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Necessity and Challenges in Lawful Implementation of Sustainability in Our Infrastructural Development

Dr. Mohammad Harun Chippa*

***Assistant Professor, Dr. Anushka Vidhi Mahavidyalaya, Udaipur (Raj.) INDIA**

Abstract: Infrastructure consists of basic systems and facilities, which include transportation, buildings, communication systems, water supply, power supply, etc. Infrastructure development is essential to facilitate a country's economic development and reduce poverty. However in present era, the earth is in dire need of a plan to combat climate change as well as secure our resources for present and the future generation. The solution for the same is sustainable development. Sustainable Development aims to bring a balance between meeting the requirements of what the present demands while not overlooking the needs of future generations. It acknowledges nature's requirements along with the human's aim to work towards the development of different aspects of the world. It aims to efficiently utilise resources while also meticulously planning the accomplishment of immediate as well as long-term goals for human beings, the planet as well and future generations. In the present time, the need for Sustainable Development is not only for the survival of mankind but also for its future protection. This paper aims at evaluating the modes which could optimize the growth of sustainable development in India and potential challenges being faced in implementing legal provisions which may facilitate the adoption of green energy in Indian infrastructural development.
Keywords- Infrastructure, sustainable development, green energy, legal provisions, challenges.

Introduction To Sustainable Infrastructure: From the water we drink to the way we travel to work or school, infrastructure touches every aspect of human life. It has the power to shape the natural environment—for good or for ill. As the world's population expands, urbanisation accelerates and emerging middle classes in developing countries demand more services, the need for infrastructure is rising rapidly. Meanwhile, increasingly severe weather events and rising sea levels pose direct threats to infrastructure assets and the critical services these provide, with lack of precise knowledge about future climate change making long-term planning increasingly difficult.

The concept of sustainable infrastructure refers to equipment and systems that are designed to meet the population's essential service needs including roads, bridges, telephone pylons , hydroelectric power stations, etc. based on all-round sustainable principles. This means the infrastructure is environmentally friendly from end to end, and that includes economic, financial, social and institutional factors. With urban areas growing exponentially, especially in emerging countries**,** sustainable infrastructure is showing its worth as a more efficient, productive and environmentally friendly option. Furthermore, according to the World Bank, these facilities prove more profitable as they make for more reliable services and greater resilience to extreme weather events, as well as lessening the impact of natural threats to people and the economy.

In 2015, different countries that are part of the United Nations met at the Sustainable Development Summit and developed the 2030 Agenda containing the 17 Sustainable Development Goals (SDGs). These goals have led most industrialized countries to readjust their strategies to align them with the achievement of the SDGs. Infrastructure projects form an important part of industry and contribute directly to SDG 9 and 11 ; so, sustainable infrastructure development and planning become a necessity.While categorizing a project as a sustainable infrastructure project, it is important to outline the following three dimensions:

1. Commitment to achievement of one or more of the UN SDGs at the project design stage;
2. Assessment and monitoring against clear social, environmental, and economic objectives through a triple bottom-line approach;
3. Consideration of financial sustainability and affordability.

Challenges Associated With Green Infrastructure Legislation: Over the past few decades, efforts and investment have been made to lessen the amount of CO_2 emissions from the infrastructure sector. Yet, in spite of these endeavors, scientific reports show that the current CO_2 emissions generated from the existing infrastructure are still responsible for significant climate change. Most of the existing infrastructure, comprising buildings, water, roads and energy, is not designed to endure changes in

environmental conditions.

In the coming 30–50 years, more climatic changes are expected to occur. We might further experience drastic changes in temperature, rainfall patterns and more frequent extreme events like drought and freezing winters. Hence, we need to act today. We need to plan and decide what necessary steps are to be taken to ensure that our infrastructure is sustainable and resilient enough to meet any unpredictable challenges in the future. Planners, designers and engineers must plan and design sustainable infrastructure that integrates decarbonization as well as being adaptive against various extreme climates. Moreover, most infrastructures will have a considerable lifespan; therefore it will be subjected not only to adverse climate condition at the time of construction but also to unpredictable climate variations in the future. Therefore, in order to enhance the sustainability and resilience of the structures, they should be designed in such a way they can withstand any extreme climate changes.

