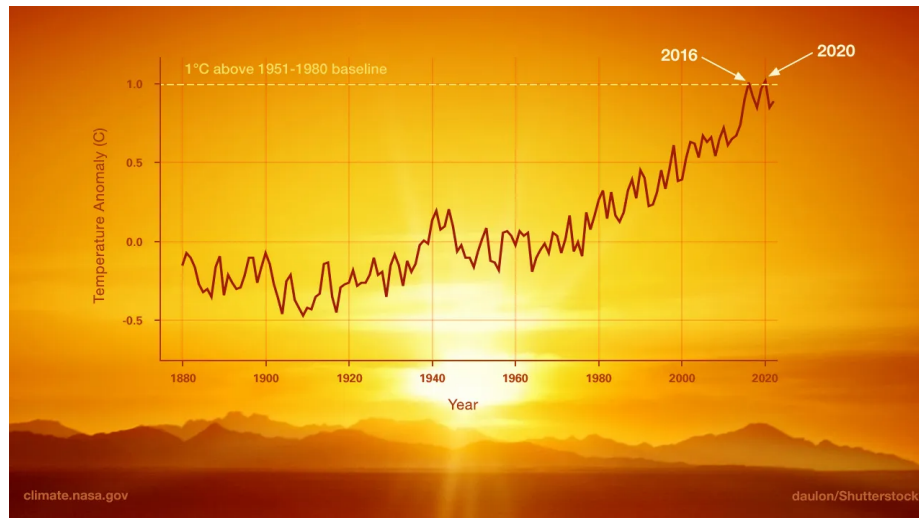
According to National Geographic, there are about 30% of rainforests left undamaged throughout the world's land area. The earth has lost 420 million hectares or about a billion acres of forests since the year 1990, the loss of those forests is at an alarming rate which can be susceptible for global warming when it is aggravated. The Food and Agriculture Organization of the United Nation stated that 17% of amazonian rainforests in Africa and South America were destroyed over the past 50 years, and the loss percentage is still rising and persists meaning the deforestation activities still occurs. By the year of 2020, the Amazon Conservation Org. had reported that the destruction percentage rose by 21% which is comparable to the size of Israel [9].

IMPACTS OF DEFORESTATION TO THE ENVIRONMENT

Deforestation also has a negative impact on both human health and the environment. Deforestation is a process of clearing or removing trees for some reason but it will lead to consequences like global warming, increased carbon dioxide emissions, air pollution, etc. This segment will be discussing the impacts of deforestation in our health and in the environment.

1. GLOBAL WARMING / CLIMATE CHANGE

- One of the causes of deforestation is the rising of temperature affecting the air causing heatwaves and drought, this phenomenon is called **Global Warming** and it became a common phenomena in the present day [2]. It has been observed since the pre-industrial period until today due to human activities that are affecting the earth's atmosphere such as fossil fuel burning that leads to permanent and regrettable consequences [3]. The statement above helps the people to realize the devastating effect and mass destruction that it will give to our planet and to our species.



Source NASA, NAT GEO ETC.

2. EXTINCTION

- Rainforests are places full of a variety of natural resources, it gives shelter to many animals including the wild ones and it is one of the highest contributors of oxygen for humans. It has a significant factor ensuring the overall health of the whole planet. However as the world continues to develop and innovate, the human exploitation of deforestation to produce houses, widen roads, etc. the planet's health decreases affecting us humans and animals leading to climate change or global warming which has a potential to end our existence if deforestation was over exploited in the future [4]. 10% of carbon emissions throughout the planet.

3. EROSION

- Erosion, according to National Geographic, is a geological process where soil is being carried away through natural forces such as wind or water. Soil erosion can lead to soil infertility which has a significant contribution to affecting or destroying the crop yields. Deforestation has a big factor leading the soil to lose its support, which are trees and plants that help the soil to hold its place, once it is removed it will be easily washed away by flood and blown by wind [5].

4. DROUGHT

- According to the World Health Organization (WHO), drought is a natural climate cycle that can happen anywhere in the world. It states that it is a disaster where the land or an area lacks precipitation that leads to water shortages. It is very serious, especially to our health, environment, economy, and agriculture. Deforestation can exacerbate the situation by disrupting the water cycle and reducing the process of transpiration that occurs in plants and trees. It will decrease the production of water vapor which has a tendency to lead to water shortages if it is exploited [6].

