

Environmental Issues & Justice in Zambia:

Climate Change, Deforestation, Pollution, and Water Supply

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Climate Change

- Climate change describes a change in the average conditions, such as temperature and rainfall, in a region over a long period of time. Scientists have observed that Earth's surface is warming, and many of the warmest years on record have happened in the past 20 years.
- In 2022, Zambia had one of the coldest winters in over 20 years and prior to that (2021), Zambia had the shortest rainy season in over 30 years. The weather has become unpredictable.
- In discussing Climate Change it is obvious that we will talk about the weather in some way or the other. Therefore, before we can discuss Climate Change we need to understand the terms "Weather" and "Climate".
- Most often the two words are used interchangeably, However, in technical terms the two words are different.

The Weather



Weather is “***the atmospheric conditions of a specific place at a particular time***”.

Weather is expressed in form of **Temperature** (max and min in °C), **Cloud Cover** (Sunny, cloudy or partly cloudy), **Rainfall** (showers, downpour, thunderstorms or without thunder), **Wind speed** (Km/h) or **Humidity** (which is the moisture content in the air)

A combination of the above is what makes up the weather of the place in question.

Weather measurements are specific to a particular place and time, and this means that the weather of two different places can be different on the same day and at the same time. That is why we sometimes it can rain in Cheston, whilst it would be dry in Town.

Climate

Climate *is a weather pattern of a particular place, country or region*”, which is expressed in form of seasons (and each season has a specific weather), e.g. Zambia has a **Savannah type of climate**, which has a **dry season**, and a **wet (rainy) season**

The beginning of the dry season has cold weather, while the beginning of the Rainy season has a hot weather.

These season will follow a specific sequence which is constant. For instance we know in Zambia:

1. The wet or ***rainy season is between November and April.***
2. The ***dry season is between the May and October***
3. In the dry season there is there are ***months with a cold weather (between May and August).***
4. There are also ***months with a hot weather (between September and December).***
5. On the transition between the cold and warm weather it is usually ***windy (mid July to mid September).***

The constant weather patterns or climate is important because it enables people to plan when to perform different types of activities.

For instance, Maize which is Zambia's staple food is grown in the wet season, therefore all stakeholders need to plan for the farming season in advance.

1. Farmers must have the fields ready at the beginning of the wet season (November).
2. Those in charge of distributing farming inputs must ensure that the inputs reach the farmers at the correct time (Seed and Basal Fertilizer must be available by November).

3. Crops must be harvested and stored before the onset of the rainy season.

If any of the above does not happen at the correct time, there would be a catastrophe (poor harvest or crop going to waste)

We are able to plan for these because we know which months are dry and the months in which it will rain. We also know which crops will grow in Zambia and the crops that cannot grow in this country. (We have seen how people have unsuccessfully tried to grow apples and grapes in Zambia)

