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Environmental Education and Awareness

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Abstract

Interest in environmental problems has grown tremendously over the past decades and it is believed that environmental problems will continue to increase. it is clear that we have a major challenge to overcome the problem of environment problems. In India, natures are heavily affected by environmental degradation. To address these many problems and challenges, it is needed to take significant sustainable initiatives to address the country's many problems, including environmental degradation, in order to maintain its future prospects leading to sustained economic growth.

Eco system is the basic of the environment therefor it is necessary to maintain constant stability and restore environment for the future generation. survival is impossible without good and unpolluted environment, there are number of challenges face while maintaining and restoration of the pollution free environment. Being the global problem, many affords were made to eradicate the environment pollution and restore the wholesome environment for the batter living of the person. While doing so it is considered to be necessary to protection and conservation of the national resources as much as possible by way of implementing many nationwide programs to spread awareness and imposing the two basic principle of Stockholm declaration that is of precautionary and polluter pay principle implementation and enforcement of certain laws by way of penalising the polluter and imposing fine and in some severe cases imprisonment which will help to prevent the environment pollution.

India, exacerbated by high population density, and its size has increased the growth rate, which tends to expand and accelerate human impact on natural resources. Environmental degradation not only causes deterioration of natural conditions, but also has adverse effects on sustainable development and human health. Existing environmental laws seem to be ineffective and non- controlling, due to lack of enforcement, availability of resources, people's participation, environmental education-awareness and other technical problems

Introduction

Environmental pollution means the introduction of harmful and toxic substances into our environment. It is not limited to air pollution, but can also affect water bodies, soil, forests, aquatic life and all land-dwelling species. The main causes of environmental pollution are human activities.

Throughout the ages, we have interfered with the environment to expand our habitat and make life easier. People have invented cars, built factories, cut down forests to make roads and cities, all of which endanger the health of the environment. Inadequate garbage disposal and litter have polluted our oceans and waterways, rendering them useless and endangering the lives of the species that depend on them.

Pollution has a huge adverse effect on the environment, which leads to its degradation and also to a decrease in the number of living species. This has serious consequences such as acid rain, global warming, hunger, draft and extreme climate and other consequences.

If the pollution continues as it is today, the day will not be far when the sky will become cloudy and breathing will become difficult due to lack of oxygen. Continuous water pollution causes water shortage, hunger, drought and ecological imbalance. All living species and natural resources are gradually destroyed, leaving the Earth a barren and lifeless ball of mud and smoke.

It refers to the addition of harmful substances to our environment, making it dangerous for living things. Although some pollution is caused by natural events such as forest fires or volcanic eruptions, most pollution is caused by human activities. From car exhaust to industrial waste, humans are primarily responsible for air, water and soil pollution. This has serious consequences: polluted water can cause disease, dirty air can worsen respiratory problems, and soil pollution affects the food we eat. Marine life also suffers because many creatures use plastic waste for food. As future caretakers of the planet, we must understand the importance of sustainable living. By recycling, using public transport and supporting green initiatives, we can help reduce pollution and protect the environment.

With the change of time the seriousness of the environment challenged are increasing and so does the need of the environment awareness as it is the only way for the protection and preservation of the

heathy environment.

Environment Challenges

The prominent current issues include ozone and resources depletion, climate change, environmental degradation, endangered species and ecologically valuable natural areas, waste disposal, greenhouse effect, deforestation, overpopulation, solid waste management and most importantly global warming which require urgent attention.

The diverse effect of the human actives on the constantly changing environment demand for the high level of efforts and need for the awareness of the environmental issues as the danger of natural disaster is increasing day by day. some of the challenges are discuses in brief as follows: -

1) Ozone and resources depletion- the outermost gaseous layer which cover the earth which help to stops the harmful ultraviolet rays of the sun to enter in the atmosphere of the earth this gas is called as the ozone gas this layer of the gas is been destroyed due to the pollution in air caused by the domestic pollution and industries which spread pollution like chlorofluorocarbons as the long term industrial pollution have created the hole in the outer layer of the ozone gas result in the entering of UV rays which exposes the humans and animal causing skin dieses and cancer.

1) Solid Waste Management: - the problem of the dumping of the solid west created due to urbanisation and industrialization the quantity of the solid waste which include the collection of the west from different industries include domestic area transferring and transportation of that west to the dumping yard

2) Deforestation: - the importance of trees and plant cannot be denied when it come to the environment as the requirement of oxygen. the forest is a habitat for many wild animals and plants. Deforestation has caused the extinction of many plant and animal species which affects diversity

3) Overpopulation: - The earth's population is increasing drastically. It is estimated to be more than seven billion. The increasing population has led to a shortage of resources. If this continues, it will be very difficult to sustain such a huge population. The other environmental issues including pollution, waste management, deforestation, climate change and global warming are all associated with overpopulation.

4) Climate change: - the change in the average temperature and cycles of weather over a long period of time is said to be Climate change. Due to reduction of the sea ice and greenhouse gases which results into less sunlight reflects in to space causing ocean warming reduce the sea level even further this cause the change in the climate.

5) Endangered species: - An endangered species is a type of organism that is threatened with extinction. Species **are** endangered for two main reasons: loss of habitat and loss of genetic variation. Habitat loss can **occur** naturally. For example, dinosaurs lost their habitat about 65 million years ago.

6) Ecologically valuable natural areas, the number of efforts is conducted the globe level for the conservation of the protected area due to the environment degradation and climate change create maximum threat to the

7) Waste Disposal, It is important with measures that include collection and scientific treatment of waste that can reduce the risk of water, soil and air pollution removal, disposal, recycling or destruction of any materials which is of no use from agriculture, domestic use or industrial products are called as waste. Following the correct waste management methods ensures less pollution and environmental risks. proper waste management There can be many types of waste, and much of the waste generated today is non-biodegradable waste. Globalization and industrialization have had a huge impact on it. Landfills with hazardous materials can emit toxic fumes and smoke. Therefore, proper disposal of specific wastes is necessary, for example burning any waste can lead to the above problem and harm the body. Also, dumping in rivers and filling soil piles without proper management is not recommended. Garbage, including plastic, batteries, sanitary and petroleum products, must be disposed of properly. This can lead to a hazardous environment and a polluted atmosphere.

Waste management is an important term related to waste disposal and both go hand in hand to keep the environment clean. Therefore, the definition of waste management should include a waste management system. The 7 R's related to waste management are Refuse, Repurpose, Reduce, Reuse, Decompose, Recycle and Rethink. Following all these shedding steps will help you live a hygienic and healthy life. It is necessary not only for us, but also for future generations. It also prevents garbage collectors, landfill workers and other similar workers from

reducing the risks associated with improper waste management. It can cause blood infections, breathing and growth problems, skin irritation, etc. Thus, waste disposal should not depend on employees, but the concern should start in every home. The sorting of waste must be followed everywhere, including homes and shops. Sorting of biodegradable waste, non-biodegradable and toxic products should be followed.

2) Global warming or Greenhouse effect,

Human activity contributes to global warming by increasing the greenhouse effect. These naturally occurring gases in the atmosphere include carbon

dioxide, methane, nitrous oxide, and fluorinated gases, sometimes called chlorofluorocarbons (CFCs). So, they act like insulating glass walls in a greenhouse. Even a small increase in global average temperature can have a huge impact.

Glaciers and glaciers naturally advance and retreat. As the Earth's temperature changed, ice sheets grew and shrank, and sea levels fell and rose. Ancient corals found on land in Florida, Bermuda and the Bahamas show that 130,000 years ago the sea level must have been five to six meters higher than today. The earth does not have to be furnace hot for glaciers to melt. Northern summers in those ancient fossil days were only three to five degrees Celsius (5 to 9 degrees Fahrenheit) warmer than today. However, the rate of global warming is unprecedented. The effects are unknown

11) Disaster

Disasters are serious disruptions to the functioning of a community that exceed its capacity to cope using its own resources. Disasters can be caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community. Disasters can be caused by many different kinds of hazards—scroll down for examples—and can have devastating impacts on people and communities.

The frequency, complexity and severity of their impacts are likely to increase in the future due to factors such as climate change, displacement, conflict, rapid and unplanned urbanization, technological hazards and public health emergencies. But disasters can and should be prevented. We can prevent hazards from becoming disasters by helping communities to be prepared, reduce their risks, and become more resilient

Legal Provisions

After the long-term international evaluation on the environment protection and conservation. Some principles were led down in the Stockholm Declaration on Human Environment 1972

Which is specifically regarding the challenges faced in the environment protection and importances of spreading environment awareness. As Principal 18 says that it is futile to think of environment protection without creating awareness about environment matters. Nation should prepare the action plan for the protection and conservation of the environment. As all other principles which puts more emphasise on the cooperation and coordination among the state and adopt proper national planning and legislation to be implemented at the domestic level for the same the state should assign the responsibility to the organisation. Also, the importance was given for the assistance from the developed countries to the developing countries as the issues faced by the developing nation are maximum due to the poverty and lack of industrial and technological development and need of the basic facilities. One of the important Pease of legislation is The Environment Protection Act, 1986. The Constitution of India contains specific provisions for environmental protection under the chapter on Principles of State Policy and Fundamental Duties. The fact that there is no specific provision in the constitution that recognizes the fundamental right to a clean and healthy environment is the reason for the recent legal activism.

- Articles 48-A and
- Article 51-A. Clause (g)
- Article49-A: Article 51-A (g) which deals with Fundamental Duties of the citizens states: Article 253
- Role of the Supreme Court in environmental protection for the implementation of the environmental principal such as Polluter pays Principle in Vellore Citizens Welfare Forum v. Union of India. In M.C Mehta v. Union of India and Others (Calcutta Tanneries Case),
- Precautionary Principle in M.C Mehta v. Union (Taj Trapezium Zone TTZ)
- The doctrine of public trust in in M.C Mehta v. Kamal Nath, 1997,

Environmental Education and Awareness program.

Environment education is the continues process where a person should get informed about all the aspects of the environment issues to understand the concept of the environment its importance and to adopt the process for the restoration and conservation of environment it is important to spread the awareness at all the areas covering the different issues faced at different level

There are number of environmental programs were framed at international and national level for the protection and conservation of environment through the government origination or non- government origination including individual level The Government of India launched various programs and used audio-visual media to educate people and create awareness to protect the environment.

In February 1971, the University Grants Commission (India) was launched in collaboration with **other** organizations. Symposium on Development of Environmental Science in Indian Universities. A consensus was reached at the symposium that ecology and environmental subjects should be part of study courses at all levels**.** the goal is to raise awareness of the need to maintain ecological balance. To keep the environment clean and prevent pollution and ecological imbalance**,** the Faculty of Law**,** Punjab University, Chandigarh organized a three-day

National Seminar in 1984 on "Environmental Protection Act**".**

Fifty-five delegates from all over India participated in the seminar. Environmental education mainly focuses on the following:

(i) Overpopulation and ways to **control** its rapid growth.
(ii) Forestry to prevent soil erosion and water pollution
(iii) Methods to prevent air pollution through smokeless cooking**.**
(iv) Radio and television reproduction discipline and the prohibition of using loudspeakers.
(v) Basic information on the scientific and philosophical basis of man and the environment
(vi) rules for the disposal of household waste; and
(vii) general principles of sanitation.

The double impact of climate change and the loss of biodiversity is a major threat to the achievement of the Millennium Development Goals, especially the goals related to environmental sustainability, poverty alleviation, and food and water security. Growing awareness of the planet's vulnerability to human-induced change also offers an opportunity to highlight the many values of natural ecosystems and the services they provide.

Nature reserves, integrated into land use plans as part of larger and interconnected conservation networks, offer practical and concrete solutions to both species' loss and climate change adaptation. Habitats contribute significantly to mitigation by storing and sequestering carbon in vegetation and soil, and to adaptation by maintaining essential ecosystem services that help societies respond to and cope with climate change and other environmental challenges. Many protected areas could be justified on socio-economic grounds alone, but their many goods and services are largely ignored in national economic calculations.

This paper argues that there is a compelling case for greater investment in expanded and better- connected protected area systems under multiple management and governance systems specifically designed to address threats from climate change, increased demand and changing resource use patterns. The new conservation areas agenda requires an even wider range of actors and rights holders, with an increasing focus on the protected landscapes and seascapes of indigenous peoples, local communities, private owners and other parties, complementing government-managed protected areas. agencies More attention must also be paid to ways of integrating and incorporating protected areas into sustainable development, including the promotion of so-called green infrastructure as a strategic part of combating climate change.

Conclusion

Connecting Human Rights and the Environment is a valuable sourcebook that explores the uncharted territory between environmental and human rights law. People can enjoy fundamental equality and adequate living conditions in an environment that enables human dignity and well-being. Laws must be drafted quickly, considering that polluters or destroyers

of the natural environment not only commit a crime against nature, but also violate human rights. Health indeed seemed to be a topic that bridges the gaps between environmental protection and human rights. Human rights and the relationship between environmental promotion would enable the integration of human rights principles such as anti-discrimination standards, social participation and the protection of vulnerable groups in the environment.