However, the journey toward sustainable infrastructure is not without its challenges. Legal and regulatory frameworks play a crucial role in shaping the development process, establishing standards, and guiding decision-making. Navigating these frameworks effectively requires a deep understanding of the complex interplay between economic development, environmental protection, social equity, and cultural preservation.

1) Lack of Practical Awareness- One major barrier that exists is the curriculum provided to students. The current curriculum focuses primarily on information like environmental regulations, wildlife conservation, and Supreme Court rulings. These topics, though required, are not the most important. Climate change and its related aspects, which change with each year passing, hold more substance and importance when it comes to environmental education. These topics can only be further enhanced with practical knowledge. Environmental issues that students encounter daily need to be covered in the course syllabus which then, should be related to complicated global environmental issues. Students will then be inspired to come up with answers once they realise how directly connected environmental challenges are to their lives and future. It will cause them to modify how they act, and this should be the ultimate aim of environmental education. Lack of organisational support is also a barrier.

2) Lack of Intent Among Citizens to Follow Environmental Guidelines- According to a report by the United Nations, some areas in the Indo-Gangetic basin in India have already passed the groundwater depletion tipping point and its entire northwestern region is predicted to experience critically low groundwater availability by 2025. Environmental tipping points are critical thresholds in the Earth's systems, beyond which abrupt and often irreversible changes occur, leading to profound and sometimes catastrophic shifts in ecosystems, climate patterns and the overall environment. India is the world's largest user of groundwater, exceeding the use of the United States and China combined. The northwestern region of India serves as the bread basket for the nation's growing 1.4 billion people, with the states of Punjab and Haryana producing 50 per cent of the country's rice supply and 85 per cent of its wheat stocks. However, 78 per cent of wells in Punjab are considered overexploited. Such news is not new to citizens of India. It's been a whole lot of years since we were made aware of the coming disaster. Yet we choose to ignore it and deplete the resources for our personal gains. I firmly stand by my view that we all, maybe including me, are acting nationalists and not actual ones. Govt. has numerous times banned or restricted use of groundwater excavation through regulations but we tend to violate it via bribery or abuse of position or power. Even govt. doesn't comes out with stringent actions upon the violators which gives them the undue courage for such activities.

3) Lack of Powers In Enforcing Authorities-The Ministry of Environment, Forest and Climate Change is the nodal ministry for enforcing the regulatory framework related to the environment, biodiversity, forests, wildlife and climate change in India. It lays down the general policy framework on environmental issues.The Central Pollution Control Board (CPCB) is the central authority that frames the standards and implements the regulations relating to industrial pollution, waste management, emissions or effluent standards, etc. across the country with the assistance of the relevant State Pollution Control Boards (SPCBs) and the Union Territory Pollution Control Committee (UTPCCs).

It is noteworthy that the Boards lack the power to take stringent actions like arresting the violators, seizure of the industry or factory, etc. This in turn encourages the wrongdoers to by-pass the system by paying small fines.Another shortcoming worth mentioning is that Central and State Boards' jurisdiction does not extend to construction sector which is the basis of creating green infrastructure. Enforcement has also suffered because fines for non-compliance have proved to be too low and the procedures concerning punitive action are much too rigid, poorly understood and time consuming. Seldom are the full economic impact and environmental impact of violations taken into consideration due to lack of expert knowledge. Further, there is an acute shortage of competent, knowledgeable and skilled people in the CPCB and SPCBs. This is largely the result of low funding and lack of autonomy of the CPCB and SPCB from the government. SPCBs in some states use contractual employees who have low work motivation, as they are not provided the benefits of a regular government employee.

4) Corruption-We recently witnessed the critical scenes of water shortage in Bengaluru on arrival of summer. Such scenarios are common during summer season in many tier 2 and tier-3 cities. Govt. has fixed certain guidelines for

groundwater extraction like borewell digging upto a certain depth which obviously is not followed in most of the cases. Also, the permits are granted without making any background check or regulation visits as to the requirement of the person applying for. As a result we witness a whole city being endangered for its survival. Another such instance witnessed was cracks developed in the houses of Joshimath town last year which created havoc among the residents. After a thorough research it was found that the prominent reason behind this was abrupt construction in the name of developing tourism. A report submitted by Mishra committee in 1976 resurfaced which stated that the town is situated on the debris of landslides. Hence it was clear that the geographical region required a planned infrastructure. But all the concerns were kept aside for the sake of monetary gains. The incidents show that corruption has taken a high position in our working system. Nobody cares about the future being ruined at the cost of small amount of money.