Local Weather



Global Climate



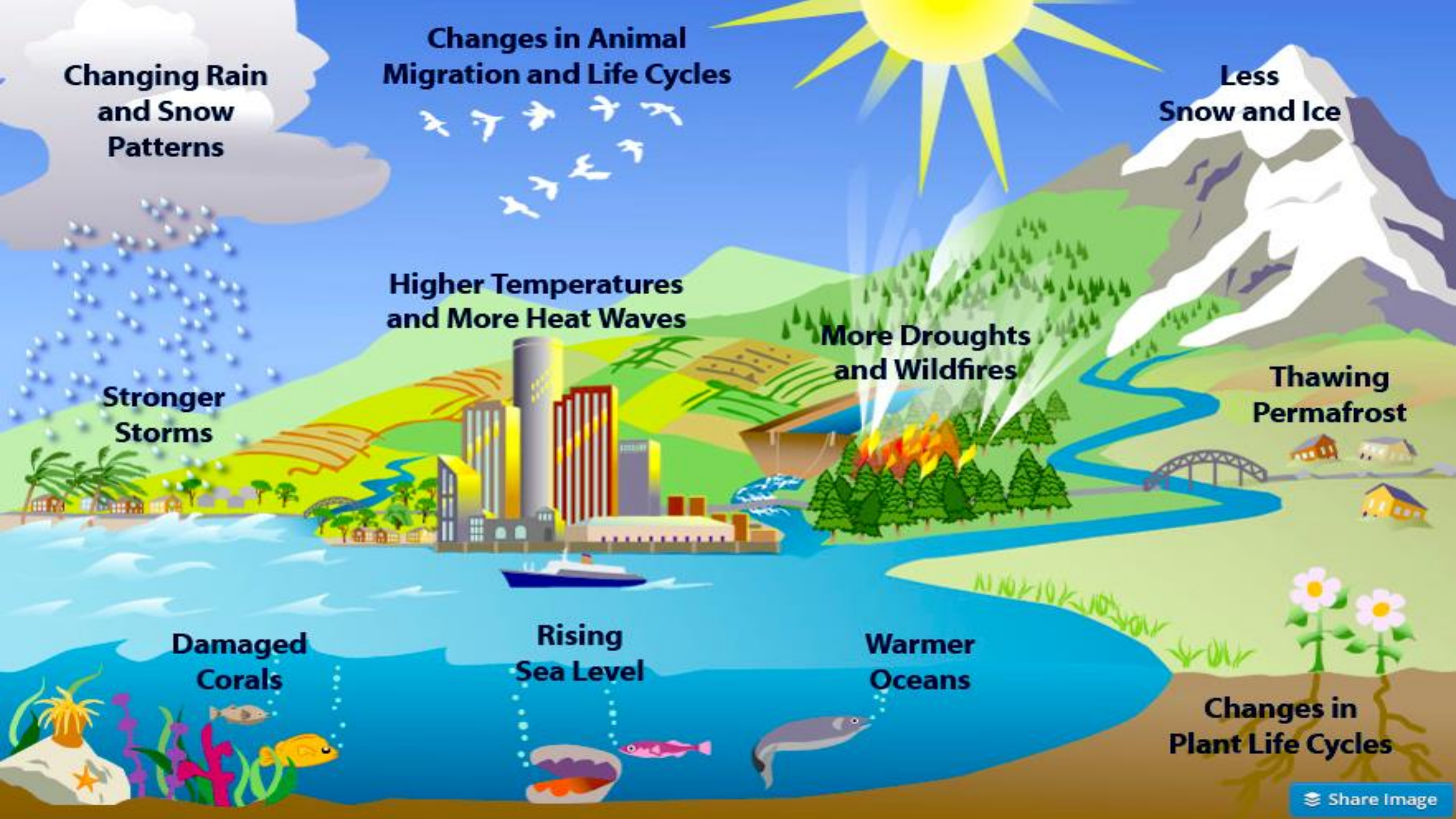
CLIMATE CHANGE

In the past few years scientists have noted that climate (weather patterns) has been gradually changing.

On a global level the following have been noted:

1. The temperature of the earth has been rising. The earth has become warmer hence the term global warming.
2. The Oceans have also become warmer, disturbing the species within the oceans and causing tropical storms as the air above them becomes warmer.

3. The ocean levels have been rising causing floods and in some cases islands have been submerged.
4. Ice glaciers have been melting, further increasing the water levels in the oceans.
5. Rainfall patterns in many areas have changed, which has made it difficult for many crops to grow.



**Changing Rain
and Snow
Patterns**

**Changes in Animal
Migration and Life Cycles**

**Less
Snow and Ice**

**Higher Temperatures
and More Heat Waves**

**More Droughts
and Wildfires**

**Thawing
Permafrost**

**Stronger
Storms**

**Damaged
Corals**

**Rising
Sea Level**

**Warmer
Oceans**

**Changes in
Plant Life Cycles**



Zambia being part of the global village has also been affected by global warming.

1. Weather records indicate that Zambia's annual temperature has increased by 1.3°C between 1960 and 2010 and this figure is expected to rise to 3.4°C by 2040.

a) This entails the extinction of some plants, insects, small animals and microorganisms, especially the ones that live in the ground.

2. Rainfall has decreased by 1.9mm per month per decade; this means that in the last decade rainfall has been reducing by 19mm of rain each year. –

a) this entails low water tables, receding water levels in rivers and lakes, which means less water for irrigation, electricity power generation, fishing and tourism. It also entails higher incidences of dry bore holes.

3. Farmers in the eastern and southern parts of the country, which are the major contributors of Zambia's food basket, have noted shortened growing seasons and the trend is constantly increasing. If this goes beyond a certain threshold, most crops including maize will be failing to mature.

4. Long periods of droughts within rainy seasons have also been noted resulting in stunting of crops and in some cases crops drying in the field.
5. Coupled with the long periods of droughts within a rainy season we see heavy downpours after the drought, causing floods (this happened in the southern parts of Zambia during the 2017 to 2018 farming season).

Such rain is of very little use as the damage to crops (stunting or drying) would have already happened and most of this water just runs off into rivers without sinking to the ground and contributing to the underground water systems.







We can see that Zambia is also affected. Climate Change impacts in Zambia have been noted particularly in land based activities.

Droughts, seasonal/flush floods, and extreme temperatures have affected both humans and the ecosystems.

There has been damage to crops others washed out by floods and others failing to grow (deepening food insecurity and poverty).

We have also noted the negative effects on energy production (load Shedding), and negative effects on water supply and quality.

CAUSES OF CLIMATE CHANGE:

Scientists all over the world have reached an overwhelming consensus that Climate Change is real and ***caused primarily by human activity.***

Human action and the way we are managing the environment is the major cause of climate change. We are polluting the air, rivers lakes and oceans. We are cutting down trees indiscriminately and we are disturbing both land and marine life. In some cases we are even interfering with wetlands and river systems

Human Activity producing gases, most of which are hazardous to the environment.



