

RENEWABLE ENERGY: A WAY TO MITIGATE CLIMATE CHANGE IMPACT

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ABSTRACT

Solving the climate change problems is the moral, economic, policy, political and technological challenge of the present generation. The change in climate pattern since the mid-20th century has been alarming. There has been a continuous increase of carbon dioxide level in the atmosphere along with other greenhouse gases due to human activities involving use of fossil fuels for the purpose of industrialization. This puts the survival of human race into jeopardy since it is what is turning the atmosphere dangerous. The fields of environmental laws, in particular, are called on to take action to adapt their protection to a changing, but also more dangerous and sensitive environment. The constitution also states the State's responsibility with regard to environmental protection has also been laid down under Article 48(A) and in relation to climate change, government has made various acts including the Air protection, energy conservation, etc. that help mitigate the change impacts. Ministry of new and renewable energy has also made a strategic plan for the year 2011-2017. Its main purpose is to promote production of energy by using renewable energy sources along with reducing the emission of carbon dioxide and other greenhouse gasses. India, being a developing country is not mandatorily obligated to reduce its CO₂ emission but on a comparative basis, it can be seen that developed countries like UK are mandated to reduce their CO₂ and greenhouse gas emission thus mitigating the impact of climate change. Concluding, I would like to suggest the renewable technologies are considered as clean sources of energy and optimal use of these resources minimize environmental impacts, produce minimum secondary wastes and are sustainable based on current and future economic and societal needs.

Keywords: Climate change impacts, renewable energy, greenhouse gasses, sustainable development, globalization, environmental laws

INTRODUCTION – CLIMATE CHANGE (CAUSES AND IMPACTS)

Climate change is now affecting every country disrupting the economies and affecting lives of most people in all communities. People are facing severe climate change impacts including but not limited changing weather patterns, rising sea level, and more extreme weather events.

The main cause of this change in climate is the emission of greenhouse gasses which is now more than ever. Greenhouse effect refers to warming of the surface of the planet that results when the atmosphere traps heat radiating from Earth toward space. Without action, the world's average surface temperature is projected to rise over the 21st century and is likely to surpass 3 degrees Celsius this century—with some areas of the world expected to warm even more.¹ Certain gasses are responsible for this greenhouse effect that include water vapor, carbon dioxide, methane, chlorofluorocarbons, etc. emission of these gasses can be due to burning of fossil fuels that in turn drastically impact the atmosphere and the ozone. Another cause of climate change is human activities itself. The industrial activities that our modern society depends upon have raised atmospheric carbon dioxide levels from 280 parts per million to 400 parts per million in the last 150 years as per IPCC² under United Nations. The panel also concluded there's a better than 95 percent probability that human-produced greenhouse gases such as carbon dioxide, methane and nitrous oxide have caused much of the observed increase in Earth's temperatures over the past 50 years. Studies also show that solar irradiance has impacted the climate patterns as it is rational to assume that variable energy output from the sun affects the climate of the planet³.

Due to this climate change, the poorest and most vulnerable people are being affected the most. The exposure to climate change is a real concern, particularly in developing countries, where food security is influenced by political, economic and social conditions in addition to climatic factors. If we see the agricultural sector in India, we can easily say that this sector is particularly vulnerable to present day climate variability, including multiple years of low levels of rainfall. The most recent report of the IPCC provides a

useful typology suggesting that vulnerability may be characterized as a function of three components: adaptive capacity, sensitivity, and exposure⁴. It is also seen that climate change will affect the potential for development in these countries, i.e., the potential of sustainable development of the countries. Thus there need to be a synergy between climate change policies and sustainable development agenda of developing countries to efficiently mitigate climate change impact.

RENEWABLE ENERGY AS A SOLUTION

In the present situation, where industrialization is prominent, the demand for energy supply is dominant, leading to a rapid growth in carbon dioxide (CO₂) emissions due to global use of fossil fuels. Greenhouse gas (GHG) emissions resulting from the provision of energy services have contributed significantly to the historic increase in atmospheric GHG concentrations. Recent data of IPCC⁵ confirm that consumption of fossil fuels accounts for the majority of global anthropogenic GHG emissions. Thus it is mandatory to come up with an option that fulfil the demand need as well as not harm the atmospheric conditions of the planet. Some of these possible options are energy conservation and efficiency, fossil fuel switching, renewable energy, nuclear and carbon capture and storage (CCS)⁶. A proper evaluation of mitigation options will inevitable involve study of potential of these alternatives as well as results after their practical application. Their contribution to sustainable development as well as social cost of its implementation is also a deciding factor.