5. AIR QUALITY (AIR POLLUTION)

- According to the World Health Organization (WHO), air pollution is composed of a mixture of chemical, physical, biological or any substance that alters the natural characteristics of the atmosphere [10]. Through that mixture, some chemicals are harmful to humans and may lead to serious health problems that have a tendency to slowly put an end to a person's life through diseases. WHO claimed that forest fires are one of the contributors to air pollution [10]. Through the act of deforestation, it explains that the loss or removal of trees through deforestation will worsen the quality of air and lead to air pollution. Trees and plants were the one who cleans air through the process of plant respiration, but since trees and plants were removed, this will affect and worsen the quality of air that us humans breathe.

IMPACTS OF DEFORESTATION TO A PERSON'S HEALTH

1. CHRONIC ILLNESSES

- Chronic illnesses also known as Chronic Diseases are long-lasting conditions which slowly progress and can have a persistent life-long impact on a person's health. Common examples of Chronic Diseases are:

- **Cardiovascular diseases** - diseases that deal and affect the cardiovascular system, diseases including heart failure, artery disease, high blood pressure, and stroke.
- **Respiratory Diseases** - diseases which damage a person's respiratory system such as blockage or obstructing airflow leading to breathing difficulties, and asthma where airways become narrow which makes it harder to breathe.
- **Cancer** - involves uncontrollable growth of additional cells, it is a serious type of chronic disease and difficult to treat if not discovered early, most common types of cancers were lung, breast, colorectal, and prostate cancer.

2. INFECTIOUS DISEASES

- Diseases carried by insects and animals may spread through physical contact with a person and can infect another person resulting in a pandemic. When forests are cleared, wild animals and insects from the rainforests will lose their houses resulting in evacuating or roaming throughout the planet in order to find a new shelter. Example of these diseases are:

- **Vector-Borne Diseases** - Diseases carried by insects such as mosquitoes and ticks, may increase the intensity of dengue and malaria when forests were cleared having the result of shelter hunting which has a potential for them to invade houses in urban or rural areas spreading diseases.
- **Zoonotic Disease** - Diseases that jump from animals to humans. When trees from the forests are removed, humanity will come into closer contact to the wildlife encountering animals that have a tendency to spread a disease to people like ebola, COVID-19, and Lyme disease.

3. NUTRITION AND FOOD SECURITY

- Trees and plants are the main producers of foods that are rich in nutrition and mainly contribute to human health ensuring nourishment. Deforestation will affect these positive contributions of the forests to human's health, resulting in a decreased and limited supply of nutritious food for humans.

4. WATER POLLUTION

- Deforestation will lead to soil erosion and increased runoff causing the land to deteriorate easily which may carry water pollutants into water bodies affecting the water's quality and hygiene that can cause serious health problems when consumed by a person.

References:

[1] Pachamama Alliance. n.d. Effects of Deforestation

[Source: <https://pachamama.org/effects-of-deforestation/>]

[2] American Museum of Natural History. (n.d.) Changing Atmosphere

[Source:

<https://www.amnh.org/exhibitions/climate-change/changing-atmosphere#:~:text=A%20warming%20atmosphere%20affects%20more,powerful%2C%20sometimes%20provoking%20dangerous%20floods.>]

[3] NASA

<https://science.nasa.gov/climate-change/what-is-climate-change/>

[4] Rainforest Trust

[Source:

https://www.rainforesttrust.org/our-impact/rainforest-news/devastating-truths-of-deforestation-and-how-you-can-help/?utm_source=google-grant-uk&utm_medium=search&utm_campaign=our-impact-uk&utm_term=rainforest%20deforestation&gad_source=1&gclid=CjwKCAjwx-CyBhAqEiwAeOcTdVQjW7NfEb-juPGUOInp3fYkN9O_AL2d8TBkV0899ghCYqkPy1HcURoC8EQQA_vD_BwE]

[5] TrapBag

[Source:

<https://trapbag.com/deforestation-flooding/#:~:text=Does%20Deforestation%20Cause%20Soil%20Erosion,or%20washed%20away%20by%20rain.>]

[6] WorldWildLife

[Source: <https://www.worldwildlife.org/threats/deforestation-and-forest-degradation>]

[9] NationalGeographic

[Source: <https://www.nationalgeographic.com/environment/article/deforestation>]

[10] World Health organization (WHO)

[Source: https://www.who.int/health-topics/air-pollution#tab=tab_1]

Causes (reasons as to how deforestation still persists)

Direct causes of deforestation are agricultural expansion, wood extraction (e.g., logging or wood harvest for domestic fuel or charcoal), and infrastructure expansion such as road building and urbanization. Rarely is there a single direct cause for deforestation.