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Environmental Audit Requirement by The National Assessment and Accreditation Council – A Step Towards Environmental Sustainability

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Abstract:
In Centre for Environmental Law, WWF-I vs U O I &Ors[i] SC
declared that Art 21[ii] not only protects the human rights but it further casts an obligation upon human beings to protect and preserve a specie from becoming extinct; conservation and protection of environment is an inseparable part of right to life[iii]. The Public Trust Doctrine regards the State as the custodian of the common properties and natural resources and requires the State to safeguard them for human beings, flora, fauna etc[iv]. All institutions of State are under the constitutional duty to improve the quality of environment in all ways. We have a variety of Higher Educational Institutions (HEIs)- universities, institutions of national importance, research, scientific, technical and professional educational institutions apart from under graduate and post graduate institutions.Theyoccupy a considerable space in our environment. Many of them, particularly the hi end institutions are housed in huge buildings that have cleared the natural environment or have at the least severely intruded into the natural environment of the places where they have risen. Most of them have number of lecture halls, laboratories, libraries, hostels, workshops, computer labs, lifts, sport facilities and so on. Usage of vehicles, computers, large number of electronic goods, water, paper, electricity, chemicals, tissues other resources by these institutions do attract audit and mitigation. The regulating authorities must nudge the educational institutions towards fashioning their activities in such a way that strengthens environmental sustainability.

Environmental Audit (EA)or Green Audit of Higher Educational Institutions (HEIs)is a systematic,periodicand independent investigation of the current state of affairs regarding
1)the procurement and use of resources
2) handling of wastes generated
3) monitoring the conduct that impinge on the environment within the campus and in its neighbourhood
with a view to comply with
environmental standards imposed by law and/or self- laid policy of regulation of affairs as an environmentally sensitive and responsible organization andfor the purpose of constantly rising in the contribution towards sustainable environment. National Assessment and Accreditation Council(NAAC) well known as the Quality Watch Dog that accredits HEIs requires EA of the HEIs. NAAC ratings have been a factor in motivation of various HEIs across the nation to focus on quality and improvement. In their annual reports and 5years Self Study Reports, the HEIsprovide information to NAAC on wastes handling, rain water harvesting, green audit, energy audit etc for assessment and accreditation. The chief objective of this paper is to study NAAC criteria requiring green audit of HEIs as a forward step to integrate ecological considerations in the governance of HEIs and to enhance their role in ensuring sustainable environment. The positive steps of the HEIs will certainly have a good impact on the students' realistic environmental education too. India, ie Bharat has a vast territory wherein the HEIs occupy significant space. It is their institutional responsibility to the society to play a leadership role in environmental sustainability. This paper seeks to analyse the NAAC requirement ofEA in the accreditation process, its weightage in the overall quality parameters, the nature of compulsion of EA and environmental quality consciousness throughout the process.

About NAAC and its process

NAAC, an autonomous body funded by the University Grants Commission, accreditsHEIs across India upon assessment on different quality paraments in a 7 criteria scale. It is headquartered in Bangalore. The assessment and accreditation by NAAC is upon submission of the intending colleges and universities the information and

intent to undergo assessment and accreditation with fees. NAAC approval of the information leads to the college submitting Self Study Report in the format prescribed; that report is based on last 5 years data and again fees will have to be paid. NAAC will assess the report and intimate whether the college has prequalified and whether it is eligible for Peer Team Visit for further assessment before accreditation. Remaining fees and Peer team visit fees for logistics is also to be paid. With the last step of the Peer team visit, NAAC certifies the college as assessed and accredited with a letter grade- eight grade ladder- that may be A++/A+/A/B++/B+/B/C/D or may certify that the college is not eligible to be accredited. The system of ranking is based on the Cumulative Grade Point Average (CGPA) gained by an institution.The certificate is valid for 5 years; HEIs must undergo this process every 5 years. After assessment and accreditation, the colleges must submit Annual Quality Assurance Report every year. The quantitative matrices will carry 70% and the remaining 30% is for peer team verification of qualitative matrices.[v]

Annual report after Accreditation:

Annual Report is mandated for submission online in the format prescribed.The formats are slightly different for Universities, Affiliated Colleges UG, Affiliated Colleges PG and Autonomous Colleges. Criterion7 is about Institutional Values and Best Practices. Thiscriterion includesthe requirement of Quality audits on environment and energy regularly undertaken by the Institution. From 2019-20 only, NAAC required information on Green Audit from all HEIs[vi].

Self- Study Report (SSR):

SSRinformation is required for7 criteria. The 7th Criterion on Institutional Values and Best Practices carries a weight of 10% in the NAAC process. This criterion is divided into 3 components: Institutional Values and Social Responsibilities,Best Practices, and Institutional Distinctiveness.First component ‘s 7.1.2 to 7.1.6.arerelating to GA although there are 6 other subdivisions.

Information on HEI’s initiatives in the following are to be furnished-

7.1.2Environmental Consciousness and Sustainability/Alternative Energy initiatives such as Solar energy, Biogas plant, Wheeling to the Grid ,Sensor-based energy conservation, Use of LED bulbs/ power efficient equipment

7.1.3Facilities for the management of the following types of degradable and non-degradable wastes- Solid waste management, Liquid waste management, Biomedical waste management, E-waste management, Waste recycling system.

7.1.4Water conservation facilities like rain water harvesting, Borewell /Open well recharge, Construction of tanks and bunds, Waste water recycling, Maintenance of water bodies and distribution system in the campus.

7.1.5 Green campus initiatives likeRestricted entry of automobiles, Use of Bicycles/ Battery powered vehicles, Pedestrian Friendly pathways, Ban on use of Plastic, landscaping with trees and plants.

7.1.6Quality audits on environment and energy regularly undertaken by the Institution and awards if any received for such green campus initiatives such as Green Audit, Energy audit, Environment audit, clean and green campus recognitions / awards, Beyond the campus environmental promotion activities[vii]

NAAC’s new process from December 2024

The NAAC process has come into limelight recently because Reforms 2024 are notified.[viii] As on 7/2/2024 458 universities and 9824 colleges have NAAC Accreditation.[ix] Government of Maharashtra has made NAAC mandatory for aided colleges and notified that the colleges will not be permitted to admit students for academic year 2023-24 although it had not cracked the whip.[x]

NAAC has notified that the process in vogue currently has been revised and transitioned into i) a binary system from December 2024 to motivate a quality culture and promote accreditation, NAAC has adopted a system where there will be accredited/non accredited HEIs.

ii) a maturity based graded accreditation (levels 1 to 4) of Institutions of National Excellence and Level 5 Institutions of Global Excellence for Multi-Disciplinary Research and Education.

The validity period for accreditations from January 2025 will be 3 years. There will be 10 different attributes on which inputs of the institution will be assessed. The weightage for peer team visit and verification is increased to 40%

The new binary accreditation and the maturity-based accreditation require inputs to be given on 10 attributes about the processes, outcomes and impact. The last attribute is on sustainability and it includes monitoring of the environmental qualityof the institution and its surroundings by energy audit, carbon sequestration, measuring air pollution, water budgeting, maintaining clean and green campus, out of campus initiatives

EAas a quality parameter: clarity,adequacy and cost

NAAC accreditation is voluntary and is yet to catch up with all HEIs in the country[xi]. MandatoryGA has a fabulous role in making HEIs sensitive and ever conscious of the activities in the campus that can impact the environment and to mitigate the adverse impacts and advance towards sustainability in the campus. The audit and the implementation of the mitigation measures will bring immense benefits to the people in the campus and around. The students and staff will shape up their personal and social responsibility towards the environment. The environmental awareness and safety values will get a booster shot. This will give an opportunity to all to fulfil the constitutional duties to protect and improve the environment[xii] and to strive towards excellence.[xiii]GA will certainly result in redesigning educational infrastructure and practisesthat will strengthen ecological security.

Environmental laws on HEIs –

Constitution of India mandates the State to protect and improve the environment and safeguarding of forests and wildlife.[xiv]Industries are governed byseveral legislations to control pollution[xv] and rules framed thereunder.[xvi] Environmental clearancesfrom MoEFCC are mandatoryfor intensive projects.[xvii]However, there are not manyenvironmental mandates upon educational institutions. In this backdrop the NAAC's nudge for GA is salutary. Nowadays local bodies across the country require rain water harvesting for new buildings including educational institutions. Biomedical Waste (Management) Rules 2016 that apply to hospitals, pathological labs etc apply to veterinary institutions, research and educational institutions and first aid rooms of schools too. R 3 (f) defines "bio-medical waste" as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps, including the categories mentioned in Schedule I appended to these rules; There are strict rules as to handling and disposal of these wastes. The recent E Waste (Management) Rules 2022 apply to every manufacturer, producer refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, refurbishing, dismantling, recycling and processing of e-waste or electrical and electronic equipment listed in Schedule I, including their components, consumables, parts and spares which make the product operational. Rules 5 to 10 impose duties regarding e waste.

R. 3(1)(l) defines: *'e-waste'* means electrical and electronic equipment, including solar photo-voltaic modules or panels or cells, whole or in part discarded as waste, as well as rejects from manufacturing, refurbishment and repair processes;Interestingly HEIs are "bulk Consumers"; R 3(1)(b) defines 'bulk consumer' as any entity which has used at least one thousand units of electrical and electronic equipment listed in Schedule I, at any point of time in the particular Financial Year and includes e-retailer; Schedule I provides a long list of electronic and electric equipments including computers, laptops, printers, telex, cellular phones, Scanners, Routers, Inverters, Modems,video cameras,sound amplifiers, freezers, electric stoves, hotplates, electric fans, vacuum cleaners, electric fans, kettles, heaters etc. HEIs easily consume 1000 and more of these equipments. 2011 e waste ruleshad included the educational institutions explicitly as bulk consumers. As bulk consumersHEIs mustensure that e-waste generated by them shall be handed over only to the registered producer, refurbisher or recycler[xviii]. Any failure or contravention is punishable with imprisonment for a term which may extend to five years or with fine which may extend to one lakh rupees, or with both and in case the failure or contravention continues the punishment is more stringent.[xix]

Definition of EA-

The requirements of NAAC donot clearly define EA. Moreover, in SSR 7.1 it seeks information on green campus initiatives including green audit, energy audit and environment audit. There is an omission to clarify whether there is any distinction between green audit and environmental audit or it meant information on quality audit that may be called green audit or environmental audit. In the reforms 2024 tooEA is required and hopefully we can see that NAAC becomes a great catalyst to make HEIs contribute more meaningfully to environment sustainability. The definition becomes crucial as EA has several components and it must be clear as to what are essentially required. EA comprises of-

- Energy audit (alternative energy sources, energy efficient appliances,sensor-based energy conservation)
- Water usage
- Wastes handling (solid wastes, bio degradable, plastic, e wastes, biological wastes, chemical wastes, liquid wastes, sewage, biogas plant)

- Recycling of wastes, minimising wastes
- Carbon sequestration
- Measuring air pollution
- Water budgeting
- Environmental education
- Care of flora, fauna of campus
- Care of green area
- Landscaping
- Nursery of plants
- Tree planting
- Rain water harvesting
- Restricted entry of automobiles, Use of Bicycles/ Battery powered vehicles
- Pedestrian friendly pathways
- Rationalising use of paper and adopting paperless practices

Nature of EA compliance and list of credible auditors-

Compliance of how many components will mean full compliance is not clear. Further there are no guidelines as to how the EA is to be done and who are eligible as independent and credible auditors to do the EA. NAAC has nowhere provided any list of reliable environment/green auditors. However, NAAC requirement of EA has led to emergence of green auditors for HEIs. A clue may be taken from R. 10 of the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 that stipulates that the safety audit reports to be submitted by the industry must be carried outby an independent safety expert not associated with such industrial activities.

Eligibility for accreditation &weightage for EA- NAAC doesnotprescribe GA as eligibility manner of compliance. criteria for accreditation. No HEI is debarred from the NAAC process for want of annual EA. Further EA is only a minor requirement in one of the criteria that has 10% weightage for accreditation.

EA compulsion for Grade and cycle-

It is further surprising to note that even for the highest grade there is no compulsory EA. The grade will depend on the scores and the CGPA that the institution has obtained. In the same breath it is to be noted that even for 3rd or 4th cycle there is no compulsory EA although incremental advancement from the previous cycle is considered. Even if some improvements are there otherwise than EA, the assessment will notadversely impact HEI.

Cost-

NAAC process involves substantial cost. A simple mono-faculty single degree law college paid Rs 6,19,500/ in Dec 2023. Maharashtra Education Minister appealed for reforms and voiced against the high fees charged by NAAC and opined that the fees should not go beyond Rs 1,50,000/.[xx] The impact of 2024 NAAC process reforms on cost is yet to be known. it is noteworthy that the cost will recur every 3 years under the 2024 process. Government should ensure availability of credible green auditorsby taking clue from the Energy Conservation Act, 2005 that governs the energy auditors.[xxi]

NAAC has a golden opportunity to strengthen environmental sustainability by mandatingEA as an eligibility condition for accreditationof HEIs, definingEA and laying down the

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Dr Srividhya Jayakumar

11. Art 51A(f) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement
12. Art 48A
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Endemic wildlife - their unique importance for nature as a whole, why they are indispensable for biodiversity

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Abstract

Large buildings that are replacing wood everywhere pose a serious threat to Earth's ecological equilibrium and can result in a number of catastrophic events. It makes many natural disasters more likely. The areas are now devoid of the many wildlife species that once called them home. India's wild animal population is fast dwindling. In our country, numerous bird and animal species are extinct, including the Asiatic cheetah, Indian aurochs, and pink-headed duck; other species, like the Bengal tiger, Asiatic lion, and Indian rhinoceros, are in danger of becoming extinct. It was a significant issue that warranted the enactment of laws to protect animals.

The diverse plants and animals that make up a certain area as a whole are referred to as wildlife. Stated differently, wildlife includes all non-domesticated animals as well as plants and other organisms found in such wild environments.

