

## CLIMATE CHANGE – INTEGRATING POLICY, PRACTICE AND EDUCATION

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**Abstract:** *Growing up in the age of rapid climate change is the biggest health threat that the humanity is facing today. The Earth's climate is getting altered fast by the increased emissions of heat-trapping greenhouse gases. IPCC (Intergovernmental Panel on Climate Change) report on Climate Vulnerability Index (CVI) has clearly indicated that India's geographic and socio-economic susceptibilities are the highest among all other nations. The mapping of all sensitive areas, industries and population concentrations at a local level can help to take appropriate action in order to adapt to conditions posed by climatic crisis which will help to strengthen resilience in future. Higher Education Institutions (HEI) can play a major role in bringing a paradigm shift of how and how much we teach about climate change related issues and their mitigation measures. India's National Education Policy 2020 aims at imparting a holistic and multidisciplinary education with flexible and innovative curricula. To bridge the gaps through education and awareness, this study analyses the nuances of current education system and puts forward a framework for understanding the methods to mitigate the impacts of climate change by integrating 'National Goals' into 'Education Policy of HEI' through a multi-disciplinary approach that considers the new technology and traditional knowledge.*

**Key words:** Climate Change, Emissions, Health, Policy

## Introduction

Climate change is the key issue of contemporary times and we are at a critical standpoint. Earth has a greenhouse effect in the absence of which the global temperature would be below the freezing point of water. However, the existing trends in emissions and atmospheric greenhouse gases, if not addressed in time, would give rise to an alarming situation of extreme catastrophic events likely to occur by 2040. The principal energy sources of our present industrial establishments are fossil fuels, when burnt they release CO<sub>2</sub> into the atmosphere. In the burning of fossil fuels, sulphuric acid is also getting added to the atmosphere. Like Venus, our stratosphere now has a substantial mist of tiny sulphuric acid droplets which suggest that our major cities are polluted with noxious molecules (Sagan, 1985). From shifting weather patterns that threatened food production to rising sea levels that increase the risk of calamitous flooding, the impacts of climate change are global in scope and unprecedented in scale (Adedeji, 2014). Health professionals worldwide are responding to the harms caused by this unfolding crisis. According to the 2015 **Paris Agreement** (COP21), to avert catastrophic health impacts and prevent millions of climate change related deaths, the world must reduce the greenhouse emissions to limit temperature rise under 1.5°C. Major alterations of landscape due to man-made and natural processes has transmuted the existing landscape and climate of Earth but intelligent life can help reversing the serious effects of environmental changes by adopting strategies to mitigate the same. While mitigation goals target the root causes of climate change, adaptation goals target its effects. This is done by making changes to natural or human systems in response to observed or anticipated climate stimuli.

India's geographical location makes it one of the most vulnerable nations which has experienced extreme climatic events like droughts, floods, cyclones with erratic rainfall pattern in the past two decades. Hence, it becomes even more important now to talk about changing weather patterns leading to food insecurity, increased health problems and heat-related deaths and act on how businesses need to change through professional education by considering the changing climate events. To find answers to these existential questions, we have conducted an analytical study to understand the potential areas in policy, practice and education to explore the possibilities of aligning the climate related education in higher education institutes to India's Intended Nationally Determined Contribution (INDC) towards climate justice.

## CLIMATE CHANGE: A GLOBAL CONCERN

### The Climate Conventions through History

It has taken 50 years from Stockholm to COP 27 for environmental concerns to gain prominence on the global agenda for climate change to progress within this framework (Figure 01).

