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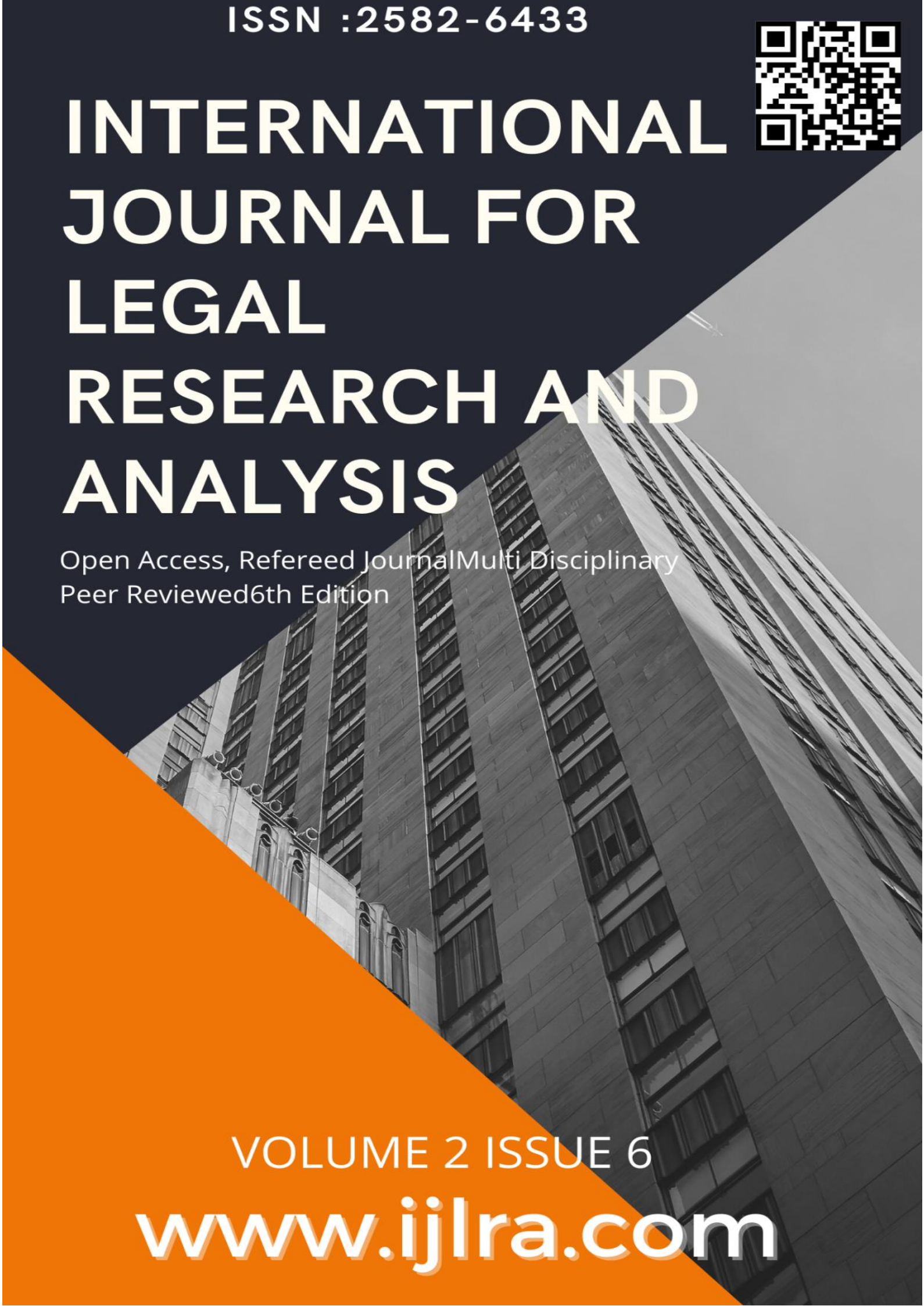

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REVERSING CLIMATE CHANGE THROUGH POLICY INTERVENTIONS

Authored By- Niraj Kumar Seth

"Scientific evidence for warming of the climate system is unequivocal"
- Intergovernmental Penal on Climate Change('IPCC')

Abstract

The phenomenon of climate change and its most significant contributors are explained with credible evidences and statistics in this essay. Policy interventions, both technological and natural, have been suggested to curtail the impact of climate change. Policymakers with responsibilities to implement those policies and steps required to implement them have been identified. The impact of climate change can be curtailed with appropriate policies, well-funded research, technological solutions and community participation. A well-designed policy, implemented in a timely manner and at affordable cost can bring the required change.