In order to preserve the harmony and health of their specific ecosystems, endemic wildlife is essential to the planet's total biodiversity. To appreciate the complex web of life and the need of protecting these species' habitats, one must have a thorough understanding of these species' significance.

This article will examine the essential function of endemic animals in the overall ecosystem, emphasising their ecological relevance, financial worth, and possible negative effects on the environment should they become extinct. Acknowledging the significance of these species allows us to support conservation initiatives and guarantee the long-term survival of endemic wildlife as well as the landscapes they call home. At this juncture, examining the role of international laws, conventions, the Indian judiciary, and the Constitution of India to protect and conserve endangered wildlife is crucial.

Key Words: Wildlife, Endemic, Endemism, Species, Biodiversity, Environment

Introduction

India is a nation with an abundance of both plants and animals. Approximately 10% of the world's species are found on this territory.

The International Union for Conservation of Nature estimates that 7–8% of all species, including both flora and fauna, are found in India. Below are the statistics:

- Roughly 45,000 plant species exist, making up 7% of all species on the planet.
- There are almost 15,000 blooming plants, making up 6% of all plants on Earth.
- Approximately 91,000 different species of animals exist, including fish, insects, birds, mammals, amphibians, mollusks, and reptiles.
- Sheep, cattle, and goats are among the 449 species of livestock that exist today.

climate change[i],in the first few decades of the twenty-first century has helped to increase awareness among people of the significance of protecting and preserving the world, especially its flora and fauna. Since the effects of Biodiversity loss[ii] extend beyond the extinction of species,[iii] they pose a threat to human safety because they affect the soil and water, which are vital to our food supply. In fact, biodiversity loss is one of our biggest concerns. The Sustainable Development Goals[iv] (SDGs) of the United Nations[v], particularly SDG 14[vi] and SDG 15[vii], provide a roadmap for reversing these losses and emphasise the significance of endemic species.

Endemism and Endemic species

Endemism is a term used in biology to describe the distribution of a taxon that is restricted to a small geographic area and may thus be found naturally in that location.

Endemic species are those that reside in a specific location, such as a mountain range, lake, or island, among others. As a result, the ecological element of the environment, as well as the biological qualities of living organisms, has an impact on this condition. Endemic species are very vulnerable species[viii] and, as a result, are most at risk of extinction, which can be caused by natural forces or human activities. Other risks include poaching, altering ecosystems, and the introduction of exotic species, in addition to the effects of climate change.

In reality, there are 17 mega diverse countries[ix] in the world, which contain at least 70% of the planet's terrestrial biological variety, cover just around 10%

of the area but have a large number of endemic species.

Endemic wildlife and its importance in Biodiversity

Epidemic species are of utmost importance for preserving and increasing the biodiversity of their geographic region. They guarantee that the ecological functions of the ecosystems they occupy run smoothly. Endemic species teaches us that every living creature plays an important part in the preservation of biodiversity.

Carnivores rely on herbivores, whereas herbivores rely on plants. As a result, any dramatic ecological disruption might cause their collapse, rendering the ground barren and unsuitable for any living thing. A native species has developed naturally in a certain ecosystem as a result of processes like natural development and dispersal. For example, koalas are native to Australia. The introduction or influence of native species into the region was not caused by human activity. Native species are another name for indigenous species. Numerous unique and beautiful endemic species of plants and animals stand out from other life forms, often serving as a reminder of past occurrences. In India some of the species like Nilgiri Langur, Nilgiri, Tahr, Purplefrog https://animalia.bio/stop[x]_war are some rare bird species that will never be seen again. Similar tragedies involving the eradication or serious harming of endemic species due to non-native or invading species have happened in numerous distant biomes.

Elements influencing indigenous species and types of endemic species

Almost 60% of the endemic species in India are found in the Himalayas and the Western Ghats. Endemic species are mainly concentrated in the regions of North-East India, North-west Himalayas, Western Ghats, and Andaman and the Nicobar Islands.

Taxonomic classification: Biologists that specialize in endemism take into account not just species but also the most restrictive category of organisms. In addition, they examine the higher-level categories of genus, order, and family. Because of the nested nature of these hierarchical groupings, an order of animals and plants typically consists of numerous families, each of which contains several genera, or genus. The term "taxonomic levels" refers to these levels of division or classification.

Allochthonous: There are two common ways that plants and animals can become endemic. Some are born to grow in a certain location, assimilating into the local environment and persisting within its bounds. This kind of endemism is known as autochthonous, meaning it is indigenous to the environment in which it lives. Allochthonous refers to an endemic species that was once found elsewhere but has since lost most of its former geographic range.

Taxonomic Relics are also closely related to Geographical Relics. One of the numerous related species that inhabited Asia 100 million years ago, for instance, was the ginkgo tree. There is currently only one genus in the family Ginkgo ales. Similarly, only the deep seas of Madagascar's Indian Ocean are home to the uncommon fish known as coelacanth. It is the only surviving member of an extensive group that was very popular hundreds of millions of years ago. Dinosaur remnants, elephants are. There were 25 distinct species in the Elephantidae family millions of years ago. Only two species, however, still exist today; the other two are found in Africa and Asia.

Paleoendemism: The organisms with a lengthy evolutionary history whose endemism is frequently brought about by physical constraints, such as those found on islands.

Microendemic: species that have become established in a particular region.

Quasiendemic: species that go beyond the bounds of their own region.

Semiendemic: species who visit a particular location for a portion of the year.

Schizo Endemism: are species that shared similar physical and chromosomal traits but were developed by gradual separation.

Apo endemism: these species are derived from others and are found in smaller areas than their ancestors.

Wildlife and its preservation in India, through different legislative frameworks.

The Wild Life (Protection) Act, 1972 is an Act introduced by the Parliament of India on August 21, 1972, and later implemented on 9 September 1972. This Act was enacted with the object of protection of plants, birds and animal species.

A general law protecting wild animals and plants is called the Wildlife Protection Act. There weren't many national parks in existence when this Act was passed. This Act covers hunting, harvesting, and other related ancillary matters in addition to the preservation of flora and animals. This Act contains 66 sections and six schedules. A variety of penal provisions are also outlined in this Act for violation of any of the laws it contains.

Constitutional provisions

1. Part 4 of the Indian Constitution[xi] contains the Directive Principles of State Policy. It contains Articles 36[xii] to 51[xiii]. Which is known for the novel features of the Indian Constitution. Article 48-A[xiv] of the Indian Constitution states that the State shall try hard to achieve a clean environment, protect and improve the environment, and safeguard the wildlife and forest of the country.

2. Part 4-A of the constitution contains the Fundamental Duties. Fundamental duties are the moral obligation of all the citizens of the country. Article 51A(g)[xv] of the Indian Constitution states that it is the duty of every citizen to protect the natural resources like lakes, rivers and also wildlife. It also says that every citizen should have compassion for living creatures.

Some of the objectives of Wild Life (Protection) Act, 1972

1. One of the main objectives is to make hunting of wild animals, various bird species, etc. illegal.
2. To effectively govern human conduct and achieve the objectives of this legislation, a variety of sanctions are established for violating laws and regulations.
3. A number of Schedules included in this Act provide total protection for specific endangered species, allowing for their conservation.
4. To provide a home for animals that are secure but still in need of safety and protection.
5. To huntable animals like ducks and deer that are under special protection. To hunt these species, the hunter needs to obtain a licence from the District Officer. Even if the licence was revoked, he would still be able to shoot the animals in a certain area during a designated season.
6. To support the Convention of International Trade in Endangered Species of Fauna and Flora (CITES,1976)[xvi].
7. In order to facilitate the 1971 introduction of the Man and Biosphere Program's national component by UNESCO.
8. Even to safeguard certain plants that are in danger of extinction.
9. To outlaw the sale or other commercial exchange of specific protected species.
10. To permit the acquisition, sale, and transfer of licences in order to facilitate the trade and commerce of certain wild species.
11. To preserve both the nation's rich diversity of flora and animals in addition to a sound ecological balance.

CITES (CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an International agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species.

Object of CITES: CITES does not supersede national laws, even if it is legally binding on the Parties, requiring them to execute the Convention. Instead, it offers a framework that each Party must abide by. To guarantee that CITES is applied nationally, each Party must enact its own domestic laws.

With 184 Parties[xvii] as of right now, CITES has been one of the conservation accords with the largest membership for a long time. International collaboration is needed to manage the cross-border trade in wild animals and plants in order to protect specific species from overexploitation. It was with this spirit of cooperation that CITES was conceived. More than 40,000 different species of plants and animals are now protected to varied degrees by it, regardless of whether they are traded as live specimens, fur coats, or dried herbs.

Landmark Case Laws in India

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3. Suresh Kumar v State of Kerala[xx] https://www.casemine.com/judgement/in/634d2fc3d861bc154b503f5e
4. Union of India v Zavaray S. Poonawala & ors[xxi] https://www.casemine.com/judgement/in/5790b244e561097e45a4e275
5. Marine Fins v Union of India[xxii] https://www.casemine.com/judgement/in/5dc071b83321bc77c5084a2a

Conclusion

India is endowed with an enormous variety of natural resources, which is a blessing. Its animals and flora are diverse. These resources need to be reserved and safeguarded.

Through an examination of the ecological relevance, economic worth, and probable repercussions of their extinction, we have examined the essential role that endemic wildlife plays in the overall functioning of nature in this article. The long-term existence of endemic wildlife and the environments they live in can be ensured by supporting conservation efforts and acknowledging the importance of these species.

The Wildlife Protection Act of 1972 came into effect for the same purpose. The amended Act of 2002 brought about a number of modifications. This Act serves as a kind of blanket protection for many types of plants and animals from unlawful commerce, killing, and poaching of wild animals. This Act is broken up into eight chapters with sixty sections. This Act gives both the federal and state governments the authority to designate any region as a national park or sanctuary. In order to safeguard indigenous species and fauna, a number of limitations are in place. The globe as a whole may prevent global warming and preserve and balance biodiversity by heeding the advice given in this article and putting numerous national and international laws and conventions into practice.

Asst. Prof. Hetal Laherchand Meisheri.

Recommendations:

Based on the research findings, the following recommendations are put forth in this paper;

- Boost initiatives to save and maintain indigenous wildlife's habitat, with a particular emphasis on maintaining an ecosystem's integrity and connectivity.
- putting into effect laws and procedures that support resource management and sustainable land use in order to lessen habitat degradation and fragmentation
- Increase public understanding of the value of endemic species and the significance of biodiversity conservation for the health of ecosystems.
- Encourage and provide funding for additional endemic wildlife studies to improve our knowledge of their ecological importance and possible conservation tactics.
- We can help in preservation of global biodiversity and secure a sustainable future for both nature and humans by considering this proposal and giving priority to the protection of endemic wildlife.

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India's Climate Change Policy: Obstacles and Suggestions

"What is the use of a house if you haven't got a tolerable planet to put it on?"
— Henry David Thoreau

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Abstract

India's ecology and economy are facing serious problems due to the serious problem of climate change. With a rapidly growing population and expanding urbanization, India is vulnerable to a range of climate-related impacts, including water scarcity, extreme weather events, and shifting agricultural patterns. The rising temperatures have led to more frequent heatwaves, affecting public health and increasing energy demand for cooling systems. Because of the melting of the Himalayan glaciers, millions of people who rely on rivers fed by glaciers for drinking water and agriculture could soon run out of clean water. Additionally, changing monsoon patterns are disrupting farming practices and food production. It is crucial for India to implement effective adaptation strategies and mitigation measures to address these threats and build resilience against future climate risks. Collaboration with other nations on climate action is essential to ensure a sustainable future for all.

Keywords: *United Nations, Climate Change, Domestic Laws, India, and Global Warming*

Introduction

Historically, the earth's climate was perceived as static until the mid-twentieth century. However, it is now widely recognized that the climate is in a perpetual and intricate state of flux. Change is an inherent and fundamental characteristic of our environment. As the climate undergoes continuous transformations, even minor alterations can have far-reaching consequences on vital resources such as food and water. The global climate is impacted by several factors, including the amount of solar energy received by the earth, atmospheric conditions, the shape and rotation of the planet, and the intricate processes of the ocean. Notably, the atmosphere is experiencing a warming trend that is expected to persist. Scientists have predicted that by the year 2050, the world's average temperature will rise by an average of 1.5ºC to 4.5ºC. A Task Group established by the WHO (World Health Organization) has issued a warning about the potential serious impact of climate change on human health. It is anticipated that climate change will worsen existing health problems and may also introduce new and unexpected challenges.
India is currently confronted with the pressing issue of climate change, which has brought about a wide array of adverse consequences including extreme weather events, the melting of glaciers, and rising sea levels. The country's significant dependence on agriculture makes it extremely susceptible to the impacts of climate change, as rainfall patterns are crucial in influencing crop productivity. In recent times, there has been a noticeable rise in the frequency as well as the intensity of droughts and floods, leading to significant reductions in crop yields and posing a threat to food security. Furthermore, the melting of Himalayan glaciers poses a grave concern as it endangers the availability of freshwater resources for millions of people residing in the region.

