

## **Global Warming, Climate Change and Impact on Life Supporting Systems**

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Earth's atmosphere extends up to 50 km comprising of troposphere (up to ~20 km) stratosphere (20-50 Km) make Earth an inhabitable planet. The troposphere is comprised of normal atmosphere with varying degree of atmospheric constituents of the air all living organisms breath. This air due to increased level of anthropogenic (man-made) emissions exceeding the permissible limits, cause air pollution, global warming and climate change. This will have impact on human health and earth's radiation balance. In the stratosphere the ozone layer act as a protecting barrier in prevent the incoming ultraviolet radiation and ensuring the Earth from harmful radiation. The Sun's radiation reaching the Earth's surface passes through atmosphere and creates some degree of warmth due to absorption of short-wave radiation. The radiation absorbed by the Earth's surface is emitted back as long-wave radiation and generally maintains equilibrium of incoming and outgoing radiation. This is referred as Earth's radiation balance. However, the increasing debate of-late since the industrialization is on increased levels of anthropogenic emissions making the Earth's atmosphere with elevated levels of Green House Gases (GHGs) primarily CO<sub>2</sub>, Methane, Nitrous Oxide etc. These gases absorb long-wave radiation and act as a shield preventing the radiation escaping from the atmosphere thereby the Earth's atmosphere gets warmed up. This is known as Global Warming. The persistence of elevated levels of GHGs results in increased Earth's average temperature, which can perturb the climate and the total atmospheric circulation pattern, a carrier for energy and water cycles. These climatic changes have severe implications on agricultural production, glacier melting, impact on monsoons; increased disasters like cyclones etc. The presentation highlights some of the basic issues related to global warming and climate change and role of satellites in addressing crucial climate change questions.