Keywords: Climate, Change, Policy, Technology, Intervention

Introduction

Climate change is a global environmental phenomenon that is mainly caused by greenhouse effect. Some gases, called Green House Gases ('GHGs) when released in the Earth's atmosphere, trap sun's incoming heat by not allowing it to be reflected back into space, almost like a greenhouse. The results are global warming, rising sea levels, shrinking ice sheets, ocean acidification, and extreme weather events. GHGs include carbon dioxide ('CO_2'), methane, nitrous oxide, water vapor, etc. The Earth's average surface temperature has risen by about 1.18 degrees Celsius since the late 19th Century.[1] Though natural systems like volcanoes, permafrost, oceans, etc. also contribute to climate change, research findings show that human activities are responsible for likely contribution of 55% of all GHG emissions.[2]

Contributors To Climate Change

1. Manufacturing

GHG emissions from manufacturing industries primarily originate from burning of fossil fuels in the form of coal, natural gas, oil, etc. Coal is alone responsible for 44% of the world's CO_2 emissions.[3] Some manufacturing processes also involve chemical reactions that release GHGs as by-products or wastes. Energy consumption based on burning of fossil fuel contributes around 73% of worldwide human induced GHG emissions. Manufacturing and construction contribute about 12% of total GHG emissions.[4] Critics say that industrial development should be prioritized above all other goals. But such an attitude has proven disastrous as ecological balance is a precondition to sustainable development.

2. Transportation

Transportation may include public as well as private transportation. Around 12% of global GHG emissions are contributed by transportation alone.[5] Transportation sector is a major consumer of energy, particularly in the form of petroleum. It contributes to emissions of harmful GHGs like CO_2

[1] Climate Change: How Do We Know? NASA (Jun 1, 2021, 11:45AM), https://climate.nasa.gov/evidence/.
[2] YUE Xi-Liu & GAO Qing-Xian, Contributions of natural systems and human activity to greenhouse gas émissions, Science Direct (2018).
[3] Christina Nunez, Fossil Fuels, Explained, National Geographic (Jun 1, 2021, 12:10PM), https://www.nationalgeographic.com/environment/article/fossil-fuels.
[4] Mengpin Ge & Johannes Friedrich, 4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors, World Resources Institute (Jun 1, 2021, 12:01PM), https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors.
[5] ibid.

and Nitrous oxide. It also causes air pollution by releasing toxic gases like Sulphur oxides and particulates. Road transportation is the major contributor within transportation. Today, every individual either owns or aspires to own a private vehicle. Public transportation systems like metros, buses, etc. are less polluting and gaining popularity but only gradually. Air and marine transportation are other modes within transportation that contribute toes GHG emissions.

3. Food Production

World population is expected to increase to 9.7 billion in 2050.[6] To sustain this huge population, food can either be grown through the processes of agriculture or animal husbandry. Global food system is responsible for approximately 21-37% of annual GHG emissions.[7] Industrialized farming practices are responsible for soil erosion and soil pollution due to use of chemical fertilizers and pesticides. This adds nitrous oxide, a powerful GHG to the atmosphere. Conversion of forests into farmlands and ranches cause deforestation. Ruminant animals like cow and sheep emit methane as they digest plants. Feeding huge quantities of grain and water to farmed animals requires deforested land and resources and is extremely energy-intensive. A contrarian view is that organically grown food too contribute to environmental degradation and are unaffordable for masses. Though the argument has substance, with scientific progress, organically grown food shall become affordable and accessible to the masses. GHG emissions of organic produce is much lesser than chemically grown food.