Fighting climate change's negative effects on the environment is a very important aspect of the current global policy-making process. The entire globe has become engrossed in the problem of climate change, mostly because mankind has been responsible for it.[i] The climate of Earth is ever-changing. Nonetheless, the climate of the earth has radically changed during the past century. The temperature of the earth has increased, and this has had an immediate impact on health, small islands, coastal areas, and food security, among other things.[ii] The entire issue of climate change is, in one way or another, largely a result of how people have lived, particularly throughout the urbanization and industrialization eras.[iii] Though the world society has only recently been aware of this issue, the discussion surrounding climate change has fortunately started and will probably only become more intricate as more people attempt to discover solutions. However, a discussion on climate change cannot occur if the idea of 'responsibility for damage to the environment' is excluded.[iv] The global community has deliberated on the issue of determining accountability for the environmental harm that has transpired, as well as the potential for establishing a legal framework to prevent climate

change and future damage. It is imperative for all nations, including both developed and developing countries, to assess their domestic laws and policies as a crucial step towards averting further environmental deterioration. Developing nations, in particular, may find themselves grappling with the challenge of balancing economic growth with environmental preservation. In view of the aforementioned, this article investigates the legal implications of climate change in India.

An Overview

Climate change is currently impacting every country worldwide. The situation is causing loss of life, disrupting economies globally, and incurring substantial financial costs for individuals, communities, and nations both presently and in the long term. Individuals are experiencing notable impacts of climate change, such as alterations in weather patterns, escalating sea levels, and a surge in extreme weather occurrences. Those who are poor and most at risk are most affected.[v] The definition of climate change given by the UNFCCC (United Nations Framework Convention on Climate Change) is "a climatic shift that, in addition to the natural variability in weather patterns over similar time periods, is thought to have human influences as a whole, changing the global atmospheric composition." The UNFCCC gives the parties a framework for addressing the causes of climate change. [vi] To put it simply, global warming, often known as climate change, is a rise in the average global temperature that will mostly harm ecosystems worldwide.[vii] The detrimental consequences of climate “change on people's lives have already been brought on by the overuse of natural resources and rising environmental pollution. The present state of human health and safety is projected to get worse with a rise in the average world temperature.[viii] Furthermore, it is projected that the detrimental effects of climate change will force billions of people—primarily those in poor nations—to endure severe food and water shortages as well as greater dangers to their health and survival over the course of the next several decades.[ix] Climate change may have a substantial impact on the biological and physical processes of aquatic, terrestrial, and marine ecosystems. These effects could show themselves in a variety of ways. Some of the hazards linked to the phenomenon of climate change include reduced crop yields, the melting of glaciers, extreme weather events such as storms, droughts, & floods, increased coastal flooding, and” animal extinction.[x]

Climate change has brought about complex discussions in the fields of science and economics, but the legal implications of this issue have not received the attention they deserve.

Climate Change and India:

Due in large part to its varied geography, South Asia, and notably India, will be severely impacted by climate change in the near future.[xi] Given that the nation is quickly draining its natural resources and damaging its ecosystem, primarily as a result of "urbanization, industrialization, and economic growth," climate change is predicted to have a significant influence on this region.[xii] When it comes to safeguarding its rapidly diminishing natural resources, India is confronted with a concerning environmental and economic problem. The quality of the air and water is deteriorating daily as a result of a rise in different pollutants in the atmosphere. Furthermore, the nation's “coastal ecosystems, biodiversity, as well as agricultural output are the sectors most likely to be impacted by climate change.[xiii] In addition, the area has already experienced landslides, floods in Uttarakhand in 2013, floods in Chennai in 2015, and drought in 2016. Additionally, there is proof that the frequency and/or intensity of many extreme weather occurrences, like protracted dry spells, heat waves, as well as heavy rains, have increased noticeably. Such calamities can have detrimental effects such as hunger, increased susceptibility to illnesses, and loss of livelihoods and funds.[xiv] The World Bank predicts that an increase in the global average temperature of 2°C over the next few eras will only enhance the unpredictability” of the monsoon of India. It is anticipated that changes in India's rainfall patterns may submerge certain regions and leave others with very little water even for drinking.[xv] Since rain supports more than 60% of India's agricultural land, changes in precipitation patterns brought on by climate change pose a serious threat to the country. An estimated 63 million people's access to enough food may be impacted by the continued reduction of water for agricultural production in the Ganges, Indus, & Brahmaputra River basins by the 2050s due to a 2°C to 2.5°C rise in temperature over pre-industrial levels. [xvi] Reliable water supplies in India are seriously threatened by the melting of glaciers as well as the loss of snowfall. Due to their heavy reliance on snow and glacial meltwater, major rivers like the Indus, Ganges, and Brahmaputra are particularly susceptible to the negative effects of global warming. This might make areas with low elevations even more vulnerable to flooding and endanger agriculture.[xvii] Several recent weather occurrences in India that can be attributed to climate change are as follows,

a) A new study has indicated that between 1950 and 2021, the frequency of extreme rainfall events exceeding 15 cm per day increased by twofold over the Meghalaya plateau in the Khasi, Garo, & Jaintia hills and neighboring areas in Assam because of climate change.

b) Meghalaya has historically had heavy rainfall, with two of the wettest locations in the world, Cherrapunji and Mawsynram, being in the state. However, data from the India Meteorological Department shows that throughout the previous 30 years, monsoon rain in the northeast, including Meghalaya, has been going downward.

c) According to a paper that was "published last week in the Journal of Royal Meteorological Society, between May and October of 1950 to 2021, extreme rainfall events quadrupled over northeast Bangladesh& India, western Meghalaya, & coastal southeast Bangladesh compared with the first 30 years between 1950 and 1980.

d) The monsoon flow carries the lower tropospheric moisture transfer as well as flux to inland locations where mountain-forced moisture converges and causes rainfall during severe occurrences, increased by warm sea surface temperatures in the Bay of Bengal. Scientists from the NASA Goddard Space Flight Center, the Department of Marine, Earth, and Atmospheric Science at North Carolina State University, and the Centre for Climate Change Research at the Indian Institute of Tropical Meteorology, among others, conducted an analysis and found that these events exacerbate flash floods and landslides.

e) The greatest 1-day rainfall ever recorded was in June 1995 (1,563.3 mm), whereas Cherapunji in the Meghalaya Plateau recorded the 3rd-highest 1-day rainfall" on June 17, 2022 (972 mm). According to the analysis, in May and June of 2022, there were two instances of extremely high rainfall followed by related flooding over northeast Bangladesh and India.

f) Most of the 9 districts in northeastern Bangladesh were submerged due to the Surma-Kushiyara river basin overflowing as a result of the heavy rainfall. Sunamganj (94% submerged area) and Sylhet (84% submerged area) had the worst and most damaged conditions. According to the report, flash floods in May and June of 2022 caused damage to "244,060 hectares of crops, 40,000 tube wells, and around $28.1 million worth of animals in addition to more than 80 fatalities.[xviii]

Climate Change Litigation in India:

The SC of India has made an effort to address issues related to climate change by interpreting Article 21 of the Constitution broadly. It has been decided that one of the rights guaranteed by Article 21 of the Indian Constitution is the freedom to live a life free from pollution in the air and water.[xix] The SC in the Kedia Leather & Liquor Ltd., case held" that, "Air, water, and environmental pollution are considered violations of the right to life guaranteed by Article 21 of the Constitution. A clean atmosphere is essential to living a healthy existence. In the absence of a sympathetic and healthy atmosphere, the right to live with human dignity becomes unresolved."[xx] Note that, "The SC has given substance to the rights guaranteed to citizens and individuals alike under Article 21 by its numerous rulings to safeguard 'life,' the 'environment,' and 'air, water, and soil' from pollution. When it comes to the enforcement of fundamental rights under Article 21 in the context of public law, the Court has awarded damages in the exercise of its Article 32 powers against those who have disrupted the ecological balance by operating businesses or engaging in other activities that have the potential to pollute the environment. In addition to granting damages, the court upholds the 'Polluter Pays Principle,' which is commonly acknowledged as a way to cover the expense of pollution and control."[xxi]

On April 5, 2024, the Indian Supreme Court acknowledged for the 1st time the right against the negative effects of climate change, stating that it is linked to the rights to equality and life, which are ingrained in the constitution of India. The CJI, DY Chandrachud, led a 3-judge bench that heard arguments on the preservation of the lesser Florican and the big India bustard before rendering a decision.

The appeals court reversed a 2021 decision that, in an effort to save birds, had imposed a general ban on overhead powerlines across 99,000 square kilometers, including portions of Gujarat and Rajasthan. The nation's transition to clean energy, which is essential to achieving its climate goals, will be negatively impacted, according to the court, if underground power transmission lines are only permitted in such a vast region, which also has a great deal of potential for renewable energy sources like wind & solar. This will hamper international efforts to combat climate change and endanger Indians' fundamental rights, including the right to life, equality, and access to energy. This decision is historic because it distinguishes the function of climate mitigation from ecological preservation.

Existing Legal Framework on Climate Change in India:

The National Action Plan on Climate Change was introduced by the government of India in 2008, one of the major actions it has done to address climate change. This strategy outlines a number of strategies for lowering greenhouse gas emissions and enhancing climate impact resistance.

- The NAPCC's core consists of 8 national missions that reflect multifaceted, long-term, integrated strategies for accomplishing important climate change goals. These "are-
  - National Solar Mission
  - National Mission for Enhanced Energy Efficiency
  - National Water Mission
  - National Mission on Sustainable Habitat
  - National Mission for A Green India

- National Mission for Sustaining the Himalayan Ecosystem
- National Mission on Strategic Knowledge for Climate Change
- National Mission for Sustainable Agriculture

▪ NAPCC" is guided by the principles mentioned below -

a) **Protection of the underprivileged and disadvantaged groups in society through a climate change-sensitive, inclusive, and sustainable development plan.**
b) **Successes in achieving national growth through improvements in quality that improve ecological sustainability.**
c) **A broad and quick deployment of suitable technology for the adaptation and mitigation of greenhouse gas emissions.**
d) **Measures, both voluntary and regulatory, to support sustainable growth and create new, creative market forms.**
e) **efficient plan execution through unique connections, such as public-private partnerships with local governments and civic society.**
f) **Encourage international cooperation in the areas of development, research, sharing, and technology transfer, supported by adequate financial resources and a worldwide intellectual property rights framework under the UNFCCC.**

India has addressed "the issue of climate change in a number of ways. The Wild Life (Protection) Act of 1972, the Water (Prevention and Control of Pollution) Act of 1974, the Air (Prevention and Control of Pollution) Act of 1981, the Environment (Protection) Act of 1986, and the National Green Tribunal Act of 2010 are just a few of the acts that the nation's Parliament has passed. The Energy Conservation Act of 2001 was modified in 2022 to give the Central Government the right to create a carbon credit trading" program. In order to guarantee access to and encourage the use of green energy, the Electricity (Promoting Renewable Energy through Green Energy Open Access) Rules 2022 were also adopted under the Electricity Act 2003. The National Solar Mission, the National Mission for a Green India, the National Mission for Enhanced Energy Efficiency, as well as the National Mission on Strategic Knowledge for Climate Change, are only a few of the initiatives that the government's executive branch has carried out.

India has also made commitments to fulfill its NDCs (Nationally Determined Contributions) under the Paris Agreement, which involves decreasing emissions intensity and increasing renewable energy capacity. The nation aims to achieve 175 GW of renewable energy capacity by 2022 and has set high goals for the growth of renewable energy.

In order to meet India's target of net zero emissions by 2070, the Union Cabinet, headed by the PM, approved the revised NDC (Nationally Determined Contribution) on August 3, 2022. This document will be reviewed by the UNFCCC in accordance with the Paris Agreement. This was an interpretation of India's climate change action plan, known as the Panchamrit (five nectar components), which was unveiled during COP 26 in Glasgow, United Kingdom.[xxii]

Despite the progress made, India still faces significant challenges in combating climate change. It is imperative for the country to focus on sustainable development practices that support low-carbon growth and bolster resilience to climate impacts. This entails building the capacity of communities to adjust to changing conditions of climate, investing in green technologies, and advocating for sustainable resource management. By taking decisive action, India can reduce the threats posed by global warming and make sure a sustainable future for its population. The core issue lies in the actual efficiency of the laws, highlighting a disconnect between what is practiced and what is legally mandated. Environmental Law encompasses three key components. Firstly, it involves a statute that is passed by the government. Second, it includes a list of rules that the Environmental Protection Agency has enforced concerning that particular statute. Finally, it describes how our courts have interpreted these regulations legally. It is the absence of political will and enforcement that causes problems in India and compromises the efficacy of this legislation. The government's reluctance to enforce regulations pertaining to air and water pollution, out of concern that it could impede or slow down development initiatives, gives rise to numerous cases of non-compliance. The government feels that the high implementation costs could disadvantage domestic enterprises, which is another connected concern. Consequently, enforcement becomes patchy and even inconsistent.

Even the legal remedies available are not without their own set of problems. Currently, there is no independent regulatory body solely responsible for environmental governance. Instead, the Ministry of Environment, Forest, and Climate Change oversees this aspect, but it often faces excessive interference from the government. To effectively enforce environmental laws, it is essential to address the lack of interdependence between central and state boards, as well as the limited authority these boards possess. Additionally, it is important to encourage courts to overlook technical flaws and misdescriptions. Unfortunately, environmental statutes are more commonly violated than put into practice. This is primarily due to the specialized nature of these laws and the challenges posed by different jurisdictions. The lack of adequate skills,

infrastructure, coordination, and effective implementation further hinders the enforcement of these laws.

Suggestions for Main streaming climate change

To ensure the effectiveness and sustainability of policies, plans, and regulations, it is crucial to incorporate climate risk, mitigation, and adaptation as integral elements. By considering these factors, we can develop robust frameworks that address the difficulties posed by climate change and promote responsible investments and implementation.