Underlying Causes

Although poverty is often cited as the underlying cause of tropical deforestation, analyses of multiple scientific studies indicate that that explanation is an oversimplification. Poverty does drive people to migrate to forest frontiers, where they engage in slash and burn forest clearing for subsistence. But rarely does one factor alone bear the sole responsibility for tropical deforestation.

References:

Causes of Deforestation: Direct Causes

[Source:https://earthobservatory.nasa.gov/features/Deforestation/deforestation_update3.php#:~:text=Direct%20causes%20of%20deforestation%20are,single%20direct%20cause%20for%20deforestation.]

SOLUTION

Though deforestation has its good reason to be implemented like producing houses, road widenings, making materials made up of woods, etc. it doesn't mean that humans can just exploit that kind of behavior because it will result in our own destruction. To make this activity reasonable, there should be rules and limitations before this kind of activity such as laws which prevent illegal logging or replacing the removed tree with another tree seed. Through this, it may

contribute to decreasing the human exploitation to deforestation and will preserve the ecosystem that will ensure the quality of health of the planet.

ADDITIONAL

Topic: DEFORESTATION

Key points to Research:

1. Definition of Deforestation

- Deforestation overview

2. Impacts on

- Environment

- Overall Health

- Globalization

- Societal Development

- present statistical data of its impacts

3. Effects on

- Environment

- Overall Health

- Globalization

- Societal Development

- present statistical data of the effects

4. Causes

- reasons as to how deforestation still persists

<https://education.nationalgeographic.org/resource/deforestation/>

https://www.rainforesttrust.org/our-impact/rainforest-news/devastating-truths-of-deforestation-and-how-you-can-help/?utm_source=google-grant-uk&utm_medium=search&utm_campaign=our-impact-uk&utm_term=rainforest%20deforestation&gad_source=1&gclid=Cj0KCQjw3tCyBhDBARIsAEY0XNkNmHcM_ybo_QQWCSOjvEWpYW3gli9lpfkmQzu7ta9vPod4Y18aohoaAtSDEALw_wcB

Deforestation can result in more carbon dioxide being released into the atmosphere. That is because trees take in carbon dioxide from the air for photosynthesis, and carbon is locked chemically in their wood. When trees are burned, this carbon returns to the atmosphere as carbon dioxide. With fewer trees around to take in the carbon dioxide, this greenhouse gas accumulates in the atmosphere and accelerates global warming.

Deforestation also threatens the world's biodiversity. Tropical forests are home to great numbers of animal and plant species. When forests are logged or burned, it can drive many of those species into extinction. Some scientists say we are already in the midst of a mass-extinction episode.

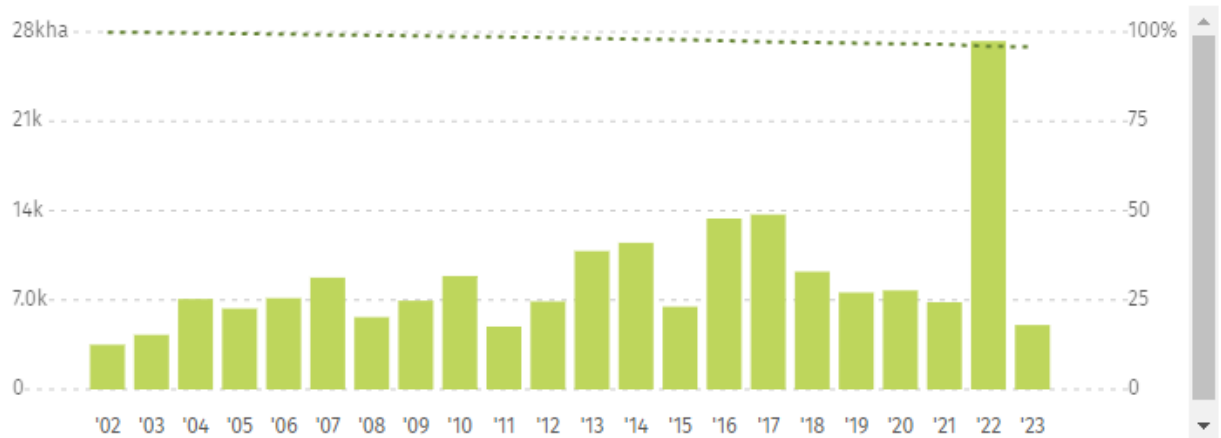
More immediately, the loss of trees from a forest can leave soil more prone to erosion. This causes the remaining plants to become more vulnerable to fire as the forest shifts from being a closed, moist environment to an open, dry one.