Greenhouse Gases:

Actions such as burning of fossil fuels (which include coal, oil, natural gas, petrol and diesel) is releasing an excess of Carbon Dioxide (CO₂) into the atmosphere.

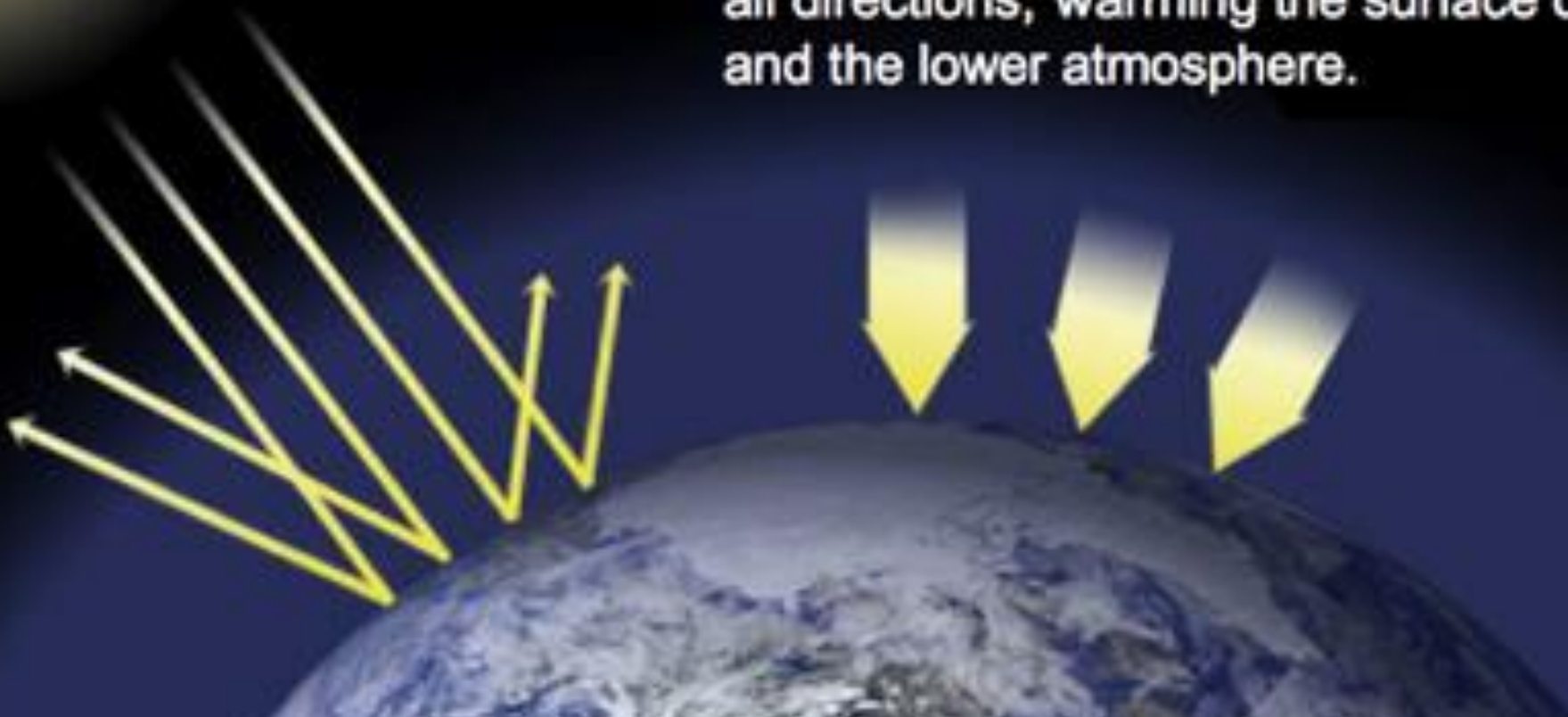
The CO₂ acts like a blanket and prevents excess heat from getting out of the earth's atmosphere.

The thicker the blanket, the warmer our planet becomes. At the same time, the Earth's oceans are also absorbing some of this extra CO₂, making them more acidic and less hospitable for sea life (there are people whose lives depend on fisheries).

This is known as green house effect.

Sunlight passes through the atmosphere and warms the Earth's surface. This heat is radiated back toward space.

Most of the outgoing heat is absorbed by greenhouse gas molecules and re-emitted in all directions, warming the surface of the Earth and the lower atmosphere.



The Greenhouse Effect



Atmosphere

Burning of Waste:

Burning of both domestic and industrial waste is also contributing to CO_2 and other greenhouse gases like Methane (CH_4) and Nitrous Oxide (NO_2), which have the same effects as described above.

We do not usually know the composition or what the things in our garbage are made of. Therefore, when we burn these substances, we don't know the emissions we are generating and releasing into the atmosphere.