**Stockholm Conference 1972**, the first United Nations Conference on Human Environment (UNCHE) with motto '**Only One Earth**' for entire humanity, placed the environment at the forefront and marked the start of a dialogue between industrialized and developing countries on the link between economic growth, pollution of air, water, and oceans and the well-being of people around the world (UNCHE, 1972). Eight years later in 1980, World Climate Research Programme (WCRP) was established under the joint sponsorship of the International Science Council (ISC) and the World Meteorological Organization (WMO) with an aim to monitor, simulate and project global climate with unprecedented accuracy, and provide climate information for use in governance, decision-making and in support of a wide range of practical end-user applications. Further in the year 1988, with a mandate to assess information related to climate change, the Intergovernmental Panel on Climate Change (IPCC) was jointly established by the World Meteorological Organization (WMO) and the United Nations

Environment Programme (UNEP). Organization’s major responsibilities were to prepare assessment reports to evaluate the environmental and socio-economic consequences of climate change and to formulate realistic response strategies.

**The Earth Summit 1992**, titled ‘**Our Common Future**’, held at Rio de Janeiro also known as UN Conference on Environment and Development (UNCED) adopted **Rio Declaration** and **Agenda 21** and concluded that all people worldwide should pursue the idea of sustainable development on a local, regional, national and international scale. To meet our demands and protect human life, it also recognized the need of integrating and balancing economic, social, and environmental factors. This concept which was revolutionary at the time, sparked a contentious debate about how to ensure sustainability for development both inside governments and between governments & their constituents (UNCED, 1992).

**The Kyoto Protocol in 1997** (popularly known as UNFCCC), commits developed nations and emerging markets to reduce their greenhouse gas (GHG) emissions in line with pre-determined individual objectives (Kyoto Protocol, 1997). This agreement has given rise to and unsaid conflict between developed and developing economies where rich countries were unwilling to compromise on their lifestyles and poor countries were unwilling to limit their cap on basic development (Narain, 2009). After 18 years, Paris Agreement in 2015 proposed a cycle of global climate action lasting five years that steadily increases in scope where each nation must submit an updated Nationally Determined Contribution (NDC), also known as a national climate action plan, every five years. The Agreement established long-term objectives to serve as a roadmap for all countries as they work to combat climate change by lowering greenhouse gas emissions (GHG) to keep the increase in global temperature to 1.5 degrees. It also suggests that countries shall evaluate their agreement commitments every five years, and they may be eligible for funding to assist them in achieving these objectives of mitigating climate change, strengthen resilience and enhance abilities to adapt to climate impacts.

**Figure 01: Last 50 years as Major Sign Posts on Global Climate Change**



Source: Author

### Climate Change – Action Plans and Policies

The growth and development of any country can be associated with the health and well-being of its young population. At the same time, this is the population which is most affected and prone

to the harmful effects of environmental degradation. As per Climate Change and Environmental Sustainability report by UNICEF, climate change immediately jeopardizes a child's ability to endure, grow, and prosper. While being the group least responsible for the environment's alteration, roughly 90 percent children under the age of five endure the burden of illness related to climate change. Each year, air pollution-related causes claim the natural lives of more than 500,000 children under the age of five. Even more, will suffer irreparable damage to their developing lungs and brains. Due to climate change and environmental deterioration, the present generation of youngsters will experience living in a world that is significantly more hazardous and uncertain. The United Nations Climate Action Plan defines the Net Zero coalition as “cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance” (UN DESA, 2021). SDG - 13 aims to combat climate change and its impacts by taking urgent action. Climate change and environmental degradation are equity issues that undermine the rights of every child, especially the most disadvantaged. The realization of children's rights as embedded throughout the SDGs is contingent on taking action to address and adapt to Climate change (United Nation Sustainable Development Goals, 2015). As an urgent response to combat Climate Change and its impacts, the Sustainable Development Goals (SDG) – 13 focuses on:

- Strengthening resilience and adaptive capacity to climate-related disaster
- Integrating climate change measures into policies and planning
- Building knowledge and capacity to meet climate change
- Implementing the UN Framework Convention on Climate Change

The recent 27<sup>th</sup> Conference of Parties held in Egypt in 2022 welcomed the below mentioned strategies to mitigate climate change and bridging the gaps:

- Loss and Damage Funding
- Attention on structural reform of the financial system
- Innovative mechanisms that support nature and climate outcomes at National and Ecosystem levels
- Climate Resilient Diets
- Climate Response for Sustaining Peace
- Reversing Forest Loss

Supported by G7, 'Global Shield' aims to rapidly provide insurance and disaster protection funding in the event of floods, drought and other climate calamities in climate-vulnerable nations. This is being developed in collaboration with the Vulnerable Twenty (V20) group of 58 climate vulnerable economies (COP 27, 2022). At the UN Climate Change Conference in Glasgow (COP 26), the Honourable Prime Minister of India asserted that the nation is meeting all its Climate Change commitments under the Paris Agreement. It has been highlighted that India, which accounts for 17 percent of the global population, is responsible for only about 5 percent of total emissions. As a proposed strategy to mitigate climate change, a five-point agenda or the five '*amrit tattva*' were proposed which focused on the adoption of a sustainable lifestyle, the importance of climate finance, and technology transfer while committing towards achieving net zero energy by the year 2070 as part of Nationally Determined Contributions (NDC) pledge to meet 50 percent of its energy needs from renewable sources by 2030 (COP 26, 2021). India's National Action Plan on Climate Change (NAPCC) 2008, identifies a range of priority areas for coordinated intervention at the National and State levels. NAPCC focuses on inclusive and sustainable development programs into action through connections with civic society, local government institutions and public-private partnerships. While taking climate change into account, the poor and vulnerable elements of society are protected. Achieving National growth goals through an improvement in ecological sustainability results in greater reductions in greenhouse gas emissions, developing management solutions that are

efficient and affordable. Use of appropriate technologies for both adaptation and mitigation of greenhouse gases emissions, engineering new and innovative forms of market mechanisms for sustainable development and implementation of programmes through public-private partnership are the main highlights of the plan.

### Finance Related to Climate Change

For those who live in developed nations, the effects of climate change entail building taller bridges and spending more for a bowl of meal. Other factors include greater temperatures, catastrophic flooding and longer droughts. However, climate change is another roadblock in the way of growth and development for individuals living in low-income nations. The type of climate change anticipated for a nation determines ‘exposure.’ Although there is broad consensus that anthropogenic climate change will result in greater average global surface temperatures and precipitation over the coming decades, global models have less agreement on changes for nations or areas. As a result, there is a great deal of ambiguity in how much a country is exposed to climate change. Change in the global economy, such as the pace of population and economic development and the advent of new technologies are hard to anticipate with any degree of accuracy. Variation in policy assumptions, demographic and economic patterns result in different quantities of greenhouse gases (GHG) in the future. Even if GHGs are anticipated with accuracy, there are still discrepancies in how climate models represent the link between the planet and the atmosphere. This causes a wide range of climate change forecasts for the entire world as well as for certain nations and areas. Evidence shows that climate science and economics account for almost equal amounts of the uncertainty around climate change (Arndt, 2012).