Suggestions For Effective Implementation Of Laws: The necessity of developing sustainable infrastructure is required not only for combating climate change but also for keeping in mind the future economic growth. For instance, coal and other non-renewable source of energy will not be able to manage the ever increasing need of energy in India. A renewable source like solar or hydro-electric power can easily meet the requirements and will be cost efficient as well. Following are certain suggestions for effective implementation of green laws in realizing the dream of sustainable infrastructure:-

1) Raising Awareness Practically and Not Theoretically– Central and State Pollution Control Boards are responsible for spreading awareness regarding improving environmental conditions but the citizens have to be equally vigilant for the task. Every stakeholder in society has individual obligations to fulfill as well as a duty to provide an equal contribution to society's education. One may always find time for different environmentalists or organisations working on environmental issues to share their insights and contributions. They might also provide funding to educational institutions to set up workshops for instructors and students on environmental awareness. This would be an encouragement for individuals to attend new-age workshops and webinars to be more aware of the environmental concerns of the world. Also the govt. must promote workshops in schools and other educational institutions which should be organized by students themselves which will give them a real time experience of the requirement of green energy.

2) Restricting self-centered approach- The citizens need to understand that their one selfish step is creating a question mark on the future of thousands of other persons. They should develop a habit of making certain changes which could contribute in promoting sustainability in one way or the other. For instance, while constructing a house a person should keep in mind the environmental guidelines in the region. Further, the person setting up any industry should always prefer to build environment friendly structure like preferring natural light instead of artificial one in the premises, installing solar panels, rainwater harvesting, zero wastage of water, etc. We should not wait for the govt. to guide us. Instead this approach should be in our routine habit.

3) Establishing Reginal/Additional Authorities and Granting Additional Powers to he State Boards- As we are aware that the authorities involved in promoting sustainable environment are CPCB, SPCB and NGT. It is suggested that the burden of the authorities should be relaxed by establishing additional authorities for monitoring the various aspects of pollution. The necessity of establishing regional or additional authority is felt not only for the purpose of proper monitoring but also for the purpose of proper implementation of the laws and rules. For instance, under the Consumer Protection Act, 2019 the cases of consumer disputes are well classified for adjudication between National Consumer Disputes Redressal Commission, State Commission and District Commission. The recent Act has also introduced new authorities for effective implementation of the object of the law i.e. Central Consumer Protection Authority, State Consumer Protection Authority and District Consumer Protection Authority. Therefore, the Govt. should establish Green Tribunals at the State as well as District level so as to effectively resolve the complaints of violation of environmental laws. Also, constituting 'Green Police' as an enforcement wing will not only help in as well as monitoring of acceptability of environmental norms among various industries. Further, it's the need of the hour that the authorities should be provided with certain powers to take stringent actions the wrongdoers and create a fear among the others that an authority is right above their head to monitor them and restrict their unwanted actions.

4) Change in Govt. Policies-In recent years, Indian govt. has been primarily focusing on initiating schemes for promoting green infrastructure in India. Under PM SuryagharMuftBijliYojna govt. provide subsidies for setting up solar power plant. Further govt. is also providing subsidies for buying electric vehicle so as to promote greener transport.However, much intense changes in policies are required so as to develop sustainable infrastructure. One of such change is preparing active master plan for the Tier-1 cities. A new term has emerged for sustainable infrastructure known as 'Blue- Green' infrastructure. It refers to a network that provides the "ingredients" for solving urban and climatic challenges by a combination of infrastructure, ecological restoration and urban design to connect people with nature.Blue indicates water bodies such as rivers and tanks. Green indicates trees, parks, and gardens. Such an infrastructure should be a part of construction policy both residential as well as commercial. Every construction should be scrutinized by

pollution control boards in such cities. Gradually, it will become a practice and subsequently may be applied in tier-2 and 3 cities. Also, greener mode of transport can be promoted by developing purposeful infrastructure like installing charging stations at frequent distance, separate lane for electric vehicles, lower amount toll and other taxes for such vehicles, etc. Govt. should make contribution towards green infrastructure a mandatory part of Corporate Social Responsibility (CSR). This could enhance corporate assistance not only financially but also technically.