While deforestation can be permanent, this is not always the case. In North America, for example, forests in many areas are returning thanks to conservation efforts.

PRIMARY FOREST LOSS IN PHILIPPINES



From **2002** to **2023**, **Philippines** lost **190 kha** of **humid primary forest**, making up **13%** of its total tree cover loss in the same time period. **Total area of humid primary forest in Philippines decreased by 4.1%** in this time period.



The methods behind this data have changed over time. Be cautious comparing old and new data, especially before/after 2015. [Read more here.](#)

2001 primary forest extent remaining | >30% tree canopy

<https://www.globalforestwatch.org/dashboards/country/PHL/>

According to globalforestwatch

Deforestation is a serious problem affecting many countries worldwide; the Philippines is no exception. The country is home to a vast array of unique flora and fauna, but deforestation has put many of these species at risk of extinction. Over the years, the Philippines government has implemented various programmes and initiatives to combat deforestation and promote reforestation, but the battle is still ongoing. In this article, we will explore the progress made by the Philippines in the fight against deforestation, the challenges it faces, and what more needs to be done.

<https://www.green.earth/blog/the-philippines-battle-against-deforestation-progress-and-challenges>

According to National Geographic, there are about 30% of rainforests left undamaged throughout the world's land area. The earth has lost 420 million hectares or about a billion acres of forests since the year 1990, the loss of those forests is at an alarming rate which can be susceptible for global warming when it is aggravated. The Food and Agriculture Organization of the United Nations stated that 17% of Amazonian rainforests in Africa and South America were destroyed over the past 50 years, and the loss percentage is still rising and persists meaning the deforestation activities still occur. By the year of 2020, the Amazon Conservation Org. had reported that the destruction percentage rose by 21% which is comparable to the size of Israel [9].

Geographically, Bicol Region itself has a total land area of 17,362 square kilometers, of which 13.80% are irrigable area. <https://region5.nia.gov.ph/?q=overview-nia-region-5>

> Deforestation is a process of removing, destroying, or clearing land by dismantling plants and trees for various reasons due to the trees' special characteristic that makes them versatile for many applications when processed into fuel, materials, appliances and furniture, and many more.

>NAT GEO, aprox. Only 30% of rainforests are left undamaged, Earth has lost 420 million hectares or about 1 billion acres of forests since the year 1990. The loss brings about many connected problems such as global warming, greater damage done by calamities, extinction of species, and possibly even humans too in the future if left unattended, and other problems that are likely to arise and worsen due to deforestation.

>In fact a natural wonder of the world despite the many organizations and laws that protect it is not safe from deforestation. The Amazon rainforest. According to the Food and Agriculture Organization of the United Nations, lost 17% of its density during the past 50 years, and at 2020, the Amazon Conservation Org reported that the damage due to deforestation had increased to 21% which is similar to the land area of Israel which is aprox. 22,145 (22.1k km²) km² or we could also compare it to Bicol Region/Region V but combining it to the land area of Nueva Ecija which is equal to 17,362 (17k km²) km² + 5,689 km² (5.7 k km²) which totals to aprox. 22.7 km² although exceeds the land area of Israel by approx. 600 km², but in actuality, this is possible since the study was done 4 years ago.