1) Climate risk, mitigation, and adaptation must be taken into account in all Central Government laws, regulations, and policies as a fundamental component of policy and plan development, investment, and implementation. 3. 2) The laws mentioned below must be strengthened to mainstream climate change: (i) The Environment (Protection) Act, 1986; (ii) The Air (Prevention and Control of Pollution) Act, 1981; (iii)The Motor Vehicles Act, 1988; (iv) The Indian Forests Act, 1927; (v) The Forest (Conservation) Act, 1980; (vi)The Compensatory Afforestation Fund Act, 2016; (vii) The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; (viii) The Electricity Act 2003; (ix)The Energy Conservation Act, 2001; (x) The Mines and Minerals (Development and Regulation) Act 1957; (xi)Coal Mines (Conservation and Development) Act, 1974; and, (xii) The Disaster Management Act, 2005.

3) The Environment Impact Assessment Notification of 2006 must include a climate risk assessment as a fundamental component.

4) All governmental rules/regulations, as well as policies, should promote 'Ease of doing green business'.

5) The investments as well as purchases that result in the greatest decreases in greenhouse gas emissions over the course of the capital goods or purchased item's lifetime must be prioritized by all laws, rules, and policies.

6) A Climate Advisor will oversee the creation of these cost-efficiency analyses and provide guidance on integrating climate priorities into operations and policy for each government ministry and agency.

7) Climate-related funding for various agencies and ministries must be included in both the union budget of the United States and the state/UT budgets.

Conclusion

India is grappling with the serious issue of global warming, which is exacerbated by the evident threats posed by climate change. Developing nations like India are mainly vulnerable to these challenges. The impact of climate change is widespread, affecting human health through food insecurity, vector-borne diseases, rising sea levels, melting of glaciers, extreme weather events, as well as high temperatures. These changes will have a detrimental effect on agriculture, forests, and coastal areas, and hinder the country's progress towards achieving its national growth objectives. India is known to be the 5th-most vulnerable nation to be affected by climate change (136). India has an ownership stake in seeing a substantial reduction in GHG emissions and in seeing real global efforts to achieve the 1.5°C targets. India will need to lead global climate action in order to achieve this. India's reputation as a climate leader will be greatly enhanced by a framework climate change law that establishes a national framework to solve the climate difficulty.[xxiii]

"The greatest threat to our planet is the belief that someone else will save it."

— Robert Swan

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Education, Public Awareness and Environmental literacy in Promoting Sustainable Development Goals

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Abstract:

This research explores the pivotal role of education, public awareness campaigns, and environmental literacy in advancing sustainable development goals(SDGs) and cultivating a pervasive culture of environmental stewardship. The analysis delves intovarious dimensions of education, including formal education systems, non-formal educational approaches, and informal learning experiences, to identify effective strategies for enhancing environmental literacy and promoting sustainable behaviours across diverse demographic groups and societal contexts.

Keywords: *Education, Public Awareness, Environmental Literacy, Sustainable Development, Environmental Stewardship*

Introduction

Background of Sustainable Development Goals (SDGs): The Sustainable Development Goals (SDGs) have been integrated into India's development agenda as a framework for guiding policies and actions towards sustainable development. India has shown a commitment for achieving the SDGs by aligning them with its national development priorities and strategies.The adoption and integration of SDGs into India's development agenda have taken place:

1. **National Development Plans:** India has incorporated the SDGs into its national development plans, including the Five-Year Plans and the more recent NITI Aayog's 15-year Vision Document, which outlines the country's development trajectory.

National Level Adoption:

2015: India formally adopted the SDGs at the UN Summit.

2017: NITI Aayog established as the nodalagency for SDGs.

2018: SDGIndiaIndex& Dashboard launched to track progress.

2022 The IndianModelofSDGLocalization framework released.

2. **Policy Alignment:** India has aligned its policies and programs with the SDGs across various sectors such as health, education, gender equality, poverty alleviation, clean energy, water, and sanitation. This alignment ensures that national efforts are directed towards achieving the targets set out in the SDGs.
3. **Integration Strategies:**

Alignment with existing schemes: Several flagship schemes like Swachh Bharat Abhiyan and Ayushman Bharat contribute toSDGs.

State-level adoption: Encouraging states to adapt SDGs through State Development Goals and SDG dashboards.

Multi-stakeholder partnerships: Engaging civil society, private sector, and communities in SDG implementation.

Data-driven approach: SDG India Index provides data for informed decision-making.

4. **Data Collection and Monitoring:** India has made efforts to improve data collection, monitoring, and reporting mechanisms to track progress towards the SDGs. This includes the establishment of the NITI Aayog's SDG India Index, which tracks the performance of states and union territories on SDG indicators.

Data Tables:

Table 1: Key SDG Indicators in India (2023)

SDG	Indicator	Target	India's Score	Progress Trend
1 (No Poverty)	Poverty headcount ratio at national poverty line (%)	< 3%	21.9%	Decreasing
2 (Zero Hunger)	Prevalence of stunting in children under-5 years of age (%)	< 35%	34.7%	Decreasing slowly
3 (Good Health & Well-being)	Neonatal mortality rate (per 1,000 live births)	< 10	24	Decreasing slowly
4 (Quality Education)	Net enrolment ratio in secondary education (%)	100%	84.4%	Increasing, but disparities persist
5 (Gender Equality)	Gender parity index (GPI)	1	0.829	Stagnant
10 (Reduced Inequalities)	Gini coefficient	0.30	0.38	Increasing
13 (Climate Action)	CO2 emissions per capita (tonnes)	2.5	2.4	Stagnant

Table 2: SDG India Index Scores (2022-23)

State/UT	Composite Score	National Average
Kerala	70	64.2
Tamil Nadu	66	64.2
Himachal Pradesh	65	64.2
Andhra Pradesh	64	64.2
Karnataka	63	64.2
Maharashtra	59	64.2

5. Multi-Stakeholder Engagement: India recognizes the importance of engaging various stakeholders, including government agencies, civil society organizations, businesses, academia, and citizens, in implementing the SDGs. Multi-stakeholder partnerships are crucial for mobilizing resources, sharing knowledge, and fostering innovation to achieve the goals.

6. Localization and Tailoring: India has localized the SDGs to suit its diverse socio-economic andenvironmental context. States and local governmentsplay a significant role in implementing the SDGs, and efforts are made to tailor strategies to address specific challenges and leverage local resources andexpertise.

7. International Cooperation: India actively participates in international forums and partnerships to exchange best practices, technologies, and resources for achieving the SDGs. This includes collaborations with other countries, international organizations, and the private sector.

8. Inclusive Approach: India's approach to implementing the SDGs is inclusive, aiming to leave no one behind. Efforts are made to address the needs of marginalized and vulnerable populations, including women, children, persons with disabilities, and indigenous communities.

Importance of Education and Public Awareness in Achieving SDGs:

Education and public awareness play critical roles in achieving the Sustainable Development Goals (SDGs) by fostering understanding, mobilizing action, and promoting sustainable behaviours.

Education:

- **Empowerment:** Educated individuals are better equipped to understand complex issuesrelated to poverty, hunger, health, sanitation, climate change, and gender equality.
- **Problem-solving:** Education fosters critical thinking skills, enabling individuals to identify and address local and global challenges related to achieving the SDGs.
- **Behaviour change:** Education promotes informed decision-making and encourages behaviour changes necessary for sustainable development, like responsible resource consumption and healthy practices.
- **Civic engagement:** Educated citizens are more likely to participate in democratic processes and hold authorities accountable for SDG implementation.

Public Awareness:

- **Sensitization:** Public awareness campaigns raise awareness about the SDGs and their importance, fostering a sense of shared responsibility and collective action.

- **Community mobilization:** Awareness campaigns can mobilize communities to participate in initiatives like waste management, water conservation, and sustainable agriculture.
- **Demand for change:** Increased awareness can generate demand for government accountability and action towards achieving the SDGs.
- **Behaviour change:** Similar to education, public awareness campaigns can inform and encourage individuals to adopt sustainable practices in their
- daily lives.

Here are explained several reasons why they are important:

1. Empowering Communities: Education empowers individuals and communities with the knowledge, skills, and capacities necessary to understand the importance of sustainable development and actively participate in achieving the SDGs. It enables people to make informed decisions about their lives, livelihoods, and the environment.

2. Behavioural Change: Public awareness campaigns can influence attitudes, values, and behaviors towards more sustainable practices. By raising awareness about the interconnectedness of social, economic, and environmental issues, individuals are encouraged to adopt sustainable lifestyles, such as reducing consumption, conserving resources, and recycling.

3. Building Partnerships: Education and public awareness initiatives facilitate multi-stakeholder partnerships and collaborations between governments, civil society, academia, businesses, and communities. These partnerships are essential for mobilizing resources, sharing knowledge, and implementing effective strategies to achieve the SDGs.

4. Advocacy and Policy Influence: Educated and informed citizens are better equipped to advocate for policy changes and hold governments and institutions accountable for their commitments to sustainable development. Public awareness campaigns can raise visibility and generate support for SDG-related policies, programs, and initiatives.

5. Promoting Gender Equality and Social Inclusion: Education plays a crucial role in promoting gender equality and social inclusion, which are fundamental principles of the SDGs. By ensuring equal access to quality education for all, regardless of gender, ethnicity, socio-economic status, or disability, societies can empower marginalized groups and reduce inequalities.

6. Building Resilience to Global Challenges: Education and public awareness are essential for building resilience to global challenges such as climate change, biodiversity loss, natural disasters, and pandemics. By educating people about the impacts of these challenges and promoting adaptive strategies, communities can better prepare for and respond to crises.

7. Long-term Sustainability: Education fosters a culture of lifelong learning and innovation, which are essential for achieving long-term sustainability. By investing in education and public awareness, societies can build the human capital and knowledge base needed to address current and future development challenges effectively.

Data showcasing the impact:

Table 1: Correlation between Education Levels and SDG Indicators in India:

SDG	Indicator	Higher Education Level Correlation
1 (No Poverty)	Poverty headcount ratio	Negative correlation (higher education leads to lower poverty)
2 (Zero Hunger)	Child stunting prevalence	Negative correlation (higher education leads to lower stunting)
3 (Good Health & Well-being)	Maternal mortality ratio	Negative correlation (higher education leads to lower maternal mortality)
4 (Quality Education)	Secondary education enrolment ratio	Positive correlation (higher education levels lead to higher enrolment)
5 (Gender Equality)	Gender parity index	Positive correlation (higher education levels lead to improved gender equality)

Table 2: Impact of Public Awareness Campaignsin India:

Campaign	SDG Focus	Impact
Swachh Bharat Abhiyan (Clean India Mission)	SDG 6 (Clean Water and Sanitation)	Increased public awareness and participation in sanitation initiatives, leading to a rise in toilet usage and waste management.
Beti Bachao Beti Padhao (Save the Girl, Educate the Girl)	SDG 5 (Gender Equality)	Increased awareness about gender equality and the importance of educating girls, leading to a rise in female enrolment in schools.
National Nutrition Mission	SDG 2 (Zero Hunger)	Increased awareness about nutrition and healthy eating habits, contributing to a reduction in malnutrition rates.

The Role of Education in Sustainable Development:

Definition of Education for Sustainable Development (ESD):

Education for Sustainable Development (ESD) aims to empower individuals and communities to make informed decisions and take responsible actions for a more sustainable future.

- **Knowledge:**Understanding the interconnectedness of environmental, social, and economic issues.
- **Skills:** Critical thinking, problem- solving, decision-making, communication, and collaboration.
- **Values:** Respect for diversity, equity, social justice, and environmental responsibility.
- **Action:** Participation in initiatives and projects that contribute to sustainable development.

Integration of ESD into Formal Education Systems:

The integration of Education for Sustainable Development (ESD) into formal education systems in India is crucial for fostering a culture of sustainability among students and educators.

Here's in the detail how ESD can be integrated into formal education systems:

1. Curriculum Development: ESD can be integrated into the national curriculum framework and syllabi across all levels of education, including primary, secondary, and higher education. This involves revising existing curricula to incorporate sustainability concepts, themes, and values into various subjects such as science, social studies, geography, economics, and environmental studies.

2. Teacher Training and Professional Development: Providing pre-service and in-service training to teachers on ESD pedagogy and methodologies is essential. Teachers need to be equipped with the knowledge, skills, and resources to effectively integrate sustainability into their teaching practices and classroom activities.

3. Teaching and Learning Materials: Developing and disseminating ESD teaching and learning materials, including textbooks, teaching guides, lesson plans, multimedia resources, and interactive tools, can support educators in delivering engaging and informative sustainability education content.

4. Experiential Learning and Project-Based Activities: Incorporating experiential learning and project-based activities related to sustainability issues can enhance student engagement and understanding. Field trips, case studies, group projects, community-based initiatives, and hands-on activities allow students to explore real-world sustainability challenges and develop practical solutions.

5. Cross-Curricular Integration: Encouraging interdisciplinary approaches to teaching and learning can facilitate the integration of sustainability across different subject areas. Teachers can collaborate across disciplines to explore connections between social, economic, environmental, and cultural dimensions of sustainability.

6. Assessment and Evaluation: Developing assessment methods and tools to evaluate students' knowledge, skills, and attitudes towards sustainability is essential. Assessments should go beyond traditional testing methods and include performance-based assessments, portfolios, projects, and reflective exercises that measure students' ability to apply sustainability concepts in real-life contexts.

7. School Leadership and Governance: Promoting leadership and governance structures within schoolsthat prioritize sustainability can create an enabling environment for ESD implementation. School administrators, principals, and management bodies can support and encourage teachers to integrate sustainability into their teaching practices and schooloperations.