Conclusion: Development, and for that matter, sustainable development is contingent on access to resources necessary to live a reasonably good way of life, infrastructure included. Without any ambiguity, access to more resources would entail a higher level of development, the way we define development today. However, unrestricted access to resources could certainly jeopardize the sustainability and resilience of the developmental process. According to an ongoing temperature analysis by scientists at NASA's Goddard Institute for Space Studies (GISS), the average temperature of earth rose by a little more than 1^0c since 1880 and two-third of it was raised since 1975 roughly at the rate of 0.15^0c-0.20^0c per decade. Some may argue it as a normal raise as many nations witness a huge fluctuation of temperature only in a day. This one degree change is significant because it not only warm-up the oceans but also melts the ice at the poles. This again results in the rise of oceanic levels which is a real time threat to the coastal regions around the world. According to a latest report by NASA using the research of IPCC (Inter-governmental Panel on Climate Change), 12 coastal cities of India including Mumbai, Chennai, Vishakhapatnam could be 3-ft underwater by 2100.

On 3rd August 2023, the Indian Government released its Net zero emissions target policy to reduce its carbon footprints. To achieve the sustainable development goals (SDG), as specified by the UN, India is determined for its long-term low-carbon development strategy. Selfishly pursuing modernization, humans have frequently compromised with the requirements of a more sustainable environment.India's sustainable infrastructure is facing severe challenges due to the rapid pace of urbanisation. While there have been some efforts towards sustainable development, such as the Smart Cities Mission and the Atal Mission for Rejuvenation and Urban Transformation, these initiatives face various constraints such as inadequate financial resources, inadequate planning, and lack of public awareness.Moreover, is the need for better planning and policy frameworks to promote sustainable development. These should include a focus on integrated urban planning, which takes into account environmental sustainability, social equity, and economic growth. It is also essential to involve communities in the planning and decision-making process to ensure their needs and aspirations are considered.India must use this transformational moment to move from old 19th Century infrastructure to a wiser combination of green and traditional infrastructure that will meet the needs of the 21st Century.

References:-

1. United Nations, *Transforming Our World: The 2030 Agenda for Sustainable Development*, U.N. Doc. A/RES/70/1 (2015)
2. United Nations, *Sustainable Development Goals (SDGs)*, https://sdgs.un.org/goals.
3. World Bank, *Sustainable Infrastructure*, https://www.worldbank.org.
4. Intergovernmental Panel on Climate Change (IPCC), *Sixth Assessment Report (AR6): Climate Change 2023* (2023)
5. National Green Tribunal Act, 2010
6. Environment (Protection) Act,1986
7. Water (Prevention and Control of Pollution) Act, 1974
8. Air (Prevention and Control of Pollution) Act, 1981
9. Consumer Protection Act, 2019
10. Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India, https://moef.gov.in
11. Central Pollution Control Board (CPCB), *Annual Report* (latest edition), https://cpcb.nic.in.
12. NITI Aayog, *India's Long-Term Low Carbon Development Strategy* (2023).
13. Government of India, *India's Updated Nationally Determined Contribution (NDC)* (2022).
14. National Aeronautics and Space Administration (NASA), *Global Climate Change: Vital Signs of the Planet*, https://climate.nasa.gov.
15. NASA Goddard Institute for Space Studies (GISS), *GISS Surface Temperature Analysis (GISTEMP)*, https://data.giss.nasa.gov/gistemp.
16. United Nations Environment Programme (UNEP), *Global Environment Outlook* (latest edition).
17. United Nations University Institute for Water, Environment and Health (UNU-INWEH), *Groundwater and Water Security Reports*.
18. Mishra Committee Report, *Report on the Stability of Joshimath Township* (1976).
19. Ministry of New and Renewable Energy (MNRE), Government of India, *PM Surya Ghar: MuftBijliYojana*, https://mnre.gov.in.
20. Ministry of Housing and Urban Affairs, Government of India, *Smart Cities Mission Guidelines* (2015).
21. Ministry of Housing and Urban Affairs, Government of India, *Atal Mission for Rejuvenation and Urban Transformation (AMRUT)*, https://mohua.gov.in.
22. Intergovernmental Panel on Climate Change (IPCC), *Special Report on Global Warming of 1.5°C* (2018).
23. United Nations, *World Urbanization Prospects 2018*, Department of Economic and Social Affairs.
24. OECD, *Infrastructure for a Low-Carbon Economy* (2021).
25. Asian Development Bank, *Green Infrastructure in Asia: Policies and Practices* (2022).