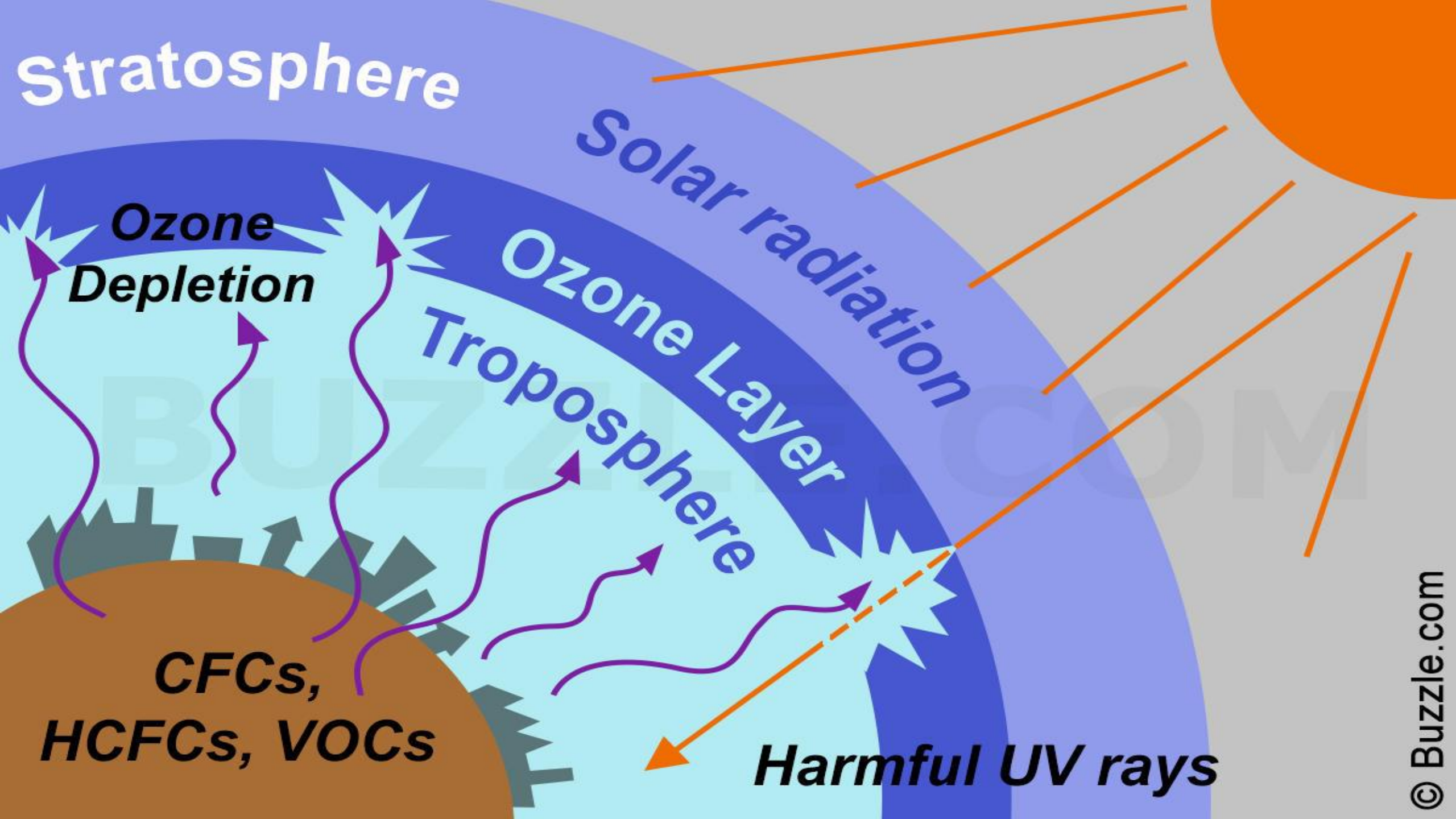


Depletion of the Ozone layer:

At the top of the earth's atmosphere, there is a gas known as Ozone, which is made up of oxygen atoms joined together in a cyclic form and its atomic formula is O_3 .

The ozone layer traps radiation (specifically Ultra Violet rays or UV Rays) from the sun. A small amount of UV rays are required for formation of vitamin D in our skins and photosynthesis in plants.

Excess amounts cause harm to our bodies (cancers) and contribute to the warming of the earth. During the past century human beings have been producing and using harmful substances including Chlorofluorocarbons (CFC), Hydro Chlorofluorocarbons (HCFC) and other Volatile Organic Compounds (VOCs).