8. Partnerships and Collaboration: Establishing partnerships and collaboration between educational institutions, government agencies, non-governmental organizations, businesses, and community stakeholders can enhance the effectiveness of ESD implementation. These partnerships can provide resources, expertise, and support for ESD initiatives and create opportunities for experiential learning and community engagement.

Examples:

- **National Green Tribunal mandate:** In 2018, the NGT mandated ESD integrationinto school curricula across India.
- **Ek Bharat Shreshtha Bharat:** This flagship program promotes cultural exchange and understanding between states, incorporating sustainable practiceslike waste management and water conservation.
- **Green Schools Program:** This initiative incentivizes schools to adopt sustainable practices and raise awareness about environmental issues.

Public Awareness Campaigns for Environmental Conservation

Understanding the Significance of Public Awareness:

Public awareness campaigns for environmental conservation are crucial for fostering a widespread understanding of the importance of protecting and preserving the environment.

These campaigns play a vital role in engaging and mobilizing individuals, communities, and societies to take collective action towards sustainable practices and behaviors. Here's why public awareness is significant in environmental conservation:

1. Knowledge Dissemination: Public awareness campaigns provide information and raise awareness about environmental issues, including climate change, biodiversity loss, pollution, deforestation, and resource depletion. By disseminating scientific knowledge and facts, these campaigns help people understand the causes, consequences, and solutions to environmental challenges.

2. Behaviour Change: Public awareness campaigns aim to influence attitudes, values, and behaviours towards more sustainable practices. By highlightingthe impacts of individual and collective actions on the environment, these campaigns encourage people to adopt eco-friendly behaviours such as reducing waste, conserving energy, using public transportation, recycling, and supporting sustainableproducts and businesses.

3. Empowerment and Engagement: Public awareness campaigns empower individuals to become active participants in environmental conservation efforts. By providing information, resources, and tools for action, these campaigns enable people to make informed choices and take meaningful steps towards protecting and preserving the environment. They also encourage civic engagement, volunteerism, and community involvement in environmental initiatives.

4. Policy Support: Public awareness campaigns can generate public support for environmental policies, regulations, and initiatives. By raising awareness about the importance of environmental conservation, these campaigns create a demand for government action and encourage policymakers to prioritize sustainability in decision-making processes. Public pressure and advocacy efforts stemming from awareness campaigns can drive policy changes that promote environmental protection and sustainability.

5. Crisis Preparedness and Resilience: Public awareness campaigns help communities prepare for and respond to environmental crises and disasters, such as natural hazards, extreme weather events, and environmental emergencies. By educating people about potential risks and vulnerabilities, these campaigns empower them to take preventive measures, develop resilience strategies, and adapt to changing environmental conditions.

6. Social Norms and Cultural Shifts: Public awareness campaigns can influence social norms and cultural attitudes towards the environment. By promoting environmental values, ethics, and norms of behavior, these campaigns contribute to a cultural shift towards sustainability, where caring for the environment becomes ingrained in societal norms and practices.

7. Leveraging Media and Communication: Public awareness campaigns utilize various communication channels and platforms, including traditional media, social media, digital technologies, public events, educational programs, and community outreach initiatives, to reach diverse audiences and amplify their messages. Effective communication strategies can enhance the reach, impact, and effectiveness of environmental conservation efforts.

Case Studie sofSuccessful Environmental AwarenessCampaigns:

India faces various environmental challenges, making effective awareness campaigns crucial. Here are some successful examples with associated data:

Case Study 1: Swachh Bharat Abhiyan (CleanIndia Mission)

- **Launched:** 2014
- **Goal:** Eradicate open defecation andimprove sanitation across India.
- **Strategies:**
  - Community mobilization throughSwachh Bharat Ambassadors andSwachhagrahis.
  - Construction of toilets in rural areasand public

spaces.
- Behavior change communicationcampaigns.
- Open defecation reduced from 59%to 6% (2014-2020).

Data:

- **Impact:**
- Over 110 million toilets built in ruralareas.
- Increased awareness about sanitationand hygiene.

Indicator	2014	2020	Change
Open defecation prevalence (%)	59	6	-93%
Rural sanitation coverage (%)	39	108	+69%
Number of toilets built in rural areas (million)	0	111	+111

Case Study 2: Paryavaran Samrakshak (Environmental Protector)

- **Launched:** 2019
- **Goal:** Enhance public participation in environmental protection.
- **Strategies:**
- Mobile app enabling citizens to report environmental violations.
- Training and engagement programs for volunteers.
- Awareness campaigns focusing on specific issues like waste management and air pollution.
- **Impact:**
- Over 2 million app downloads and reported violations.
- Increased volunteering and community action for environmentalprotection.
- Improved government responsiveness to environmentalconcerns.

Data:

Indicator	Launch (2019)	2023	Change
App downloads (million)	0	2.2	+2.2
Reported environmental violations (thousand)	0	500	+500
Number of trained volunteers (thousand)	0	50	+50

Case Study 3: Project Tiger

- **Launched:** 1973
- **Goal:** Protect endangered tiger populations in India.
- **Strategies:**
- **Establishing and managing tigerreserves.**
- Anti-poaching measures andpatrolling.
- Community engagement and awareness campaigns.
- .
- Habitat restoration and conservationefforts.
- **Impact:**
- Wild tiger population in India increased from 1,899 in 2010 to3,000 in 2022.
- Improved habitat protection and reduced poaching threats.
- Increased public awareness andsupport for tiger conservation

Data:

Indicator	2010	2022	Change
Wild tiger population in India	1,899	3,000	+58%
Number of tiger reserves	47	50	+3
Anti-poaching arrests per year (average)	100	60	-40%

Challenges and Opportunities in Implementing Public Awareness Initiatives:

Public awareness initiatives play a crucial role in influencing public opinion, behaviour change, and

policy advocacy. However, implementing successful campaigns isn't without its challenges. Here's a breakdown of both sides:

Challenges:

- **Competing messages:** The information landscape is saturated, making it difficult for campaigns to stand out and capture attention.
- **Misinformation and disinformation:** Countering the spread of inaccurate information can be challenging, especially with online echo chambers.
- **Reaching target audiences:** Effectively reaching specific demographics and tailoring messages to their needs can be complex.
- **Engaging diverse populations:** Cultural sensitivity and language barriers can pose challenges in inclusive messaging.
- **Limited resources:** Budget constraints canlimit the reach and impact of campaigns.
- **Measuring effectiveness:** Evaluating the true impact of awareness initiatives can be difficult due to multiple influencing factors.
- **Sustaining engagement:** Maintaining public interest and momentum over longer periods can be challenging.

Opportunities:

- **Leveraging technology:** Utilizing social media, digital tools, and data analytics can enhance reach, targeting, and impact measurement.
- **Collaboration and partnerships:** Partnering with relevant stakeholders, including community organizations and influencers, can amplifyreach and credibility.
- **Storytelling and emotional connection:** Crafting compelling narratives and using emotional appeals can build deeper engagement.
- **Interactive and personalized approaches:** Allowing for audience participation and tailoring messages to individual needs can increase effectiveness.
- **Focus on action and empowerment:** Providing clear calls to action and supporting behavior change can drive tangible results.
- **Transparency and accountability:** Ensuring transparency in funding sources and project outcomes can build trust and support.
- **Long-term planning and evaluation:** Implementing campaigns within a broader strategy and continuously evaluating their impact can lead to sustained success.

Environmental Literacy: Key to Sustainable behaviour

Conceptual Framework of Environmental Literacy:

Environmental literacy is indeed a crucial component of fostering sustainable behaviour and promoting stewardship of the environment.

1. Knowledge and Understanding: Environmental literacy begins with acquiring knowledge and understanding of ecological concepts, environmental systems, and sustainability principles. This includes understanding the interconnections between human activities and the natural world, as well as the impacts of environmental degradation on ecosystems, biodiversity, and human well-being.

2. Values and Ethics: Environmental literacy is underpinned by values and ethics that prioritize environmental stewardship, social responsibility, and intergenerational equity. It involves cultivating a deep appreciation for nature, biodiversity, and cultural heritage, as well as a sense of responsibility towards future generations and the planet.

3. Sense of Place and Connection to Nature: Environmental literacy encompasses a sense of place and connection to nature, rooted in an understanding of local ecosystems, landscapes, and cultural contexts.

4. Lifelong Learning and Adaptation: Environmental literacy is a lifelong learning process that requires ongoing education, curiosity, and adaptation to changing environmental conditions and societal needs. It involves seeking out new knowledge, staying informed about emerging environmental issues, and continuously updating skills and perspectives.

5. Sustainability Literacy: Environmental literacy is closely linked to sustainability literacy, which encompasses understanding the principles of sustainable development, including social equity, economic viability, and environmental integrity. It involves recognizing the need for transformative changes towards more sustainable lifestyles, economies, and societies.

Conclusion:

This research underscores the critical role of education, public awareness campaigns, and environmental literacy in advancing sustainable development goals (SDGs) and fostering a culture of environmental stewardship. Through an analysis of India's integration of the SDGs into its development agenda and the importance of education and public awareness in achieving these goals, key findings emerge.

Recommendations for Future Action:

To further advance sustainable development goals and environmental stewardship, it is recommended that:

1. Education systems prioritize the integration of

Education for Sustainable Development (ESD) across formal curricula and teacher training programs, emphasizing experiential learning, cross-curricular integration, and community engagement.

2. Public awareness campaigns leverage technology, storytelling, and partnerships to reach target audiences effectively, focusing on actionable steps and long-term behavior change.

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Navigating the Waters: Understanding the Maharashtra Groundwater (Development and Management) Act, 2009

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No matter how brilliant the technological revolutions, no matter how useful the economic and political initiatives, there can only be hope if man can cast away his anthropocentric delusions and seek to find his place in nature, a place from which he can live in harmony with his universe.

- Sir James Goldsmith[i]

Human beings, as stewards of the Earth, bear a profound social responsibility to conserve nature for the well-being of current and future generations. This responsibility stems from the recognition that our actions have far-reaching consequences, not only for ourselves but for the entire ecosystem.

Groundwater conservation is vital for environmental protection and sustainable development, supporting ecosystems, agriculture, and water security. Political will and legal frameworks are crucial for translating intentions into action, regulating extraction, and fostering environmental stewardship. Together, they form the foundation for effective environmental protection and resource management, ensuring a sustainable future for all.

The Maharashtra Groundwater (Development and Management) Act, 2009 is a legal initiative which stands as a pivotal piece of legislation, reflecting the state's commitment to sustainable water resource management. Enacted to address the challenges posed by over-exploitation and deterioration of groundwater quality, the Act aims to strike a balance between meeting water needs and ensuring environmental protection.

Backdrop of the 2009 Act

The groundwater levels in Maharashtra are heavily influenced by a unique blend of factors such as topography, climate, soil, and rock formations. Approximately one-third of the state, falling within the rain-shadow zone of the Western Ghats, is semi-arid and thus susceptible to groundwater stress. This region includes Dhule, Jalgaon, Nasik, Ahmednagar, Pune, Beed, Osmanabad, Latur, and Solapur districts, where annual rainfall ranges between 400 and 750 mm. However, due to the rocky terrain and low porosity of the Deccan trap formation covering about four-fifths of the state, groundwater recharge is limited, leading to poor underground water storage. Exceptions to this pattern are found in alluvial patches in eastern parts and northern basins like Wainganga, Wardha, and Tapti, particularly in the Vidarbha region, where better rainfall and surface water availability are observed.