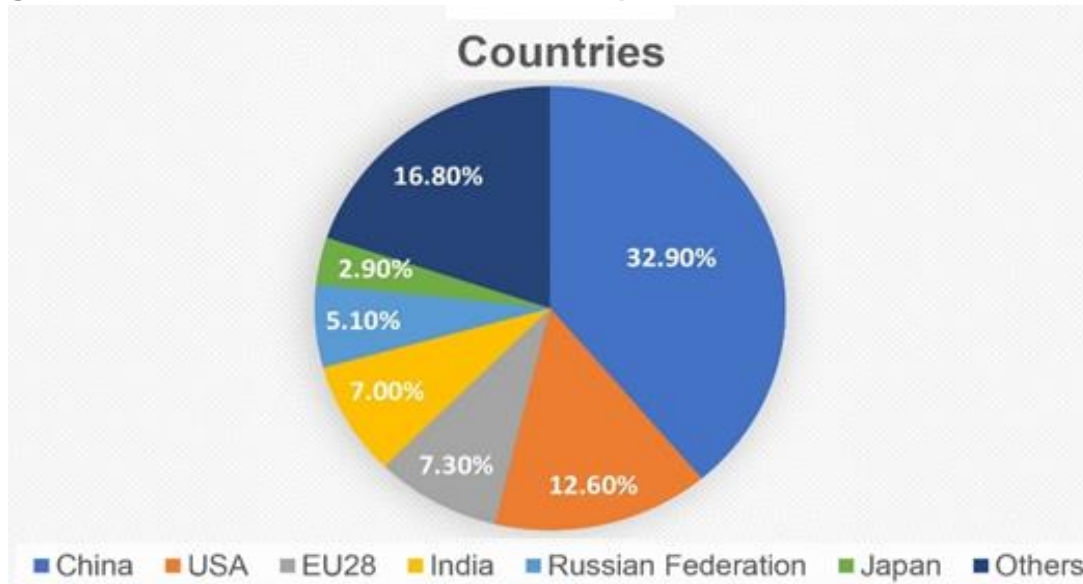
The above facts lead to conclusion that local/national communities are contributing disproportionately to greenhouse gas emissions, people living in rich neighbourhoods and high-income nations may have a bigger responsibility in terms of mitigation. In contrast, individuals in low-income regions and nations may need to put out more effort in terms of adaptation because their populations are more likely to be disproportionately affected by the negative effects of climate change and have fewer resources available. Table 01 shows the carbon emissions of the whole world (Figure 02). Despite this, the demands of economic expansion at any costs are equally significant in low-income nations, and the effects of climate change will be felt worldwide, necessitating both ‘adaptation’ and ‘mitigation’ in all situations. India expressed its needs in the COP27 as an estimated figure of \$1 trillion to be invested over next ten years to \$10 trillion needed to achieve net-zero by 2070. However, it was pointed out in the conference that the yearly \$100 billion promise by the developed nations to developing nations was not being delivered and the target was missed. Experts expect that the efforts shall be finally realised by 2023 to help achieving the said target.

**Table 01: Global Carbon Emissions, 2021**

Country	Share in Global Emissions 2021 (in %)	Country	Share in Global Emissions 2021 (in %)
China	32.9	Saudi Arabia	1.5
United States	12.6	Canada	1.5
EU27	7.3	Brazil	1.3
India	7.0	South Africa	1.2
Russia	5.1	Turkey	1.2
Japan	2.9	Mexico	1.1
Iran	1.9	Australia	1.0
South Korea	1.7	International Aviation	1.0
Indonesia	1.6	International Shipping	1.8

Source: JRC Science for Policy Report, 2022

**Figure 02: Global Carbon Emissions – Developed Countries as main Contributors**



Source: Prepared by Author

### **Climate-Gender Association and Decision-Making Role of Women**

“Climate impacts, especially extreme weather events, are affecting the roles of women and men around the world, particularly in rural areas” (Fleur Newman, UN Climate Change). Gender-based violence is prevalent in areas of conflict that are also more at risk of experiencing catastrophic weather events. For example, women and girls in Colombia, Mali and Yemen are particularly at risk of experiencing gender-based violence owing to the combination of climate change impacts, environmental degradation and conflict (Bonn, 2022). The available sources in this domain have put forth the emerging issues as a by-product of climate related concerns as many communities have looked to child marriage, which is considered a form of gender-based violence, as a means of surviving a disaster. For instance, child marriage is a way for people in Bangladesh, Ethiopia, and Kenya to secure money or assets and make up for losses caused by climatically related disasters like drought, frequent flooding and more intense storms. The ability of women and girls to carry out daily tasks is disproportionately impacted by extreme weather events brought on by climate change, which is a key factor in dropping out of school among young girls. Due to the negative effects of climate change, it is now necessary for women and girls in certain countries to go farther from their houses in order to collect firewood and water for their family. These chores have historically been carried out by women and girls. Their exposure to gender-based violence outside the house is thus increased by the lengthier travels (UN Women, 2022).

