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Climate Change Remediation

How can we improve climate change all over the world?

Temperature changes and weather patterns over extended periods of time are referred to as "climate change." Solar cycle variations, for instance, might account for some of these modifications. Human activity has been the major contributor to global warming due to the use of fossil fuels such as coal, petroleum, and propane. The combustion of fossil fuels raises the global average temperature by trapping the sun's heat in a layer of greenhouse gasses. Two greenhouse gasses that contribute to global warming are carbon dioxide and methane. For example, using gasoline to power a car or wood to heat a building adds to these. Carbon dioxide emissions may also be caused by deforestation and other land clearance. Dumpsites often produce methane. The biggest polluters are power, manufacturing, transport and storage, housing, farming, and land usage. Every nation on every continent is feeling the effects of global warming. It's causing havoc on economies and people all around the world. Changes in weather patterns and increasing sea levels are causing severe weather occurrences. The COVID-19 pandemic's travel limitations and economic decline are expected to reduce carbon emissions by around 6%, although this is only temporary. Global warming is not a stop button. Emissions are projected to rise after the global economy has recovered from the epidemic. To save people's lives and livelihoods, we must move quickly to solve the outbreak and the climate crisis.

A Review of Recent Advances in Carbon Capture, Storage, and Utilization Technologies Environmental Chemistry Letters, vol. 19, no. 2, Springer International Publishing, 2020, pp. 797–849. https://doi.org/10.1007/s10311-020-01133-3.

This peer-reviewed article, which focuses on greenhouse gas capture, provides analytical remediation for global warming through simulations. An honest step-by-step analysis of the project to capture greenhouse gasses, as well as any difficulties encountered during its implementation on a global and commercial scale, is provided in this review. A thoughtful article that outlines strategies for carbon reduction, including renewable resources, recycling, and dumping in geological formations such as underground pits and aquifers.

There has been a rise of more than 1 degree Celsius over pre-industrial rates as a result of an increase in carbon dioxide emissions, the primary greenhouse gas. This has contributed to climate change. Pre-combustion, oxyfuel combustion, and post-combustion are the three main methods of carbon capture that we will discuss in this paper. The capture, storage, and utilization of CO2 are all discussed in this article. A comparison was made between carbon capture technology and CO2 separation processes. Because of its high regenerative power of 3.5 GJ per ton of CO2, monoethanolamine is the most widely used carbon sorbent for CO2 regeneration. According to the researchers, unique solvents have been discovered using a new sorbent method, including a modulated-amine mix that requires only 2.17 GJ per ton of CO2 to regenerate. Graphene-type materials have a CO 2 adsorption capacity of 0.07 mole/g, significantly higher than that of activated charcoal, zeolites, and metal-organic framework. A cost-effective and long-term solution is to use CO2 geosequestration, which can store collected CO2 in rock formations with a global retention base-load of Gt during operating timelines and has an average global retention base-load of GT. While global total gross anthropogenic CO2 emissions are more than 32,000 million tons per year at the moment, the world's total gross anthropogenic CO2 consumption is less than 200 million tons per year, according to the World Resources Institute. This section will discuss CO2 utilization techniques that use direct pathways, such as beverage carbonation, food packing, and oil recovery, as well as indirect ways, such as chemical plants and fuels. Additional CO2 consumption alternatives were investigated, including the use of CO2 for base-load energy production, temporary power storage, area lounging, and cryogenic airflow CO2 selection in tandem with hydropower, among other items. The findings were published in the journal Science. According to bibliometric mappings, novel and stable ionic liquids, the crystalline size and uniqueness of metal-organic compounds, and the sorption capacity of revolutionary solvents are all topics that need to be explored in the long run to further our understanding of the world. Pilot and commercial-scale trials in fields such as techno-economic evaluation of innovative solutions, engineering, and dynamic modeling will need further work, research, and invention before being carried out on a large scale.

Arimura, Toshi H., and Shigeru Matsumoto. Carbon pricing in Japan Springer Singapore Pte. They were limited. 2020.

