

Free essay on global warming

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Introduction

In recent years due to the rising temperature of the globe we have seen an increase in the number of natural calamities affecting us. Tsunami in Japan and Indian Ocean, Katrina in Southern United States and Icelandic volcanic eruption are few of them. The average temperature of the earth is on the rise. We hear a lot of concerns voiced against the man induced causes of global warming. It is one of the topics that concern one and all in the world. Is it a fact or is it a myth? We will try to discuss and establish in the next few pages of this essay that earth is warming not due to natural causes but due to anthropogenic causes.

How Earth keeps heat?

Before we go into the details of global warming we need to understand the basic science behind how the earth warms up or cools down from the sunlight. When sunlight enters the earth's atmosphere it encounters a layer of ozone gas almost 20 kilometer above the earth surface. Ozone layer is transparent to normal light spectrum, so it lets the light pass through itself while absorbing the UV lights. All the high frequency UV rays are absorbed by the Ozone layer with rest of the normal spectrum light hitting the earth surface. When light hits something very smooth and glossy like ice, it reflects the light back to the sky and the earth surface, generally, does not get heated up. However, if light hits a rough or dark surface like a muddy ground then the light gets absorbed, heating up the surface. The earth surface absorbs light and then radiates heat (Infrared energy). Heat, unlike light rays, is absorbed by air. When light is absorbed by the ground, heat is

generated and heat in turn is also absorbed by the atmosphere giving rise to what we call temperature. This is the basic physics behind how the earth keeps itself warm from the sunlight.

Global Warming a fact or myth?

There are lots of debates over the topic of global warming all across the world. Most of the people especially the environmentalists believe that global warming is happening and the earth is getting hotter with every passing year whereas there are people who believe that earth is not at all getting warmer and even if it is, that is because of the natural causes. Let's have a look at some of the facts to see if we can say that our mother earth is getting hotter with every passing year or not.

Global temperatures were recorded in most of countries of the world starting in the second half of the 19th century and whatever temperatures were recorded in last 100 years shows that the average surface temperature of the earth have gone up by 0.74 ± 0.18 °C between the period 1906 to 2005. However, the temperature rise was much severe during the second half of the 20th century than the first half. (Trenberth et al., Observations: Atmospheric Surface and Climate Change, p. 244, 2007). Is this small temperature rise unnatural? Many scientists believe that it is an unnatural rise. With the use of different indirect techniques of collecting temperature data, it was found out that the temperature of the earth is relatively stable and very few years of extreme fluctuations apart the average temperature remained almost same for the last 2000 years. (Jansen, What Do Reconstructions Based on Palaeoclimatic Proxies Show? pp. 466–478).

Also, we have seen and heard many other evidences across the world. The

widespread melting of the arctic ice, rise in sea level, increased temperature of the oceans and early spring phenomenon like flowering of the plants (Rosenzweig, C., et al., Assessment of Observed Changes and Responses in Natural and Managed Systems, p. 99) are surely indirect indications of global warming.

Even if we look at the average temperature data of recent years vs. the temperatures of the first few decades of the 20th century we see much hotter years in 21st century than during the last century. In fact in last 120 years, among the 13 warmest years 11 of those fall between 2000 to 2011. National climatic data center for US shows the years 1998, 2003 and 2010 as recorded to be the three hottest years in the world history (UK Met Office, 2009). This definitely tells us one thing that the average temperature in the recent past has gone up than it was 100 years back.

The temperature increase pattern is uniform almost all over the globe. The land temperature has gone up, so did the average ocean temperature. Because of higher specific heat capacity of water the temperature rise on the ocean bed is slower than the temperature rise on the land. Since 1979 the land surface temperature has gone up by 0.25 degree per decade against 0.13 degree of the ocean temperature rise (Meehl, Gerald A.; et al. "How Much More Global Warming and Sea Level Rise", 2007).

Causes of Global warming

It is almost an established fact and also we have seen in the previous section of the essay that the average temperature of the earth has increased over last few decades at a rapid pace. There are three different schools of thought on this issue. The first category, the biggest one of the lot, believes that in

recent years because of the manmade causes the earth temperature has escalated rapidly and it is not a natural phenomenon. The second school of thought believes that the earth temperature has gone up but not because of the manmade causes, rather due to natural causes. A third school of thought suggests that the small temperature rise happens every now and then in the earth's atmosphere and we do not have much evidence to say that it is a significant rise of temperature and something like this never occurred in the past. We will try to discuss all the points that are put forth by those three groups and see what makes most sense among all the evidences.