Stratosphere

Solar radiation

Ozone Depletion

Ozone Layer

Troposphere

**CFCs,
HCFCs, VOCs**

Harmful UV rays

EFFECTS OF OZONE DEPLETION

SKIN AILMENTS



Buzzle.com

DISTURBED PLANT LIFE-CYCLES



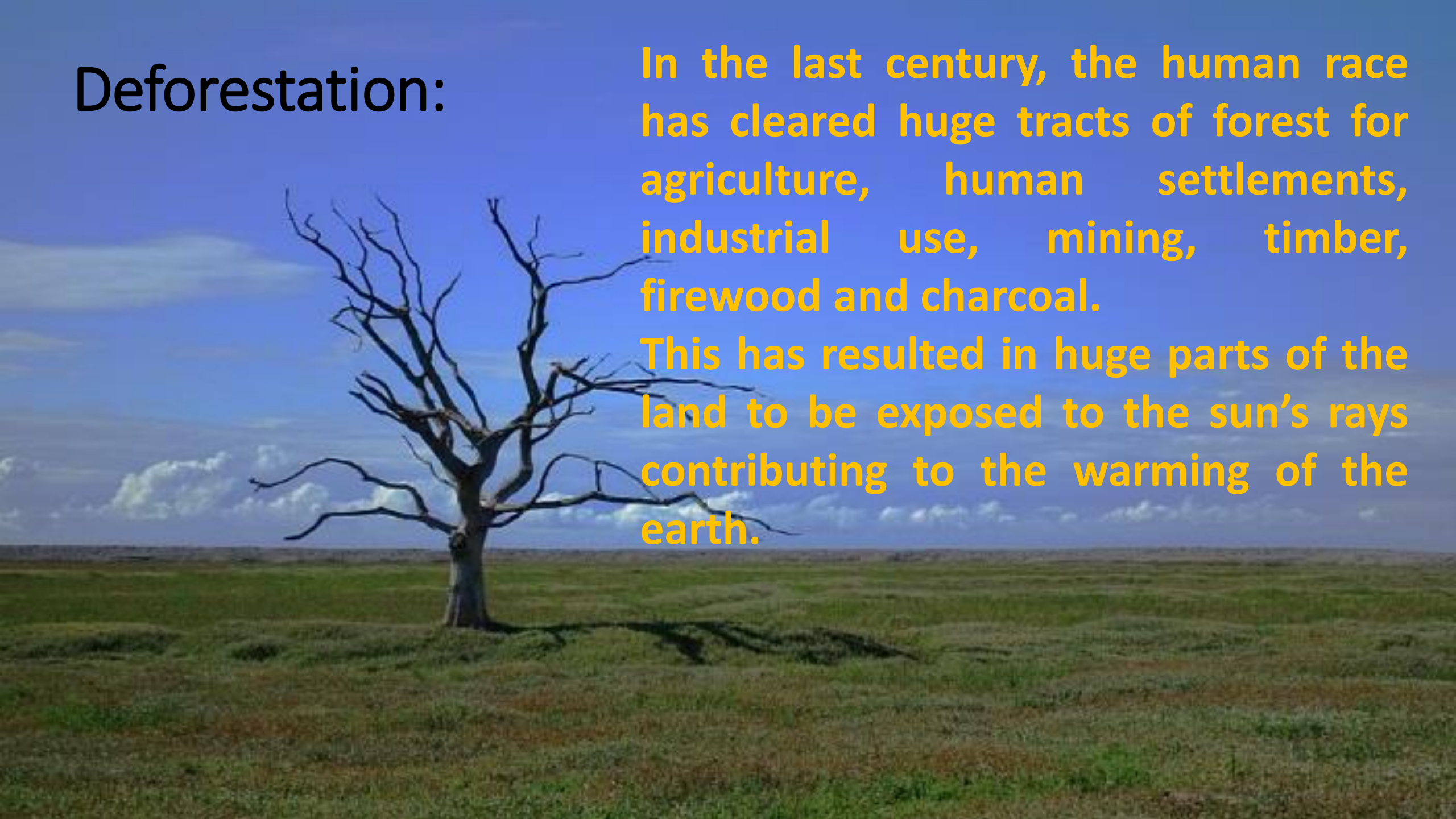
DESTRUCTION OF MARINE LIFE



Deforestation:

In the last century, the human race has cleared huge tracts of forest for agriculture, human settlements, industrial use, mining, timber, firewood and charcoal.

This has resulted in huge parts of the land to be exposed to the sun's rays contributing to the warming of the earth.



Deforestation:

This has caused disturbances in rainfall patterns. We all know that it rains more where there are forests and less in bare land.

However, when it rains, where there is no vegetation, most of the water runs off the ground taking with it the top soil (which is important for agriculture) leaving unproductive soil, a process called “Soil Erosion”.

If this continues for some time the place becomes a desert, a term called desertification.



ENVIRONMENTAL DEGRADATION AND POLLUTION

Environmental degradation is another phenomenon which is happening to the earth primarily **as a result of human action**. It is defined as ***“any harmful disturbance to the environment, which are undesirable”***. Environmental degradation and pollution, like climate change, affect the ability of the earth to sustain life.

