



Environmental Concerns and Climate Change Education in School rooms of India

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Abstract

Climate Change and Environmental concerns, today produce devastating effect globally including South Asian countries like India. Heat Waves, droughts, floods, cloud bursts, unwanted calamities observed is unnatural due to continuous depositing of poisonous substances on Earth's surface. The UNICEF report (2007) elaborated the most adverse effects of climate change in four developing regions: Asia, Africa, Latin America, small island nations because of Global Warming (United Nations, IPCC 2023). The immediate response to Climate Change and Global Warming is Climate Change Education, Technological Transfer which is a game changer. Hence Climate change Education should be included as one of the compulsory curricula, subject both at central level boards such as CBSE, ICSE, 8 union territories, 28 state boards levels. The study aimed to acknowledge and throw insights to improve the curriculum for "Climate Change Education (CCE) in India" as one of the compulsory subjects for more than 40% of the Indian population, under the age of 25, and hence School-based education plays a significant role. India is standing at a critical juncture where environmental action is not just necessary, but urgent needed to tackle the ongoing impacts of climate change. India, with the various technologies—including no-tech, low-tech, and high-tech solutions—are used for educating children in remote areas, particularly among marginalized sections of society. Hence, Climate change Education in India is just not a luxury but a necessity that empowers every child to safeguard their future of having proper knowledge related to Climate Change with various Technological Transfer to mitigate the solution.

Keywords: Climate Change Education, Technological Transfer, Global Warming, school-based curriculum, India, Green House Affect. Heat Waves, Floods, Droughts.

I. Introduction

The United Nations, IPCC (2023) referred climate change as long-term changes in temperature and weather conditions where more than a century of burning fuels as well as unequal and unstainable energy and land use have led to global warming of 1.1 degrees Celsius above pre-industrial levels. Climate change broadly refers to variations in wind patterns, average rainfall, and the amount of sunshine received, all of which affect the Earth's climate. History showed that the Earth's temperature has never been constant; it has fluctuated over time, marked by significant changes in weather conditions such as the glaciations of the Ice Ages and the peak glaciation periods, as well as intervals of extreme heat and cold, shifts in sea levels, and changes in atmospheric conditions. Today's climate changes are not solely due to the atmospheric conditions. Earth has experienced in the past but are primarily linked to the phenomenon of global warming. Advances in human technology have significantly impacted natural climate processes, leading to issues like global warming, the greenhouse effect, and other challenges to human evolution. One major factor contributing to these changes is the rapid burning of fossil fuels, which releases harmful gases Carbon dioxide into the Earth's atmosphere and contributes to the greenhouse effect. According to the World Meteorological Organization (WMO, 2025), Green house levels surged to a new record, committing the planet to rising temperatures for many years to come . The greenhouse effect is a natural process in which certain gases in the atmosphere, such as water vapor, carbon dioxide, methane, nitrous oxide, and ozone, trap heat, thereby warming the Earth's surface. Current examples of human activity that contribute to these climate changes include the burning of fossil fuels and the greenhouse effect, which are primary drivers of global warming. The climate changes we are witnessing today are considered serious and raise significant concerns for future generations. It is estimated that this will eventually increase the Earth's



surface temperature by 1.2°C due to various toxic agents deposited on the United Nations, IPCC (2023).

International Climate Change Organizations and Their Role in Addressing

The United Nations, IPCC (2023) reports elaborated on the most adverse effects of climate change in four developing regions: Asia, Africa, Latin America, and small island nations. The IPCC (Intergovernmental Panel on Climate Change) emphasized that toxic gases emitted from fossil fuels could raise global temperatures by 3 degrees Celsius, with a potential increase of 1 to 1.2 degrees Celsius above the current Earth's surface temperature. This phenomenon is referred to as global warming.

The IPCC (Intergovernmental Panel on Climate Change, 2023) also predicted increased rainfall and heat waves, rising sea levels, and reduced crop production due to droughts, floods, and cloud bursts, which ultimately contribute to the "greenhouse effect" surrounding the Earth. IPCC also predicted that these drastic effects would significantly increase the risk of hunger, spread climate-sensitive diseases such as malaria, and potentially lead to the extinction of 20-30 percent of the flora and fauna.

UNICEF highlighted that by 2030, developing countries will face these disasters with greater intensity due to a lack of technology transfer. As part of the SAARC (South Asian Association for Regional Cooperation), India recognizes that climate change and global warming continue to be some of the most pressing challenges to address. In light of global warming and climate change, UNICEF (2023) reported that 96% of children will be exposed to air pollution, 49% will face water crises, 62% will be in areas with high pesticide levels, and 57% will encounter heatwaves. Additionally, 9% of children have been found to have high levels of lead in their blood.