Use of Renewable energy as a solution to the problem of variable climate pattern is a viable option as not only does it have the potential to mitigate the change impact, but it also have wider benefits. If the application of renewable energy technologies is proper and efficient, its use may contribute to:

- Social and economic development of the country it is used in. this is because technological advancements in any economy are considered as a sign of prosperity, growth and development. And use of technology will inevitably improve the state's productivity and efficiency without keeping the atmosphere at stake.

- Energy access. Because with the improvement in productivity, more amount of energy can be supplied to more number of people at the same time and there will be no simultaneous impact on the environment.
- A secure energy supply. As with technological advancements, there comes a surety that there will be a certain amount of supply in a given time period which cannot be ensured when done via traditional ways like burning of fossil fuels, etc. as their supply is limited unlike that of renewable sources like sunlight, wind, etc. which are natural sources and thus cannot cause any negative impact on the ozone and other atmospheric layers.
- Reducing negative impacts on the environment and health. This is the most prominent benefit because it is eco-friendly and thus doesn't cause any ill-effects to the climate and weather patterns. It also doesn't cause pollution and doesn't cause depletion in any resources that might become an obstruction to the future development. Also, since there is no pollution or emission of harmful gases, it also contributes to the maintenance of good health of those living in the society.

ENVIRONMENTAL LAWS IN INDIA – CLIMATE CHANGE IMPACTS

The rules and regulations related to environment in India have been prevalent since the Vedic period⁷. The Vedas and other scriptures recognize five natural elements as panchmahabhut for stavan, meaning worship. These five basic natural elements are water, earth, sun, air and sky. The people at that time recognized these elements as gods and goddesses and worshipped them. Even in the bhagwad geeta, there are sermons of maintaining ecological balance and sustaining nature. Since the time, the need to protect environment was already a concern and the impacts of climate change an important issue thus involvement of environment in the legislation was inevitable. The need for ensuring human security in Climate change through the protection of Human rights and promotion of good governance policies is one of the important aspects in development of rights based approach.

The constitution of India⁸ also provides for certain laws that are related to protection of the environment:

- Article 48-A of the constitution that is included in the directive principles of state policy reads as follows: "The State shall Endeavour to protect and improve the environment and

to safeguard the forests and wildlife of the country" It states the state's responsibility in the concerned matter.

- Article 51-A (g) reads: It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures.

Other government provisions and laws for climate change include:

- The Environmental Act⁹- it acts as an umbrella legislation that provides a frame work for Central government co-ordination of the activities of various central and state authorities established under various other laws that would help reduce climate change.
- The Air Act of 1981¹⁰ talks about climate change impacts under the Ozone Depleting Substances (Regulation and Control) Rules to enact procedural laws and regulations to reduce the emission of greenhouse gases in order to maintain a healthy climate.
- The laws related to energy consumption¹¹ states how to use energy efficiently with causing minimum damage to the atmosphere and the environment. It also provides for conservation of energy that further contributes in sustainable development.
- Electricity Act 2003¹², allows coordination with the power sector by providing a comprehensive framework for power development along with causing least harm to the atmosphere thus reducing the impacts of climate change.
- The Forest Act¹³ also consolidates the law relating to forests, the transit of forest produce and the duty livable on timber and other forest produce.
- Forest Conservation Act of 1980 provide for the conservation of forests and for matters connected. These forest laws are of importance to effects of climate change by indirect means as existence of forests plays an essential role in keeping the air pure.

The Ministry of new and Renewable energy plays the most important role in mitigating the climate change impacts. Its report in 2010¹⁴ had a theme of up-scaling and mainstreaming renewable for energy security, climate change and economic development. It recognized renewable energy as a catalyst to mitigate climate change impact if the right policy framework and financial tools. Even in its strategic plan¹⁵ for 2011-2017, it was explicitly stated that renewable energy is currently experiencing increasing vibrancy across all sectors of the economy driven by sustained economic growth and growing global concerns regarding climate change.

