

January - March 2023 | Issue 1 | Volume 3

# EARTHHERO



• Climate Change •



# The Science Behind Climate Change

(All images from Pixabay)

Climate change is a complex phenomenon with multifaceted causes. We have reached a point where we can no longer ignore the devastating impacts of climate change and its effects on our planet. In order to properly address the issue and take action to lessen its impacts, it is important to grasp the various factors that lead to climate change. In this article, we will explore the key scientific factors that contribute to climate change and their impact on our planet's climate system.

Scientifically, it is widely recognized that human activities are the primary drivers of climate change. One of the main activities that badly affects the environment is our quest for energy, specifically our reliance on fossil fuels. Our reliance on fossil fuels starts in the early 1900s, with the discovery of large oil fields and the development of technology to extract and refine these fuels. The invention of the automobile in the early 20th century further increased our dependence on fossil fuels. The vast majority of cars, trucks, ships, airplanes, and other vehicles run on petrol, diesel, or other fossil fuels. These fuels are used to power engines and transport goods and people across the globe. According to the International Energy Agency (IEA), there were around 1.2 billion vehicles on the world's roads in 2020. This number is expected to increase to 2 billion by 2040, leading to a significant rise in carbon dioxide emissions which would further exacerbate the problem.



In addition to transportation, the burning of fossil fuels for electricity generation also contributes significantly to greenhouse gas emissions. Fossil fuels, especially coal and natural gas, are still the dominant sources of electricity in many countries. Malaysia for example generates more than 90% of its energy from petroleum, gas and coal. They are burned in power plants to generate electricity, which is then distributed to homes, businesses, and factories. We use electricity every day to keep our house cool, charge our mobile phone and power electrical appliances. In large-scale manufacturing, many industrial processes require large amounts of energy. For example, the production of cement, steel, and other materials relies heavily on fossil fuels. As we burn fossil fuels, they release carbon dioxide and other greenhouse gasses such as carbon dioxide, methane and nitrous oxide into the atmosphere.



These gasses trap heat from the sun, leading to an increase in global temperatures and changes in climate patterns. According to the Intergovernmental Panel on Climate Change (IPCC), the global average temperature has already increased by about 1°C above pre-industrial levels, and is continuing to increase at a rate of roughly 0.2°C per decade. While a 0.2°C increase per decade may seem small, even small changes in global temperature can have significant impacts on the environment, such as rising sea level, melting of polar ice caps, and more frequent and severe weather events.

Other human activities that fuel climate change are deforestation and land use change. Deforestation contributes to climate change by reducing the number of trees that absorb carbon dioxide from the atmosphere through photosynthesis. Forests act as carbon sinks by absorbing carbon dioxide from the atmosphere and storing it in biomass. When forests are cleared or burned, this carbon is released into the atmosphere, contributing to greenhouse gas emissions and global warming. According to the data from the Food and Agricultural Organization of the United Nations (FAO), in the period between 2010 and 2020, the world lost an average of 4.7 million hectares of forest every year. Tropical forests have been particularly damaged by deforestation in certain geographical areas. According to the FAO, the rate of forest loss in tropical regions was almost 10 million hectares per year between 2015 and 2020.

In 2021, Malaysia alone lost 123,000 hectares of its natural forest. The forests are mostly cleared for agriculture or urban development purposes. Less forest leads to a rise in temperature. Natural habitats such as forests and grasslands reflect more sunlight than developed area such as cities



and industrial sites. Land use changes that reduce vegetation cover can lead to an increase in the amount of solar energy absorbed by the Earth's surface, contributing to warming. This is the reason why the temperature in the forest is cooler than the city area. Unsustainable land use can also impact the water cycle and lead to changes in local and regional climate patterns. For example, deforestation can reduce the amount of moisture that is released into the atmosphere through evapotranspiration. This moisture helps create rain and affects the weather patterns in the area. If there are fewer trees because of deforestation, there might not be as much moisture

released into the air, which could lead to less rain and different weather patterns than what we're used to seeing in that area.

Understanding the scientific factors that contribute to climate change is essential for developing effective strategies to mitigate its impacts and safeguard our planet's future. Failure to do so can lead to habitat destruction and biodiversity loss, particularly in sensitive areas such as rainforests, coral reefs, and the Arctic ecosystems. We must prioritize the reduction of greenhouse gas emissions through the implementation of clean energy solutions, sustainable land use practices, and conservation efforts. It is crucial that we take action to reduce our carbon footprint and transition to a more sustainable future. We need to change our unsustainable lifestyle and be more mindful of our consumption and spending. We can all make individual choices to conserve energy, reduce waste, and choose eco-friendly products.

However, it is not just individuals who need to take responsibility for addressing climate change. Governments, businesses and industries also have a crucial role to play in addressing climate change. Governments must implement policies and regulations that prioritize the reduction of greenhouse gas emissions, invest in clean energy technologies, and incentivize sustainable practices across all sectors. Businesses and industries must also take responsibility for reducing their carbon footprint by adopting sustainable practices, investing in renewable energy sources, and transitioning towards more environmentally-friendly operations. In order to effectively address climate change, it will require a collective effort from all sectors of society. By working together and taking action, we can create a more sustainable future for ourselves and future generations. It is important that we act now to address climate change, as the impacts of global warming will only become



more devastating if we do not take immediate action. There is only one earth and we must act now to protect it.