What could be better than putting a high price on something that is both harmful and necessary at the same time? This book discusses carbon pricing, a primary mitigation strategy for carbon emissions. The authors chose Japan as their case study because it is the third-largest economy in the world and a major automobile manufacturer. Because automobiles account for one-quarter of all greenhouse gas emissions, this study of Japan provides a solid foundation for climate change research.

This freely available publication examines the various climate change mitigation strategies used in Japan to combat global warming from the perspective of economics. It is available online. Despite the fact that numerous countries have implemented climate change policies in response to the severe problem of climate change, no comparative evaluation of climate change programs has been conducted. For a variety of reasons, including data limitations as well as political considerations, policy assessments in the Asia-Pacific region, in particular, lag significantly behind those in North America and Europe. Climate change mitigation and adaptation methods implemented in various industries across Japan, such as emissions trading and carbon taxation, are discussed and evaluated in the book's first section. This section looks at how government policies have influenced the behavior of businesses and families. There are also economical models included that take into consideration the potential of renewable energy sources. In the end, it examines the effectiveness of climate change mitigation initiatives in Japan and Western countries, among other things, on the basis of these in-depth investigations. Additionally, this book will appeal to both academics and politicians who are looking for cost-effective ways to combat global warming, as it will provide significant insights.

Preston, Christopher J., and Christopher J. Preston. *Engineering the Climate: The Ethics of Solar Radiation Management.* 2012, Rowman & Littlefield Publishing Group.

When it comes to intentionally engineering a milder climate to combat climate change, there are ethical difficulties to consider. Engineering the Climate: The Ethics of Solar Radiation Management addresses these issues. Climate engineering (also known as geoengineering) has recently received increased attention as a result of the growing likelihood that the international community will be unable to keep the temperature increases linked to carbon emissions under control at levels that are considered acceptable. For those who would be most adversely affected by climate change, the intentional modulation of solar radiation in order to combat global warming is an intriguing and optimistic technological possibility with the potential to provide significant benefits to those who would be most adversely affected by climate change. At the same time, the concept of geoengineering is causing a great deal of debate among scientists. It would be a historic step forward in environmental management if we could take deliberate control of the Earth's climate, but it would also raise a slew of difficult ethical questions in the process. In the field of geoengineering, solar radiation management (SRM) is a type of geoengineering that has been shown to be highly inexpensive and capable of bringing the temperature of the Earth down relatively quickly. However, due to the complexities of the Earth's climate, there is considerable uncertainty about the precise nature of SRM's impacts in various parts of the world. Given the likelihood of SRM, a number of ethical questions arise that are both difficult and contentious to resolve. This includes the uncertainty surrounding SRM's effect on rainfall patterns, the difficulty of maintaining appropriate worldwide involvement in inference, the legitimacy of purposefully attempting to manipulate the Earth's climate system in general, and the problem of establishing a credible scientific basis for climate change denial. A thorough and academic study of the ethical issues surrounding SRM is required before it can make fair and just decisions about whether (and how) to continue. We hope to make some progress toward that goal during the course of writing this book, which includes contributions from thirteen experts in the field of geoengineering ethics.

Conclusion

Nations that are most susceptible to climate change have generally been accountable for only a tiny fraction of global emissions. However, this is beginning to change. This raises concerns about the administration of equality and fairness. Climate change and sustainable development are inextricably intertwined. It becomes simpler to fulfill goals of sustainable development, such as eliminating poverty and decreasing inequality, when global warming is kept at a manageable level. The relationship is acknowledged in the United Nations Sustainable Development Goal, which calls for immediate action to prevent climate change and its consequences. Food security, clean water, and ecosystem conservation are all aims that have synergy with climate mitigation. Climate change has a complicated strategic context. As a free-rider issue, it has been described as follows: all nations profit from mitigation efforts undertaken by other nations, but member states would suffer if they switched to a low-carbon economy themselves. This way of presenting things has been called into question. For example, in virtually all places, the advantages of a coal transition stage for the healthcare system and natural ecosystem outweigh the costs of the transition.

Work Cited

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