Hypotheses of the Study

Environmental concerns arising from climate change are among the most pressing challenges faced by people around the world, particularly in South Asian countries like India. As India grapples with rising sea levels, desertification, and extreme weather events, it is crucial to implement Climate Change Education. Given that over 40% of the Indian population is under the age of 25. In fact there are many Indians in this age group that roughly counts one in every five globally, who are in the age of 25 live in India (Laura Silver, Christine Haung and Laura Clancy, 2023). educating this demographic is essential for fostering a resilient future. School-based

education plays a significant role in shaping habits, and installing environmental awareness at an early age can promote eco-friendly behavior towards nature. As India moves towards a greener economy, students equipped with environmental knowledge will have access to new employment opportunities. However, the average understanding of climate change and its devastating effects remains very limited among the Indian population. Therefore, prioritizing this subject in schools and colleges is imperative. Climate Change Education is an interdisciplinary subject that intersects with STEM (Science, Technology, Engineering, and Mathematics). These combinations of subjects prove helpful in identifying the concerns of the environment and their inter-disciplinary ways to handle the same. (Aditi, 2024), yet it lacks proper guidance at the school level. Among the few, in Bihar, digital tools are used as 'Safe Saturday' Programs ; Digital Managemnet in Kerala are part of Kerala with digital contents reaching remote areas and Gujarats's self paced school safety has been adopted by ten of thousands of schools (Sadhna Pandey for UNICEF India, 2025). This subject requires immediate attention and prioritization, especially as India confronts the destructive impacts of climate change. To address this urgent issue, young minds, scholars, and researchers must be encouraged to explore new areas of climate change mitigation. This initiative is a vital component of technology transfer and is necessary to address the practical challenges posed by the topic.

II. Aims and Objectives

The study aims to acknowledge and throw insights to improve the curriculum for "Climate Change Education (CCE) in India" at both state and national levels by advocating for its inclusion as a distinct course in CBSE, ICSE, and various state boards. This initiative is intended to enhance the understanding of climate change among students, researchers, and educators. By recognizing the importance of this topic and leveraging technology transfer in India, the study seeks to significantly improve the effectiveness of climate change education in the country.

Objectives

- The study aims to elucidate the concepts of climate change and its detrimental effects on the environment and society.
- It will examine the implications of climate change education within the context of India.
- The discussion will also address the roles of international organizations dedicated to climate



change and their contributions to the global response to this pressing issue.

- Finally, the paper will present observations, discussions, and a summary conclusion that emphasize the need for climate change education as a distinct subject at both state and central levels, despite its often being considered a topic within the broader framework of STEM studies.

III. Methodology of the Study

Observation

1. The National Education Policy (NEP, 2020) focused primarily on the practical aspects of the subject of climate change, promoting hands-on experimental learning while giving less emphasis to theoretical subjects. It advocated for project-based learning in this field.

2. UNICEF, India (2023), in collaboration with the Government of India, is currently developing a curriculum for Climate Change Education in India, but has not been accepted Nationwide, till now but in the pipelines to come. This initiative includes various teacher training programs, as well as digital training for teachers, providing them with teaching materials to guide their instruction on the subject.

3. The Ministry of Environment and Climate Change MoECC, (2025) engages school-going children in activities such as tree plantation and waste management, which emphasize the practical and experimental components of their studies.

4. Climate Change Education (CCE) is integrated into subjects like Environmental Science, Geography, and General Science, but it is not treated as a separate subject or course.

5. In Bihar, digital tools are recognized under the "Technology-Based Safe Saturday Program." This program is conducted every Saturday to motivate children to address environmental crises while aligning them with their academic studies. It reaches approximately 8.4 million children across the state. In Kerala, a curriculum equipped with various digital tools is available to students, effectively reaching remote areas and marginalized communities. In Gujarat, Climate Change Education (CCE) and environmental concerns are already part of the curriculum in thousands of schools. (UNICEF India 2023).

6. Lifty Thomas (2024) discussed "Climate Change in the Classroom," explaining that Indian schools are in the process of shaping the next generation of eco-friendly leaders who can work towards the betterment of society. He emphasized that several key elements must be incorporated into their studies to achieve this goal which are as follows:

****Importance of Climate Change Education and Environmental Concerns**

****Why Climate Change Education is Important in India**

**** As Climate Change Education is essential in India due to the country's vulnerability to the impacts of climate change, such as extreme weather events, rising sea levels, and changing agricultural patterns. Educating the youth about these issues fosters awareness and empowers future generations to take action.**

****Government Initiatives Supporting Climate Change Education in India**

****The Indian government has initiated various programs and policies to support climate change education. These initiatives aim to integrate climate education into the curriculum and promote sustainable practices in schools.**

7. Innovative Approaches observed in the Classroom Regarding Climate Change Education and Environmental Concerns involves:

*****Project-Based Learning:** Students engage in hands-on activities, such as energy audits at their schools, composting waste, and creating awareness campaigns on environmental issues.