IMPACT ON THE ENVIRONMENT

> Deforestation has been an ongoing trend for many centuries now and probably has been occurring since the earliest of times and earliest civilizations, but the rate at which deforestation has been happening over the past few centuries has increased significantly due to the boom of civilization and many advancements in revolutions and age, a significant increase of population and other related variables all took a toll on the rate and severity of deforestation.

> First on the list is Global warming and climate change. Before diving any deeper let us first define the distinction between the two. According to Nat Geo "Global warming is the long-term warming of the planet's overall temperature." climate change according to merriam-webster "significant and long-lasting change in the Earth's climate and weather patterns"

> But how does deforestation contribute to global warming and climate change? According to a non profit organization called wwf or world wide fund for nature, Trees absorb and store carbon dioxide. If forests are cleared, or even disturbed, they release carbon dioxide and other greenhouse gases back into circulation and back into the atmosphere. They also stated that deforestation is a factor that contributes to approximately 10% of the overall cause of global warming.

> And a study done during the height of el nino earlier this year showed that at the Arroceros Forest Park in Manila, they recorded a significant 3 degree celsius drop in temperature compared to the other parts of Manila. This simple study shows that forests indeed reduce the temperature and increase the humidity of the surroundings.

> Next is extinction, we know that forests are home to numerous life forms such as fungi, bacteria, plants, animals, and even humans. Deforestation causes the destruction of habitat, food source, and the natural order of organisms in the ecosystem, so It is to no surprise that deforestation causes extinction and puts the equilibrium of the ecosystem in a great imbalance. According to an article published by The Philippine house clearing mechanism, Due to massive deforestation, about 50 to 100 species of animals are being lost each day which eventually will lead to extinction.

> EROSION is the process where soil is being carried away through natural forces such as wind and water. it is majorly a bi-product of deforestation. the trees and plants hold the soil in place and prevent erosion from happening, and because of deforestation, the chance of erosion due to variables such as typhoons and earthquakes becomes a serious hazard especially if it could damage property, agriculture, affect the economy, and claim life. Soil erosion not only changes the landscape of the land, but it also makes the soil dead which leads to food insecurity. Erosion also pollutes water bodies and could lead to blockage in the path of water which could lead to drought.

>DROUGHT is a natural climate cycle that can happen anywhere in the world. It is a disaster where the land or an area lacks precipitation that leads to water shortages, and it can be a serious problem, especially to our health, environment, economy, and agriculture. Deforestation also affects the evaporation levels, which dries up the moisture in the air and throwing off the balance of the water cycle. If the cycle of dry air, low humidity, and decreased precipitation it would ultimately lead to a drought climate. This is a major problem since we know that the Philippines relies heavily to its agricultural sector, and this affects farmers, the country's economy, and the common people.

>AIR QUALITY, forests are like the natural lungs of the Earth, they absorb and purify various gases such as carbon dioxide in the atmosphere and in turn, give back oxygen through the process of photosynthesis. But due to deforestation, an imbalance of carbon emission ratio and other air pollutants increase making the air quality unsafe for some countries such as Bangladesh which is dubbed as the world's most polluted country. Cleaner air quality brings about many positive benefits such as improved water quality, lower concentration of greenhouse gases, and improved overall health.

- Erosion, according to National Geographic, is a geological process where soil is being carried away through natural forces such as wind or water. Soil erosion can lead to soil infertility which has a significant contribution to affecting or destroying the crop yields. Deforestation has a big factor leading the soil to lose its support, which are trees and plants that help the soil to hold its place, once it is removed it will be easily washed away by flood and blown by wind [5].

Deforestation also has a negative impact on both human health and the environment. Deforestation is a process of clearing or removing trees for some reason but it will lead to consequences like global warming, increased carbon dioxide emissions, air pollution, etc. This segment will be discussing the impacts of deforestation in our health and in the environment.

1. GLOBAL WARMING / CLIMATE CHANGE

- One of the causes of deforestation is the rising of temperature affecting the air causing heatwaves and drought, this phenomenon is called Global Warming and it became a common phenomena in the present day [2]. It has been observed since the pre-industrial period until today due to human activities that are affecting the earth's atmosphere such as fossil fuel burning that leads to permanent and regrettable consequences [3]. The statement above helps the people to realize the devastating effect and mass destruction that it will give to our planet and to our species.