The above statements lead to conclusion that being gender-responsive when creating climate policy is essential because responding to climate change can provide women the opportunity to access more resources and participate in decision-making owing to altering gender norms. It has also been demonstrated that inclusive governance, supported by international organisations and national governments, can produce durable and useful climate-resilient policies that enhance social equity generally and gender equality specifically by involving more women and marginalised groups in decision-making.

### **Bridging Gaps Through Education – Nurturing Environmental Consciousness**

The inclusion of environmental education and awareness among students from a young age helps them make better choices in their everyday life and encourages students to conserve the environment. Globally, the field of Architecture is charged with conceiving the built environment that should adapt to the natural biodiversity through environmentally friendly plans. The global



education development agenda reflected in Goal 4 (SDG4) seeks to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” by 2030 and was adopted by India in 2015. Internationally, various researchers have been engaged in analysing the actions and impacts of universities on sustainability and climate change. In order to study these impacts, McCowan’s (2020) framework conceptualized the universities as having five principal modalities: education, knowledge production, service delivery, public debate and institutional operations and found that the ‘bridging actors’ are central in disseminating the information to society as well as feedback from environment to university. The course curricula of Higher Education Institutes can be redesigned to accommodate the rising needs of environmental studies related to climate change to cater to all ages and socio-professional groups in the population (Figure 03). Creating awareness, imparting knowledge, having a right attitude, skill development, evaluation ability and participation towards resolution of environmental problems should be the main objectives of any educational institute. Institutes should start building programs to motivate students for active participation in environmental improvement and protection by acting individually and collectively to solve various environmental problems.

Institutions of higher education generally have an environment that can facilitate a multidisciplinary approach – by incorporation of new technology with Traditional Local Knowledge (TLK) – Artificial intelligence and satellite-based imagery can be used in many ways in architecture and planning fields. 1) GIS mapping for watershed and biodiversity studies can be integrated with local knowledge of geology and traditional water systems in order to find improved solutions to the climate generated issues, 2) Geotagging in agriculture can be widely used as a tool for asset management that will enable farmers to create more efficient and effective farming techniques and monitor crop fields, 3) Machine learning a subset of AI, facilitates the analysis of large data sets is very useful tool in research and the outcomes can help predict patterns which can then be used in decision-making for environmental issues.

**Figure 03: The Role of Universities on Climate Related Awareness**



Source: Prepared by Author

The National Education Policy of India was reconfigured in 2020 with a vision to transform India sustainably into an equitable and vibrant society by providing high-quality

education to all through the development of a conscious awareness of one's roles and responsibilities in a changing world by academic institutions. National Education Policy aims at Imparting holistic and multidisciplinary education with flexible and innovative curricula focusing on community engagement and services, Environmental Education, Value based education and catalysing Quality Academic Research through the National Research Foundation to become leaders in the realm of climate change.

## Conclusion

Quoting Nelson Mandela "Education is the most powerful weapon which you can use to change the world." Undoubtedly, education plays a significant role in encouraging a sustainable mindset, which will accelerate the achievement of the SDGs. Aligning National Education Policy with climate agenda of the country can aid to mitigate the effects of climate change and meeting the NDC goals of each country. A comprehensive strategy that addresses the fundamental obstacles to a zero-carbon, climate-resilient future will be possible with a deeper and more thorough knowledge of the effective links between Education, Policy, Profession, NDCs and SDGs. This analysis shows that the key question is no longer whether the sustainable development and climate change agendas can coexist. Instead, to maximise any potential outcomes, countries will need additional assistance to accomplish these objectives in a way that promotes coherence, encourages collaboration, and maximises outcomes. Even though there is still work left to be done and lessons to be learnt from early implementation, the research undertaken for this study reveals that the alignment of education system with climate agenda has a very good possibility of working jointly.

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