Policy Interventions

1. Technological Policy Interventions

Carbon capture, sequestration and storage technologies need to be harnessed at global scale to suck carbon from atmosphere and store it underground or recycle it sustainably. Electric and hybrid vehicles which run on clean fuel should be promoted. Switch to renewable sources of energy for human and industrial consumption by wide scale use of solar, wind and tide energy at affordable cost is the requirement. Plant based meat alternatives, as championed by the likes of Impossible Foods, can reduce food based GHG emissions. Ministry of Science & Technology in consultation with NITI Aayog should formulate policies conducive for such technological adoptions. Major scientific bodies like CSIR, universities, and IITs shall foster research and incubate disruptive ideas with lucrative financial support to researchers. Ministry of Road Transport and Highway should in

[6] Growing at a slower pace, world population is expected to reach 9.7 billion in 2050 and could peak at nearly 11 billion around 2100, United Nations (Jun 1, 2021, 10:10AM), https://www.un.org/development/desa/en/news/population/world-population-prospects-2019.html.

[7] John Lynch, Michelle Cain, David Frame & Raymond Pierrehumbert, Agriculture's Contribution to Climate Change and Role in Mitigation Is Distinct From Predominantly Fossil CO_2 Emitting Sectors, Frontiers (May 31, 2021, 10:10PM), https://www.frontiersin.org/articles/10.3389/fsufs.2020.518039/full.

partnership with the private sector, particularly the auto sector, lay down a roadmap to promote manufacturing and adoption of electric vehicles. Incentivizing consumers to buy electric vehicles with subsidies and financial support could make a difference. Awareness among general public about harmful effects of fossil fuel burning and the impact of climate change is of utmost importance. A policy for roof-top solar energy generation with direct bank transfers to consumers for surplus electricity generated can popularize the idea among Indians. Carbon credit system and policies on trading of surplus carbon credits on exchanges should be designed with participation of industry leaders. Critics argue that technology is not the panacea for all ills. They bat for fundamental changes in economic system and lifestyle. Such a utopian worldview is counterproductive in a world where more than 9% live in extreme poverty with less than $1.9 a day of income.[8] A scientific approach is better than a radical knee-jerk response to climate change.

2. Natural Policy Interventions

Deforestation should be immediately curbed. Degraded forests need to be rejuvenated. Afforestation needs to be promoted on a mission scale. Trees and plants are sites of natural carbon capture and storage. Education curriculum, right from primary school level, should incorporate lessons on climate change, its impact and role of forests and trees in curtailing it. Vegan food as an alternative to meat needs promotion. Soil erosion and soil pollution need to be checked. Land use planning and management needs more focus. Industries and Tourism must respect nature and stay away from protected forests. Population control and family planning need more attention through education and awareness. Ministry of Environment, forests and climate change should along with major agricultural and research institutions, formulate appropriate policies to protect our forests and increase forest cover. Active involvement of people, especially the forest dwelling communities and hill tribes is imperative. Industries can fund afforestation drives by harnessing their Corporate Social Responsibilities funds. A contrary view relies disproportionately on technological remediation. While technology can reverse some of the impacts of climate change, we cannot completely rely on it. At present all such technologies are at a nascent stage and are mostly uneconomical. We need a holistic policy that taps all possible resources and solutions to deal with climate change.

[8] COVID-19 to Add as Many as 150 Million Extreme Poor by 2021, World Bank (Jun 1, 2021, 3:12PM), https://www.worldbank.org/en/news/press-release/2020/10/07/covid-19-to-add-as-many-as-150-million-extreme-poor-by-2021.

Conclusion

An IPCC 5th Assessment report on global warming projects Earth's surface temperature to rise further by as much as 5 degrees Celsius by 2100 in 21st century, in extreme scenario.[9] We need to wake up and acknowledge the threat posed by climate change. Right policies, timely implementation through technological interventions and community participation is the way forward.

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