For concluding, it can be said that the continuous increase in greenhouse gasses in the atmosphere which leads to raised global temperatures causes changes in earth's climate and prevailing weather patterns, with startling consequence and thus Indian Government has enacted many climate change laws and policies but the policies of state should not harmful to development of present and future of developing countries, i.e., it's contribution in sustainable development as well.

REGULATIONS ON CLIMATE CHANGE ACROSS THE GLOBE

Climate change is a problem that is seen across the globe and thus to prevent its negative impacts, countries all over the world need to take some steps and measures. Just like the Indian government has made rules and regulations to mitigate greenhouse gas emission, other countries' governments have also added such rules in their legislations. Apart from their independent effort, various countries are also part of international conventions and treaties that are made to regulate climate change impacts by international organizations such as UNFCCC, etc.

In terms of laws in other countries, the implementation of rules and regulations depends from developed country to a developing country and the least developed countries (LDCS)¹⁶. For instance, the rule that emission of greenhouse gases and other atmosphere non-friendly gases should be none to minimal is in almost every country and the people in the states and United Kingdom and other developed countries are mandatorily supposed to follow it but for the people in India (a developing country) and South Africa (LDC) only need to make their best effort to reduce the gases' emission. There is no penalty if the rule isn't followed but it is considered as an ethical and moral duty of the people to reduce negative impact on the climate and the environment. This difference is present because unlike developed countries, developing and least developed countries don't have the means to get their CO₂ emission to zero and thus people cannot be held liable for the non-availability of technology required to ensure complete atmosphere protection. But it is important that such countries try their best to curb climate change impacts because even though the LDCs contribute the least to the emission of greenhouse gases, they are the most vulnerable countries to the effects of climate change and have the least capacity to adapt to these changes. They will be the first to suffer from a possible increase in natural disasters such as floods and droughts due to climate change.¹⁷

On the other hand, there are international conventions and treaties that ensure maximum support from countries to mitigate impacts of changes in climate and weather patterns for overall prosperity of the planet. The United Nations Framework Convention on Climate Change¹⁸ recognized the problem of climate change and bound its member states to act in the interests of human safety even in the face of scientific uncertainty. It set a goal to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system." The idea it set was that, as they are the source of most past and current greenhouse gas emissions, industrialized countries are expected to do the most to cut emissions on home ground. The Convention acknowledges the vulnerability of all countries to the effects of climate change and calls for special efforts to ease the consequences, especially in developing countries which lack the resources to do so on their own.

United Nations also included in its "goals for sustainable development"¹⁹, need to take urgent actions to combat climate change and its impacts. It stated that "climate change is a global challenge that does not respect national borders. Emissions anywhere affect people everywhere. It is an issue that requires solutions that need to be coordinated at the international level and it requires international cooperation to help developing countries move toward a low-carbon economy.

One agreement to address climate change, countries adopted the Paris Agreement²⁰ at the COP21 in Paris on 12 December 2015. In the agreement, all countries agreed to work to limit global temperature rise to well below 2 degrees Celsius, and given the grave risks, to strive for 1.5 degrees Celsius.

CONCLUSION

Concluding this paper, we can say that industrialization and globalization are responsible for increase in demand of energy supply in the economy. This increased supply in energy if is kept on being fulfilled through the traditional means and methods, i.e., burning fuel like coal, etc. it will have more social cost than social benefit. In other words the negative impact of increased production of energy will have a negative impact on the environment thus causing change in climate pattern. The most visible impact on climate is the effect of greenhouse gasses resulting in global warming. To curb such climate change issues, one of the most viable alternative to

energy supply is use of renewable energy. We can see that various provisions have been made to implement the technologies of renewable energy along with the already existing ones that regulate the renewable sources and provide for environment protection. In India and across the globe, the fact that there are regulations in the independent legislations of the countries show that the world is ready to accept renewable sources of energy instead of the traditional ones and think about the benefit of society, environment and the planet itself. Lastly, the involvement of most countries in international conventions is a way of the world to take a step together to curb the problems of climate change and other related issues.

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