It is the deterioration of the environment manifested through:

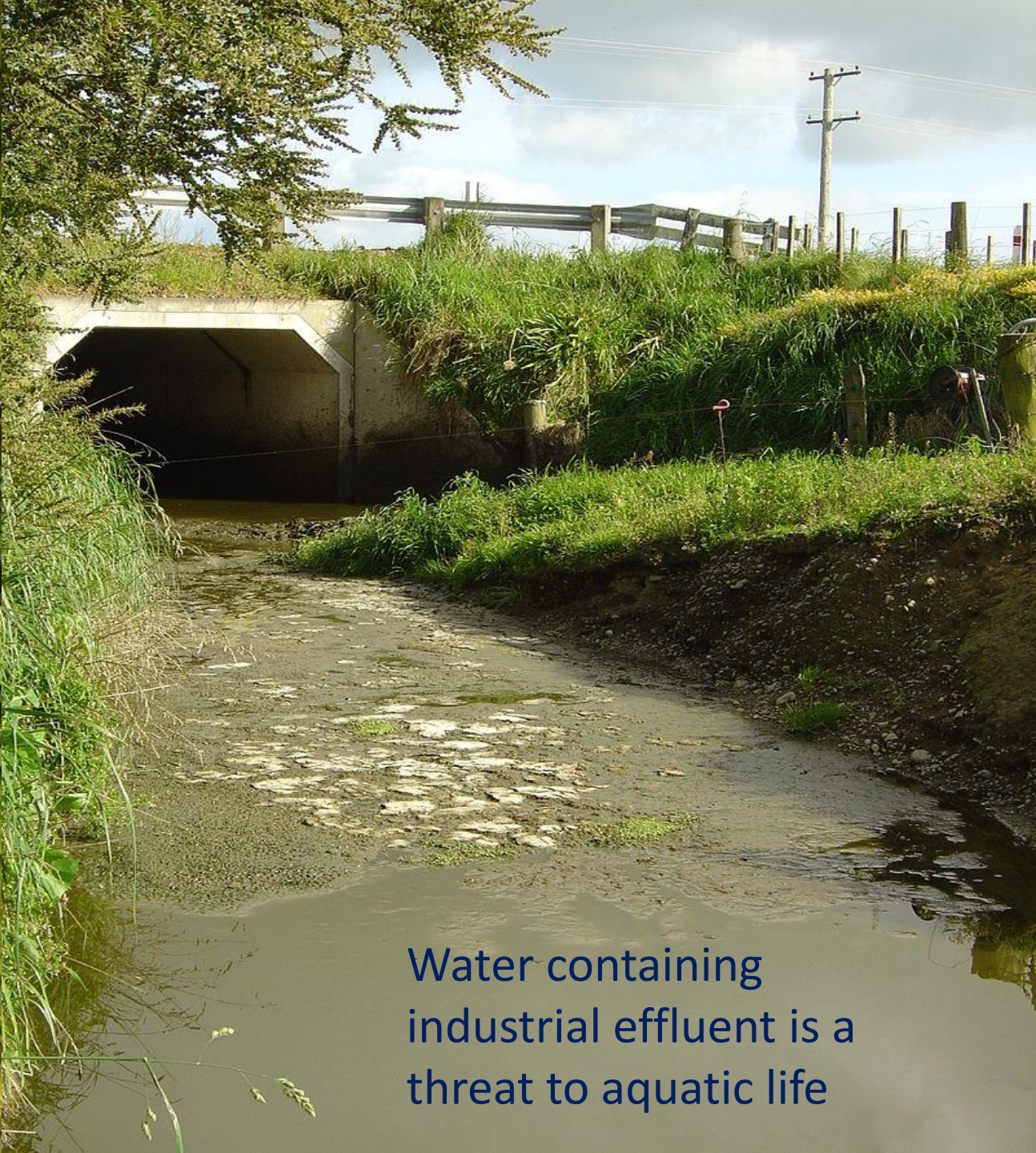
1. depletion of resources such as air, water and soil;
2. the destruction of ecosystems;
3. habitat destruction;
4. the extinction of animal species, wildlife and micro-organisms; and
5. pollution.

The major contributors of environmental degradation have been:

- 1. *Industrialization*** – where large tracts of land have been cleared to pave way for these industries. The same industries have been the major contributors of both air, water and land pollution.
- 2. *Mining*** especially open pits, which requires a large area of vegetation to be cleared and pave way to the mining activities. The mining activity itself involves disturbing the land, which makes it unusable for a long period of time.
- 3. *The process of separating the minerals from the ore*** also uses a lot of toxic chemicals and once these are released into the atmosphere, either as gases or effluent, they cause pollution and degrade the land and water sources, with harmful effects on the plants, humans, animals, micro-organism and wildlife.

Open pit mining: After the mining activities this land will become unusable.