The biggest group of all who believes that global warming is a manmade phenomenon argues that the major reason for global warming is an increase in greenhouse gases in the atmosphere. Greenhouse gases help the earth absorb and keep heat near the lower atmosphere of the earth surface. Water Vapor, CO₂, Methane, CO, and Ozone are the main greenhouse gases found in the natural atmosphere. With the normal percentage of those gases in the air, the earth tries to maintain an average temperature of around 59°F.

However, an increase in the percentage of greenhouse gases contributes to the retention of more heat in the atmosphere resulting in warming of the planet. Over the last two centuries, we have burnt a lot of fossil fuels (Coal, Oil) for running automobiles, industrial machines and power plants.

Consequently, the percentage of greenhouse gases has gone up in the air; especially the percentage of CO₂ has doubled and that of methane has almost tripled. Average temperature of the earth surface during this period has shot up by more than 2°F. (Schmidt, Gavin " Water vapor: feedback or forcing?". Real Climate, 2009). It is evident now that the greenhouse gases in

the environment have gone up in the atmosphere causing the earth to absorb and retain more heat and that is the main cause of global warming. However, there is a huge argument in social media about the validity of this theory. The data is consistent and the theory seems the most suited one to describe the current global warming trend but before coming to any conclusion we also will like to take a look at other arguments.

The group which believes that it is a natural phenomenon and earth changes its temperature pattern in every few thousand years presents periodic Ice Age phenomenon as one of the evidences to validate their points. It is also a well augmented truth that earth goes through temperature changes based on natural causes like sun flares, El Nino, Volcanic activities and chemical weathering. However, many of those processes like chemical weathering are very slow process and take millions of years to cause any significant temperature change in the atmosphere. Earth's orbit position around the sun is also given as a reason of the temperature changes in earth. Even in the movie " The Great Global Warming Swindle" there was many facts like the above presented and supported by some section of scientists. The above causes are the main factors of global warming and greenhouse gases are just a very small contributing factor. However, immediately after the release of the movie a large section of the scientific community criticized it for showing data which are outdated and partial. But let's say for arguments sake, if we take that argument to be correct, then the earth actually should have been cooling than warming as currently earth is taking one of the longer elliptic routes around the sun. Sun flares are also not known to be changed or increased much in last few decades to explain the recent

temperature rise. (Global Climate Change, pp. 15-16, 2009). These reasons like, earth orbital cycle, sun flares, chemical weathering all attribute to global temperature rise or fall but they do it at a very slow pace over thousands of years. In the current scenario the average temperature of the earth has shot up significantly in a very short span of time which only can be explained by the man-made causes such as burning of excessive fossil fuels to create huge greenhouse gases in the atmosphere.

The group which believes that we should not be thinking that earth is warming up opines that the average temperature changes of few degrees are not uncommon for earth in every few thousand years and it will take care of itself on its own and manmade causes are insignificant compared to the natural forces of earth. However, most of the proponents of this theory is social media and nonscientific community. They probably do not want to believe that our small actions can harm the environment to such a big extent.

Conclusion

In recent years, as our understanding of the nature is getting better, we are able to measure even the minute changes taking place around us more and more accurately. Few decades back there was a strong argument that phenomenon like Milankovitch cycle (earth's distance from the sun and earth's tilt) which occurs every 160, 000 years and sun spots and flares are more responsible for global warming than manmade causes. However, with very accurate data available from satellites, modern sophisticated observatories and hi-tech meteorological offices we can conclude with firm conviction today that whatever may be the other reasons for global warming;

the significant rise in temperature of the earth in recent decades is caused by an increase of greenhouse gases in the atmosphere. It is a warning sign for all of us and we should be very responsible in our way of dealing with nature in future. We should try to incorporate more green ways of leading life and less fossil fuel burning such as gasoline, coal and diesel will definitely help global warming to reduce. Finally we can conclude by saying the words of Leonardo Di Caprio from the Movie 11th Hour

“ Global warming is not only the number one environmental challenge we face today, but one of the most important issues facing all of humanity We all have to do our part to raise awareness about global warming and the problems we as a people face in promoting a sustainable environmental future for our planet.”

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