Historically, the Marathwada region has faced drinking water challenges dating back to Sant Dnaneswar's time in the thirteenth century. These challenges persisted through British times and spurred the development of irrigation infrastructure in Western Maharashtra. Post-independence, the adoption of commercial crops and improved farm electrification led to a rapid increase in groundwater exploitation for agriculture.[ii] Modern drilling technology introduced in Maharashtra in 1972, facilitated the construction of deep bore wells, primarily by commercial farmers, resulting in excessive groundwater exploitation, especially in water-scarce regions. This exploitation, however, disproportionately benefitted those with financial means or access to credit, exacerbating rural water scarcity.[iii]

The state government established the Ground Water Survey and Development Agency (GSDA) in 1971 to assess groundwater availability systematically. However, subsequent assessments consistently highlighted over-exploitation of groundwater. Meanwhile, around the same time, scarcity of drinking water was among the most burning topics across the country due to the adverse impact of successive bouts of severe draughts, especially on the groundwater-rich areas. Consequently, the then Central Government, through its Central Water Policy, ranked addressing the issue of shortage of drinking water across the country on the top of its primacies although drinking water and ground water fall within the ambit of the State List under Schedule II of the Indian Constitution. An effort was made to give effect to this policy by devising a model bill aimed at regulating the development of ground water and the state governments were expected to legislate accordingly for their respective jurisdictions bearing in mind their specific regional conditions and needs. The state of Maharashtra was one of the only few states in the country back then to respond suitably

and enact a legislation in this regard known as *Maharashtra Ground Water (Regulation for Drinking Water Purposes) Act, 1993* (1993 Act).[iv]

The 1993 Act, along with the subsequently framed rules, commenced the state-wide operation of regulating the exploitation of ground water for the protection of public drinking water sources. Inter alia, it had provisions for regulating watershed overexploitation and prohibiting construction of new wells and/or other ground water intensive actions, especially in areas prone to abusive extraction and over-utilization of ground water.[v] Meanwhile, the 2nd Maharashtra Water and Irrigation Commission was constituted in December 1995, headed by Dr. Madhavrao Chitale. Under his chairmanship, the high-level, 12-man, multi-disciplinary commission, presented a comprehensive and voluminous report in 1999 which analysed the water conditions, from a water and irrigation perspective, in 25 sub-basins of the state's major river-basins and prescribed suitable action plans.[vi] This report introduced the notion of accounting for the total usage of ground water across all the various purposes of its usage and recommended the allocation of the ground water at the easily renewable levels for drinking and other purposes and that from deeper ground levels for irrigation. Simultaneously, GSDA had been conducting pilot studies in the districts of Jalna, Beed, and Satara, wherein the aquifer's limitations were studied and awareness was spread across the local population on the disproportion between supply and demand of water, the need for an action plan to manage groundwater usage and how to devise it and measures for water conservation, basis the available data on water levels. GSDA's efforts helped the villagers consume water judiciously, perform crop-planning efficiently and avoid planting cash crops, thereby, leading to a significant drop in their water-dependency, especially during times of inadequate rainfall.[vii] Subsequently, the GSDA, in collaboration with the Government of India's Central Ground Water Board (CGWB), Nagpur, prepared the Report on Dynamic Ground Water Resources of Maharashtra (2011-12) which revealed that majority (over 90%) of the total abstracted groundwater in the state was solely for irrigation whereas drinking water and industrial purposes held only a very minor stake (under 5% and 2-3% respectively).[viii]

The state government's learnings from GSDA's pilot studies coupled with findings from other surveys alongside the CGWB conducted in the state over the years brought forth the following drawbacks of the 1993 Act to light:

(a) The 1993 Act had been looking at ground water only from the perspective of drinking water while the actual issue was found to be at the stage of extraction of ground water. The needs of water for drinking and irrigation could not be seen differently anymore and, hence, there was a need for looking at it from the perspective of usage of groundwater as a whole;
(b) For making groundwater sustainable, abstraction needs to be controlled. Therefore, mandating a robust groundwater management plan and crop plan was required; and
(c) The 1993 Act was missing provisions that touched upon important issues such as quantum of water that can be extracted at any given time for irrigation, plantation of water-intensive crops, especially in areas prone to water-shortage and drilling of deep borewells for the purposes of irrigation.[ix]

Thereafter, the state government decided to strengthen the law on groundwater conservation and management in the state by improvising upon the 1993 Act and introducing the Maharashtra Groundwater (Development & Management) Bill, 2009, which went on to become the Maharashtra Groundwater (Development & Management) Act, 2009 (2009 Act).

Salient Features of the 2009 Act

The Bill version of the 2009 Act, which was then prepared by the government's Water Supply and Sanitation Department, was pondered upon in detail with the relevant stakeholders, subject-matter specialists, and various government organizations and officials over several regional and state level workshops. The Joint Select Legislative Committee of the Maharashtra Legislative Assembly/Council took it under its consideration and, post multiple discussions followed by a field visit to the state of Rajasthan, the bill was unanimously passed in the State Legislative Assembly and Council in April, 2012 budget session. The bill got presidential assent in November, 2013, following which, the 2009 Act got published in the Maharashtra Government Gazette in December, 2013.[x] The Act comprises of eight chapters and 59 sections.

(1) Purpose

The Long Title of the 2009 Act reveals that it aims to facilitate and ensure the following:

(a) sustainable, equitable and adequate supply of groundwater of prescribed quality, for various category of users through supply and demand management measures;
(b) protection of public drinking water sources;
(c) establishment of the State Groundwater Authority and District Level Authorities to manage and regulate, with community participation, the exploitation of ground water within Maharashtra; and
(d) other connected and incidental matters.

(2) Important Provisions

(a)Definition of Groundwater (S. 2(1)(xi))

The Act defines "groundwater" as the *water existing in an aquifer below the surface of the ground in the zone of saturation which can be extracted through wells, borewells, tubewells or any other means or emerges as springs and base flow in streams and rivers.*

(b) Repealing the 1993 Act (S. 59)

With the advent of the 2009 Act the 1993 Act has been hereby repealed and thereby rendered inactive.

(c) Authorities under the 2009 Act

Following are the Authorities established under in this Act:

I. State Authority (Ss. 3-14)

The Maharashtra Water Resources Regulatory Authority (hereinafter referred to as "The State Authority") established under section 3 of the Maharashtra Water Resources Regulatory Authority Act, 2005 (hereinafter referred to as "Water Resources Act") has been named as the State Ground Water Authority for the purposes of this Act. The Authority shall invite, in addition to its five special invitees under the Water Resources Act, the Director, GSDA, an expert from the field of groundwater and a female representative of the groundwater users as may be specified by the Government for assistance in taking policy decisions. It has been granted the following powers and duties under this Act, which it shall exercise in consultation with its invitees, and other governmental and local bodies:

(i) Power to notify areas to regulate development and management of ground water therein by notification in the Official Gazette and to de-notify areas when the quality and quantity of groundwater therein has improved to the desired levels;

(ii) Power to protect and preserve the quality of groundwater, all existing drinking water sources, and recharge-worthy areas in notified and non-notified areas in the State including preventing persons, including rural/urban local bodies, from polluting the quality of groundwater sources and taking necessary measures to restore the quality of water to the required standards at the cost of the polluter;

(iii) Duty to register all well-owners and monitor the compulsory registration of drilling rig-owners and operators in the State;

(iv) Power to prohibit and regulate, including total ban on, drilling of deep-wells in the notified and non-notified areas of the state for agricultural, industrial and/or any other purpose;

(v) Power to direct the District Authority established under this Act to prohibit the pumping of groundwater out of existing deep-wells in notified areas and other connected directions;

(vi) Duty to identify recharge-worthy areas in the State in consultation with GSDA and CGWB and issue appropriate guidelines for rainwater harvesting to recharge groundwater, and, in this regard, the power to direct concerned local bodies appropriately

(vii) Duty to ensure implementation of groundwater-conservation measures through encouraging community participation, issuing guidelines to discourage planting water-intensive crops, encouraging best practices, ensuring construction of appropriate rainwater harvesting structures and promoting training and awareness programmes;

(viii) Power to assist the State Government and local bodies in devising appropriate groundwater use and crop plans for concerned stakeholders and connected measures and duty to issue appropriate guidelines in that regard;

(ix) Duty to issue guidelines on precautionary measures for ensuring safety of wells; and

(x) Power to delegate its powers and duties to other governmental authorities;

II. State Water Board, State Watershed Management Council and State Water Council (Ss. 15-16)

The State Water Board constituted under the Water Resources Act is the empowered committee under this Act which is responsible for integrating the Integrated Watershed Development and Management Plan for the entire State and submitting it to the State Watershed Management Council. The State Watershed Management Council, whose responsibility may be assigned to the State Water Council by the State Government by notification in the Official Gazette, must approve the said plan along with the State Water Council and these two Councils must ensure its integration with the State Water Plan.

III. District Authority and District Watershed Management Committee (Ss. 17-24)

The State Government may designate any officer, not below the rank of Tahsildar as the District Authority and constitute a District Committee for Watershed Management consisting of the Guardian Minister for the District as the chairperson, one member of the State Legislature from the concerned area, other members as may be nominated by the State Government and the Collector as its Member-Secretary.

The District Committee prepares the Integrated Watershed Development and Management Plan for

artificial recharge of groundwater for notified and non-notified areas in consultation with GSDA and other governmental bodies. The District Authority carries out the following functions:

(i) Implements the decisions of the District Committee and the Watershed Water Resources Committee;

(ii) Notifies, by order, public drinking water sources and the area of influence around such source following which no person can sink a well within 500 meters from such source and in such area of influence, except when such well is sunk on behalf of the State Government or a local body to be used as a public drinking water source. Wells that are sunk contrary to such order of the District Authority can be closed or confiscated by the District Authority;

(iii) Prohibits the extraction of water from an existing well within an area of influence for a reasonable period, if it is found to have an adverse impact on a Public Drinking Water Source and having regard for the quantum and pattern of rainfall and other relevant factors, in consultation with the GSDA and other governmental bodies and after giving reasonable hearing to the owner of such well;

(iv) Prohibits and regulates the extraction of groundwater in villages and preserves the quality of the water in the concerned drinking water sources, especially during times of water scarcity. In this regard, it takes the assistance of the concerned Panchayat;

IV. Watershed Water Resources Committee (Ss. 29-37)

The State Authority shall establish a Watershed Water Resources Committee for areas with over 11 villages, chaired by the Panchayat Samiti's Chairman. Members include representatives from local bodies, government departments, Water Users' Associations, elected officials, NGOs, and the Block Development Officer as secretary. The committee, with at least one-third female members, meets quarterly and in emergency situations, led by the Tahsildar. If the area has fewer than 11 villages, the Panchayat/Urban Local Body will handle the Committee's functions.

Following are the functions of this Committee:

(i) Preparing a watershed/aquifer-based groundwater use plan with the GSDA's technical support and updating the same every year based on rainfall and groundwater-levels of a hydrological year;

(ii) Monitoring groundwater extraction, safeguarding sustainability of public drinking water sources and making relevant recommendations to the State Government and local bodies;

(iii) Ascertaining the existing groundwater-users and well-owners and implementing individual measures for artificial groundwater recharge;

(iv) Specifying cropping pattern for the concerned area considering the water budget and plan for groundwater extraction from existing wells for domestic, agricultural, industrial, and other uses;

(v) Regulating/prohibiting sand-mining in a notified area;

(vi) Prohibiting/limiting/regulating the use of chemical fertilizers/pesticides and disposal/burial/injection of waste and industrial effluents for protecting the groundwater quality;

(vii) Regulating the construction of new wells in the concerned area;

(viii) Ensuring community participation and ownership of groundwater, protection of small and marginal farmers' rights, restricting groundwater surveys and extraction; and

(ix) Publishing reports and submitting them to the Gram Sabha and other local bodies.

V. GSDA (Ss. 41-46)The GSDA's functions under this Act are as under:

(i) Identifying, delineating, and declaring basic watershed/aquifer and public drinking water sources' area of influence in the State along with boundaries;

(ii) Assisting Watershed Water Resources Committee & Panchayat in the preparation of watershed/aquifer-based groundwater use plan and the District Watershed Management Committee in the preparation of Integrated Watershed Development and Management Plan for artificial groundwater recharge;

(iii) Carrying out necessary hydro-geological studies and supporting the work of state and local bodies; and

(iv) Rendering technical advice on monitoring and encouraging individual measures for artificial groundwater recharge, protecting watershed status of a given area and permitting the drilling of wells up to 60 meters in non-notified areas;

(d) Water Scarcity Measures (Ss. 25-28)

Water scarcity can be declared for up to one hydrological year in a watershed area by local authorities, considering factors like rainfall and groundwater data, and population needs. During such periods, regulations may be imposed on groundwater extraction, including temporary well

bans and inquiries, with violators subject to compensation and enforcement actions such as surveys, tests, and demolitions by the District Authority.

(e) Prohibition of sale of groundwater (Section 8(5))

The sale of groundwater in notified areas by any person/groundwater user without obtaining the prior permission of the District Authority is prohibited under this Act.

(f) Offences, Penalties and Procedures (Ss. 52-56)

Offences under this Act include contravention of its provisions or obstruction of Authorities, punishable by fines up to ₹10,000 for the first offence and imprisonment or higher fines for subsequent offences. In cases involving companies, individuals in charge may be held liable unless they prove lack of knowledge or due diligence, while directors and officers can also be punished if they consented or neglected the offence.

Prosecution for offences under this Act requires the District Authority's consent and can be instituted before a court not below Metropolitan Magistrate/Judicial Magistrate First-Class. Offences can be settled by the District Authority upon payment of a sum not exceeding the maximum penalty. Individuals aggrieved by decisions of various bodies may appeal to the District Authority within 60 days, with further appeal to the State Authority within 60 days of the District Authority's decision. The State Authority's decision shall be final.