Water containing industrial effluent is a threat to aquatic life

4. **Deforestation**, which is the clearing of forest, either for the purpose of farming, housing, road construction and energy. When forest are cleared indiscriminately, the resultant can be soil erosion, desertification and disturbance in rainfall patterns. Such land is not productive and can not sustain life.





Charcoal burning and trade is another source of desertification

Poor Waste Management: is another source of pollution leading to environmental degradation.



Not only does poor waste management make places look filthy, such places become breeding places for diseases such as Cholera and produce greenhouse gases such as NO_2 and VOCs, which deplete Ozone.







How are we managing our environment?

What is causing our actions towards the environment?

Environmental Justice

Environmental justice refers to the equitable distribution of burdens and benefits in the use and exploitation of goods and natural resources that are of common interest, such as land, water and air.

In legal terms, this concept ensures equity in resolving environmental conflicts and seeks the active participation of the people involved or affected by decisions made about the environment.

The use and exploitation of the elements of nature go through decisions that often produce conflicts or differences between interest groups. For example, it is necessary to decide how to distribute the available water in a territory among different social and environmental uses, such as human and animal consumption, the maintenance of ecosystems, and productive uses for agriculture, mining, industry, and others.

Environmental Justice

In ensuring environmental justice are usually put in place for example the water in Lake Kariba is used for various purposes such as power generation, potable water to be used in homes, fisheries and tourism.

To ensure that there are no conflicts among the various stakeholders, an entity which is co-owned by the governments of Zambia and Zimbabwe, known as the Zambezi River Authority regulates how much water each of the power stations and water utilities should use during a particular period.

This is to ensure that whilst electricity generation is going on and water utilities are maintain water supply to homes, there should enough water remaining to sustain the fisheries and the tourism industry.

If there are not handled well, conflicts arise. E.g. in Namwala, at one time an irrigation project was proposed but because it was going to take away land for cattle grazing, which is a major source of livelihood for the people, people protested and the project could not be implemented.

Environmental Justice

Usually, environmental justice will warn about the unequal distribution of burdens and benefits for the people affected in decisions on the use of natural assets and will demand the significant participation of all these affected people in decisions related to the environment. This is an example of the environmental justice issues.

Environmental Justice will also involve compelling individuals or entities that are responsible for environmental degradation to come up with measures to redress the situation or compensate affected individuals or communities.

The government in 2018 came up with the ***Extended Producer Responsibility Act***. This is the act through which the banning of packaging plastics of less than 30 microns was effected in Zambia as well as the banning of free distribution of plastic packaging material.

It also compels producers to put in measure to ensure that their processes and products do not cause harm to the environment.

The role of environmental justice is to enforce the application of the right to health and a healthy environment for citizens. It guarantees equal access to nature's resources and decisions about environmental issues.

Environmental justice is essential in the fight to improve and maintain a safe and healthy environment. It is especially for those who have traditionally lived, worked, and played in the areas closest to contaminants.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Zambia has tremendous natural resource wealth but faces increasing threats to its environment, including deforestation, wildlife trafficking, poor solid waste management, soil degradation as well as air and water pollution.

Deforestation - The current annual deforestation rate is 250,000 to 300,000 hectares per year and estimates place the country third globally for having the largest deforestation rate.

There two types of deforestation:

The first one is temporary deforestation, in which the natural forest regenerates, once land is abandoned, and this is associated with various forms of traditional shifting cultivation systems and charcoal production where stumps, roots, seedlings and seeds are not completely destroyed during forest clearing and subsequent cultivation. This type of deforestation does not necessarily lead to land degradation. However, it makes the land not to be fully usable for some time.

SOME ENVIRONMENT ISSUES IN ZAMBIA

The second one is permanent deforestation - Zambia is associated with commercial and semi-commercial farming, in which land clearing involves the uprooting of trees and deep ploughing with machinery or ox-driven implements that eliminate natural sources of forest regeneration. With good soil conservation measures, even this type of deforestation need not result in land degradation, although forest recovery occurs over a longer period than is the case with temporary deforestation.

Land-use change and forest loss are the main contributors to Zambia's greenhouse gas emissions. Deforestation rates are significant in Zambia, with approximately 300,000 ha of forest cover lost per year. Wood extraction (Mukwa, Rose Wood and Mukula), agricultural expansion, infrastructure development and fires are the main drivers of deforestation and forest degradation.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Charcoal production is considered one of the primary causes of forest degradation in Zambia and the main cause of carbon stock loss from forests in the country.

Land clearance for agriculture is the primary cause of forest cover loss.

A number of challenges need to be overcome to improve the management of forests in Zambia, these include:

1. low institutional capacity for forest monitoring,
2. limited knowledge regarding forest resources and carbon stocks,
3. technical challenges such as mapping forest degradation caused by charcoal production in complex dry woodland ecosystems.