(CLIMATE CHANGE)

- <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>
- <https://climate.nasa.gov/vital-signs/global-temperature/>
- <https://www.nationalgeographic.com/science/article/the-decade-we-finally-woke-up-to-climate-change>
- <https://news.abs-cbn.com/news/2024/4/25/manila-s-last-lung-cooler-than-other-parts-of-the-city-1948>

For every decade starting from the year 1850 the global temperature has increased by 0.1 F* or 0.06 C* according to NASA, NAT GEO, ETC.

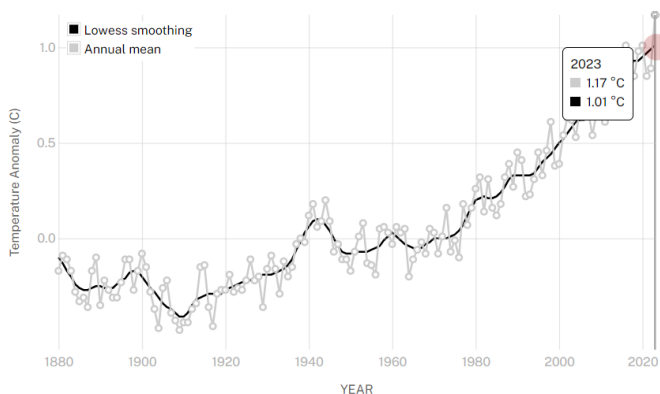
The Arroceros Forest Park located in Manila which is dubbed as “Manila’s last lung” showed a significant 3* C drop in temperature during the height of El Nino compared to the other places in Manila.

(EXTINCTION)

- <https://standfortrees.org/blog/deforestation-effects-on-animals/>
- <https://www.earthandanimals.com/advocate/wild-earth/params/post/1278141/deforestation-on-clearing-the-path-for-wildlife-extinctions>
- <https://worldrainforests.com/deforestation/2000/Philippines.htm#>
- <https://www.philchm.ph/deforestation/>
- <https://www.green.earth/blog/the-philippines-battle-against-deforestation-progress-and-challenges>

(EROSION)

- <https://news.abs-cbn.com/news/06/21/23/marcos-457m-tons-of-quality-soil-lost-yearly-due-to-erosion-degradation>



Click+drag to zoom Reset

Get Data: [HTTPS](https://climate.nasa.gov/data/) | Snapshot: [PNG](#)

Key Takeaway:

The 10 most recent years are the warmest years on record.

This graph shows the change in global surface temperature compared to the long-term average from 1951 to 1980. Earth's average surface temperature in 2023 was the warmest on record since recordkeeping began in 1880 (source: NASA/GISS). NASA's analysis generally matches independent analyses prepared by the National Oceanic and Atmospheric Administration (NOAA) and other research groups. Overall, Earth was about 2.45 degrees Fahrenheit (or about 1.36 degrees Celsius) warmer in 2023 than in the late 19th-century (1850-1900) preindustrial average. **The 10 most recent years are the warmest on record.**

The animation on the right shows the change in global surface temperatures. Dark blue shows areas cooler than average. Dark red shows areas warmer than average. Short-term variations are smoothed out using a 5-year running average to make trends more visible in this map.

The data shown are the latest available, updated annually.

Other 2023 rankings included...

- warmest year on record for land and ocean areas individually;
- warmest year on record for both the Northern and Southern Hemispheres (land and ocean areas combined),
 - warmest year for land and ocean individually in the North,
 - 2nd-warmest year for land and warmest year for ocean in the South;
- 40th-warmest year for the Antarctic.

Past and future change in global temperature

Though warming has not been uniform across the planet, the upward trend in the globally averaged temperature shows that more areas are warming than cooling. According to NOAA's [2023 Annual Climate Report](#) the combined land and ocean temperature has increased at an average rate of 0.11° Fahrenheit (0.06° Celsius) per decade since 1850, or about 2° F in total. The rate of warming since 1982 is more than three times as fast: 0.36° F (0.20° C) per decade.

According to the latest Synthesis Report ([pdf](#)) from the Intergovernmental Panel on Climate Change, there is no debate about the cause of this warming trend:

Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 in 2011-2020.

23

14 National Centers for
ed among the 7 warmest for that
(June-December) were each their
bal temperatures were more than
ne in NOAA's record any month has