*****Green Infrastructure:** Some schools are investing in green infrastructure by installing solar panels and implementing rainwater harvesting systems.

*****Digital Tools:** Platforms like Diksha and Swayam are utilized to promote online courses on climate change education in local languages, making them accessible to a wider audience.

8. *****Role of Teachers and Educators in Climate Change Education:**

Teachers and educators play a crucial role in climate change education. They participate in capacity-building workshops focused on climate literacy and sustainable development. While there is no separate curriculum specifically for climate change, educators are provided with toolkits that include curated lesson plans, documentation, games, and hands-on activities.

9. The Challenges observed to Address in Developing a Climate Change Education Curriculum in India are as follows:

*****There are several challenges in creating an effective climate change education curriculum in India, including the need for standardized content, resource availability, and training for teachers.**

*****Innovative Approaches Observed in Classrooms Across States and Central Boards**

*****School-to-Village Projects:** Students are encouraged to engage with local communities by educating villagers about water conservation and



renewable energy, thereby creating a ripple effect of awareness and action.

***Through these innovative methods, climate change education is becoming more integrated into the learning experiences of students across India, promoting environmental stewardship for future generations.

IV. Discussion

India is at a critical juncture where environmental action is not just necessary, but urgently needed to tackle the ongoing impacts of climate change. The effects of climate change, including global warming, are being felt throughout the country, with events such as floods, droughts, and cloudbursts regularly affecting communities, especially in Himachal Pradesh, Uttarakhand, and Northeast India. As a developing nation of South Asia, India must find effective ways to combat these destructive effects of Climate Change with the help of Technology Transfer. With more than 250 million students in India, India has a vast educational system and enormous talented brains at younger age (Laura Silver, Christine Haung and Laura Clancy, 2023).. By integrating environmental concerns and climate change education into the curriculum, we can spark a nationwide movement to address these issues. Education should be viewed not just as a curriculum but as a mean to foster a mindset for sustainability and responsibility towards building a greener environment. In spite of the ongoing threats posed by climate change, the general population has a relatively low response towards it, primarily due to limited awareness. This can be improved by introducing a nationwide curriculum focused on Environmental Concerns and Climate Change Education. Such education can empower policymakers, stakeholders, researchers, and professionals to tackle societal and global challenges regarding Climate Change. A comprehensive, school-based curriculum is essential to highlight the connections between these challenges and government initiatives. Ultimately, this approach can lead to innovative programs in education and technology. India is facing a dual challenge regarding climate change education. Firstly, it is working towards its own goals to address this issue, and secondly, as a member of the South Asian Association for Regional Cooperation (SAARC), it is committed to the Sustainable Development Goals (SDGs), (according to which urgent Action to Combat Climate Change and its Impact is needed as per the SDG 13th Goal of the Organization. (UN DESA, 2024).

In India, it has been observed that various technologies—including no-tech, low-tech, and high-tech solutions—are used for educating children in remote areas, particularly among privileged sections of society. This approach can be leveraged to introduce a new curriculum focused on climate change education and technology transfer. Such a curriculum could incorporate resources like laptops, radios, tablets, smartphones, and community-led initiatives featuring supportive videos and interactive sessions. Teachers would be equipped with lesson plans and educational toolkits. To ensure effective implementation, teachers and educators need proper training on digital tools and the subject matter. Many schools are already burdened with an overloaded syllabus, so policymakers and educators must carefully determine which programs are essential. Climate change education and technology transfer should be prioritized in the curriculum to address this critical issue effectively in India.

V. Summary and Conclusion

Climate Change and Environmental concerns observed today produce a devastating effect globally including South Asian countries like India. Heat Waves, droughts, floods, cloud bursts and unwanted calamities observed is unnatural but because of constant misuse of natural resources and continues depositing of poisonous substances on the Earth's surface. The immediate ongoing process to response to climate change is Climate Change Education and Technological Transfer such as Mitigation, which can be a game changer. Hence Climate change Education is just not a knowledge but a mindset of sustainability towards having a reliable future for the coming generation to come where it should be observed that Climate change Education should be a part of the compulsory curriculum both at central level boards such as CBSE, ICSE and 8 union territories and also including the 28 state boards. If the schools are overburdened with their routine syllabus, the stakeholders and policy makers should cross-check the important curriculum to retain in the said class along with Climate Change Education and Technology Transfer as one of the important subjects. The knowledge of Climate change and technological Transfer should also be a part of the curriculum in remote areas where the children can access the knowledge with the help of online programs as observed in some of the states such as Bihar, Kerala and Gujarat. Thus, one can sum up by saying that the term Climate change Education is not just a luxury but a necessity that empowers every child to safeguard their future of having proper knowledge related to Climate Change and its



education along with various Technological Transfer to mitigate the solution.

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