SOME ENVIRONMENT ISSUES IN ZAMBIA

There are also other forms of wood extraction from forests. These include, fuelwood removal, logging and charcoal production.

Timber is also extracted from Zambian woodlands for construction and manufacture of wood products.

Although logging is said to be lower than charcoal production, which is the biggest single driver of wood extraction and the primary cause of forest degradation logging has been increasing at an alarming rate and has caused some tree species such as Mukula to be considered among the endangered species.

If not well regulated deforestation, could lead to desertification, especially in the western and south western parts of the country, which are characterised by sandy soils.





SOME ENVIRONMENT ISSUES IN ZAMBIA

Poor Solid Waste Management - Globally, around 1.3 billion tons of garbage is generated each day. This translates into each city dweller generating about 1.2kg of Garbage daily. It is estimated that this will increase to 2.2 billion tons by 2025, due to the continuous increase of the population, changes in lifestyle and increasing urbanization.

Solid Waste Management (SWM) is a major public health concern worldwide as poor management of waste not only leads to declining environmental health conditions but also contributes to disease outbreaks such as Cholera.

Zambia's waste generation rates were approximately 0.52 kg per person daily. While this may seem modest compared to the 1.2 kg per person generated world wide, the municipalities in Zambia do not have sufficient equipment to collect garbage. The councils are characterised by inadequate garbage management budgets, thereby worsening waste management and sustainable disposal and treatment.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Zambia Environmental Management Agency (2011) argues that despite the existence of a national Solid Waste Management strategy, the growth of the urban population and increased economic activity had resulted in an accumulation of waste.

In Lusaka, which is the country's largest city, less than 20% of the solid waste is treated after disposal, causing an inherent risk of environmental susceptibilities, due to the failure to sort waste.

According to the Lusaka City Council, only 30% of the solid waste generated in the city is disposed of at the designated dumpsites and treated in a sustainable environmental manner.

This poor waste disposal intensifies public health issues, especially during the rainy season, when outbreaks of various diseases like cholera and dysentery, are generated in most densely populated areas of Lusaka and other cities.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Waste disposal is a critical stage in SWM as well as ensuring the waste is taken to the right disposal site. However, the most critical stage is waste treatment.

Over recent years, the municipalities in Zambia have faced a number of problems including inadequate disposal areas and unsustainable treatment methods such as failure to correctly carry out the sanitary landfill method at dumpsites, un-managed burning and uncontrolled burying of waste.

The implication of burning waste include air pollution and production of poisonous gases. The practice goes further to increase prevalence of respiratory diseases as well as exposing people to the dangers posed by the explosion of spray cans when exposed to fire.

Uncontrolled burying of waste also leads to pollution of the environment and underground water systems

SOME ENVIRONMENT ISSUES IN ZAMBIA

Poor disposal of non-biodegradable wastes like plastics is also harmful to the environment and it is widely recognized as a major environmental burden.

The most common method for waste treatment in Zambia is landfilling such as the Chunga Dumpsite. In landfilling, a layer of waste would be levelled and covered with a thin layer of soil. In burying waste, the aim is to decompose the waste. However this results in the production of green house gases, responsible of the green house effect.

Greenhouse effect is one problem of poor waste disposal, but contamination through improper waste disposal is also problematic.

Burning of waste without incinerators created air pollution and risked fire breakouts or explosions. There have been such incidences among scavengers at the dumpsites.

None of the dump sites have recycling facilities and there is no segregation of waste from the source to facilitate recycling.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Water and Sanitation - Zambia aims for universal access to safe and affordable water and sanitation services by 2030. Yet, Zambia is one of the countries that missed the MDGs for water and sanitation and is projected to miss the more ambitious SDGs. Access levels remain stubbornly low as the data and a visit to many densely populated peri-urban quarters or rural villages quickly show. As of 2020, only two-thirds of Zambians had access to basic water services, and about half had access to basic or limited sanitation. These access rates have remained almost stagnant over the past fifteen years. You would be right to blame low public investment in the sector as the reason for this slow progress

Nearly half the population live in urban areas and this is expected to grow. Most low-income families in major towns and cities still rely on privately-owned boreholes or shallow wells, where water is expensive and often contaminated with raw sewage.

SOME ENVIRONMENT ISSUES IN ZAMBIA

Access to improved sanitation in the capital city Lusaka has fallen over the last 15 years, and over half of the population currently lack access to even a basic sanitation service. This means they need to use on-site sanitation services such as pit latrines and septic tanks instead, which can contaminate nearby water supplies leading to cholera outbreaks.

In most cities the majority of the areas with being opened up for development have no piped water supplies and have no sewer network. This means that every household have to use either wells and boreholes with septic tanks and soak away systems for sewage disposal. This has lead to contamination of ground water sources





Women and girls are the most affected when there is poor water supply as they have to walk long distances to the water points



In some cases they have to get water from water Kiosks, which they have to pay for, and some are not able to afford paying for the commodity