Scope for Improvement

Following are certain areas wherein there is scope for improvement vis-à-vis the efficiency of the 2009 Act:

(a) No rules have been notified till date. In the absence of rules, it is difficult to judge how the provisions of the Act would be interpreted and practically applied, thereby, rendering it problematic to apply and enforce its broad visions and objectives in accordance with regional needs and conditions. The State is also missing out on the opportunity to learn from the experiences of implementing the law and thereby letting it evolve and adjust to suit its needs better. As per the latest official update, the draft rules, that were framed in 2018, are still at the stage of receiving comments and suggestions from concerned stakeholders[xi];

(b) The restrictions placed on planting water-intensive crops have not been received well among the farming community as they apparently have expressed that there are better ways to curb the growth of such crops, such as, a pricing mechanism that incentivizes farmers to abstain from growing such crops in water-scarce areas[xii]. There has also been a resistance from water-tanker lobby, the soft-drinks and alcohol industries and other pressure-groups whose commercial interests revolve around water-intensive crops such as sugarcane[xiii];

(c) While this Act does not allow for digging a well deeper than 60 meters, it has been observed that drilling deeper than 500 and, in some cases, 800 meters is quite common in certain draught-prone areas of the State[xiv]. How this Act will regulate such patterns of behaviour remains to be seen;

Conclusion

Illegal extraction of groundwater is not only an offence under the present Act of 2009 but also has been noted as an offence under the Environment Protection Act, 1986 by courts and prompt coercive measures, including recovering compensation, against use of unauthorized tubewells, etc. have been noted time and again.[xv] Recently, the National Green Tribunal went on to direct the disconnection of electricity supply for illegal borewells being used for unauthorized extraction of groundwater, noted the urgent need for action and an efficient mechanism against unauthorized operators and tanker mafias and also safeguarded the complainant/litigant from being victimized/influence by the authorities[xvi]. With the rules for the 2009 Act not yet in place, the Act along with its ambitions for the State are still in limbo and in urban and semi-urban areas such as Mumbai, which have remained largely un-surveyed, groundwater extractors are operating lawlessly. Hence, a swift action in the form of implementing appropriate rules under the Act is required from the Government of Maharash

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Essentiality of Clean Environment for Right to life: Judicial Activism

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Abstract

Without a clean environment, life has no meaning. The Constitution of India, though guarantees the right to life in Article 21 but the necessary requirements to enjoy right to life have not been guaranteed rather reflects directly in the Constitution. Therefore, the judiciary had to come to the support of the meaningful meaning to the term 'life' through their judicial verdict and judgments. The Constitutional courts, i.e. Supreme Court and High Courts have declared the necessary components of life through their various judgments and thereby posted the clear picture and vision to the term 'life'. The Supreme Court has not only defined life but given true meaning and clear understanding of it. Right to life becomes possible with right to education, right to shelter, right to health and so as right to have a clean environment. Providing a clean environment to its citizens therefore declared the duty of the State and ultimately the right of the citizen. Every element of nature therefore, directed to be preserved, protected and propagated. The Constitution of India through different articles provided the concerned with the environment. Article 48A states "The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country." Article 51A(g), it is the duty of every citizen to preserve and protect the environment. It states "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers, and wildlife and to have compassion for living creatures." Shriram Fertilizer case, Indian Council for Enviro-Legal Action v. Union of India M. C Mehta v. Kamal Nath, Vellore citizens welfare forum v. Union of India are few of the many cases where the judiciary has shown its seriousness about the relationship between the right to life and clean environment.

When nature had gifted the environment to its living creatures and living beings, it was very clean, pure and beautiful. Nature knew that human society would damage the environment for their selfish goals and for unnecessary reasons. May be this was the reason for nature to create certain dangerous creatures to protect the environment from human society. In the last century, we have seen tremendous damage to the environment in the name of development, progress etc. No one is here to oppose the development and progress of the society. But this development and progress shall be made in accordance with the rule of nature and so as law. Law relating to development should be made in accordance with the rule of nature. For whom we need development? Human society? What if human society is not able to enjoy the development due to the threat to the environment. How can we ignore the human right and fundamental right of person enshrined in UDHR and Constitution of India.In Chameli Singh v. State of U. P[i]the court said that "right to live in any civilised society implies the right to food, water, decent environment, education, medical care and shelter. These are basic human rights known to any civilised society. All civil, political, social and cultural rights enshrined in the Universal Declaration ofHuman Rights, 1948 or the ones guaranteed under the Constitution of India cannot be exercised without these basic human rights."

This article is trying to focus on the issue that without a clean environment, the right to life has no meaning and hence if we really wish to respect our right to life, we have to perform our duty towards keeping the environment clean. The Supreme Court of India through its judicial inventiveness has provided the right to live in a contamination clean environment. Article 21 of the Constitution of India does provide progress and development places human society at the middle of development casting a commitment on the state to guarantee the benefits of advancement to all its citizens. Article 21 could co-establish the relation and Interest of both the right to the environment and the right to development.

Today, we are debating about the right to life and the need for development. Many times, we claim life and development standing opposite to each other. This argument carries weightage only if development is carried out without keeping the environment intact or by causing irreparable damage to the environment. But thinking otherwise life and development are two sides of same coin if we keep the development on for the human being and all

living beings and by maintaining the law of nature at highest priority.

It is to be noted that the Indian judiciary has read the right to life and right to development with care of the environment under Article 21 of the Constitution of India. Right to a healthy and clean environment guarantees a societal interest which is enshrined in the Directive principles of State Policy under the Constitution of India. This article is talking about the important heads of the environment, such as *Jal, Jammen & Jungle*(Water, Land & Forest) and impact of its damage on right to life with the help of judicial activism.

In 1972 United Nations Conference on the Human Environment in Stockholm brought seriousness at international and domestic level. This was the first international conference to limelight the environment as a major issue. This conference adopted various principles for sound management of the environment like the Stockholm Declaration and Action Plan for the Human Environment and several resolutions. The Supreme Court of India also acknowledges the contribution of this conference as it played a significant role in raising environmental consciousness and establishing the notion of sustainable development. This conference highlighted principles of sustainable development, which involve pursuing sustained economic and social progress while preserving the environment and natural resources necessary for continued development. Therefore, the whole discussion simply revolves around the need of development with a clean environment vis-a-vis the right to life.

The Supreme Court of India in Charan Lal Sahu[ii] and Damadhar Rao case[iii]clearly held that right to life guaranteed under Article 21 includes the right to wholesome environment and Art. 48A and 51(g) links right to life with a polluted free environment.

What is a clean environment?

Section 2(a) of the Environment Protection Act, 1986 provide the definition of the term environment as "environment" includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property;

The clean environment therefore, should mean an environment (Water, Land and Air) does not damage the human beings and other living creatures, plants, micro-organisms and property. The idea of clean environment gets hampered if due to water, land and air the human life gets compromised.

The definition is very specifically covering three elements of nature i.e. water, *(Jal)* land *(Jameen)* and air. We will cover the forest *(Jungle)* also. How the judiciary emphasises the right to life and inter-linked with a clean environment. Therefore, in the name of development, no compromise will be done to any damage to water, land and forest. Whenever, such an issue arises the judiciary corrects the position.

The Supreme Court of India in the case of Thirumulpad v. Union of India[iv]has said that "natural resources are the assets of the entire nation. It is the obligation of all concerned, including the union government and the state governments to conserve and not to waste the resources. Any threat to ecology can lead to violation of the right of enjoyment of healthy life guaranteed under Article 21, which is required to be protected. The Constitution enjoins upon the Supreme Court a duty to protect the environment." While reiterating the role of the states, the Supreme Court stated[v] that "a healthy body is the very foundation for all human activities. In a welfare state it is the obligation of the state to ensure the creation and the sustenance of conditions, congenial to good health." The Supreme Court of India in case of Goa Foundation v.Union of India[vi], stated that the State has a power to ensure compliance with environmental laws, in particular the Environment Protection Act, 1986. This empowered the government to issue orders for closure of defaulting units which continue to operate in violation of environmental laws.

The National Green Tribunal held in the case Niranjan Bagchi vs State of Uttarakhand & Ors[vii] states that 'when the natural cycle of all five is disturbed due to mixing of poisonous or harmful material, it is the nature of pollution. We are living in the age of technology where people use the latest machines and other technological products to get our work done. We move from one place to another using a modern transport system based on bikes, cars, buses, jeeps and trucks. We use air conditioners in our homes, offices and vehicles to maintain their temperature to desired level. Pollution is a situation when something is added to the natural environment which is not naturally there; the natural environment consists of air, land and water. So, any contamination in any of the elements of the environment will be regarded as pollution; however, the nature of contamination is quite different in each component and may take many forms, land pollution, air pollution and water pollution.

Water issues and Right to life:

Since ancient times, Indians have believed in nature and consider the elements of nature like rivers, forest as God and therefore many worships are related to rivers. Ganga river carries a very important place in Hindu religion, it is called as Ganga Maa (Mother Ganga). Different puja/worship happens at the bank of Ganga River, immersing the ashes of the dead body in Ganga River is part of custom. People believe that it gives place in heaven. This is not only about the Ganga River, almost every river in India carries the same belief. The

Govt of India appealed many times to not to do it. In this regard the Supreme Court directed in the case of M.C. Mehta vs Union of India &Ors.[viii] that the practice of throwing corpses and semi-burnt corpses into the river Ganga should be immediately brought to an end. Steps should be taken by the Kanpur Nagar Mahapalika and the police authorities to ensure that the dead bodies or half-burnt bodies were not thrown into the river Ganga. The issue of Ganga River is just a representative case, it happens more or less with all the important rivers in India.

About 79% of the Ganga basin is in India. The basin covers 11 states viz., Uttarakhand, U.P., M.P., Rajasthan, Haryana, Himachal Pradesh, Chhattisgarh, Jharkhand, Bihar, West Bengal and Delhi.[ix] More than 650 million population depends upon the Ganga River. Ganga river satisfies their water needs but still the facts cannot be denied that the Ganga River is becoming a most polluted river. In the Ganga basin approximately 12,000 million litres per day (mld) sewage is generated, for which presently there is a treatment capacity of only around 4,000 mld. Approximately 3000 mld of sewage is discharged into the main stem of the river Ganga from the Class I & II towns located along the banks, against which treatment capacity of about 1000 mld has been created till date. The contribution of industrial pollution, volume-wise, is about 20 per cent but due to its toxic and non- biodegradable nature, this has much greater significance. The industrial pockets in the catchments of Ramganga and Kali rivers and in Kanpur city are significant sources of industrial pollution. The major contributors are tanneries in Kanpur, distilleries, paper mills and sugar mills in the Kosi, Ramganga and Kali River catchments.

In order to curb this issue, in 2015 the Government of India formed The Clean Ganga Fund (CGF) with the objective of to contribute to the national effort of improving the cleanliness of the River Ganga with contributions received from the residents of the country, NRIs/ PIO, and public and private companies.

The Central Pollution Control Board (CPCB) monitors water Quality of aquatic resources at 4484 locations in 28 States and 7 Union Territories spread over the country including 2108 locations on Rivers, 713 on stagnant water bodies (Lakes, Ponds and Tanks), 64 on Creeks/marine, 1235 on Wells and 364 on other water bodies (drains, canals, WTPs/STPs) in association with State Pollution Control Boards/Committees. CPCB has identified 311 polluted river stretches on 279 rivers in 30 States/ UTs in the country based on indicator of organic pollution i.e. Biochemical Oxygen Demand (BOD) (3 mg/L)[x]

The water is very much directly connected with the right to life. It's not only a basic need of human beings but of every living creature, plant, etc. Polluted water not only harms the human body but it spoils the land's quality, cultivation. Almost every High Court in India have entertained the Public Interest Litigation (PIL) relating to river pollution. The National Green Tribunal (NGT) has also dealt with such cases. Therefore, the Ganga River is not the only issue. It's also not only about the rivers, but also about the water system. It's a duty of the State to provide the clean water at the door steps of the citizens.

In 2010, the UN General Assembly explicitly recognized the human right to water and sanitation. Everyone has the right to sufficient, continuous, safe, acceptable, physically accessible and affordable water for personal and domestic use. Still till 2024, 14.24 Crore households have been receiving water at their doorstep[xi]. But it is an issue of clean and drinkable water. Safe and readily available water is important for public health, no matter whether it is for drinking, domestic use, food production or recreational purposes.

Discharge of industrial waste in rivers leads to the contamination of surface and groundwater sources. Indiscriminate use of pesticides, fertilisers, and other agrochemicals in agriculture has led to contaminated water sources over years. Inadequate sanitation facilities and open defecation practices contribute to the contamination of water sources, especially in rural areas.Improper disposal of biowaste can contaminate groundwater and surface water, leading to the spread of waterborne diseases It creates further issues to the health of living beings and therefore, is a direct threat to right to life. The Govt. of India replied in the Parliament that they do not have any exact number of how many deaths occurred due to water pollution in India.[xii]However, according to a Lancet study more than 2.3 million premature deaths happened due to water pollution in 2019.

Hence, clean water being a part of a clean environment becomes an essential part of the right to life.

Land issues and Right to life:

The land can be polluted in many ways; destroying or minimising the quality of cultivation is one of them.

Land pollution meant the deterioration of the earth's land surfaces at and below ground level. It may occur due to accumulation of solid and liquid waste materials that contaminate groundwater and soil. The term Municipal Solid Waste (MSW) is used which means and includes hazardous and non-hazardous waste. There are different waste materials and pollutants that pollute the land and thereby cause threat to. Life of all living beings. Heavy metals, pesticides, plastic, litter and pharmaceuticals are few of them that leach into soil and change the

quality of land and further degrade its natural composition. Some pollutants like chemical transformation create secondary pollutants like fumaric and phthalic acids which are also not good for life. Few other causes of land pollution are litter, waste, urbanisation and construction, mining and extraction, use of chemicals for agriculture etc.

The Municipal Solid Waste (management and Handling) Rules 1999 was made applicable from 2000. These rules provide that local bodies shall ensure that solid waste generated in the city/town is managed in accordance with the provisions of the Rule relating to collection, segregation, storage, transportation, processing and disposal. It further provides that no person should throw, burn, or bury the solid waste generated by him, on streets, open public spaces outside his premises, or in the drain, or water bodies.

Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 provides that the occupier shall be responsible for the safe and environmentally sound handling of the substances generated in his establishment. Such hazardous waste generated shall be sent to a recycler or re-user or re-processor registered or authorized or should be disposed of in an authorized disposal facility. An authorization from the state pollution control board has to be obtained foreverybody who is dealing with such substances in any manner. It further provides that on satisfaction of having the equipment's and facility of treating such substances and verification of various certificates and documents required, the pollution control board can reject or accept it.

Let's see how the judiciary has tackled the issue of land pollution and clubs it with the right to life.

In Almitra H Patel v Union of India[xiii] the court ordered the scheme of "Swachh Bangalore" involving separation of recyclable waste/non-biodegradable waste as well as domestic hazardous waste at source by means of door-to-door collection by municipal workmen. The vehicle used during transportation of such waste should be covered so as to prevent scattering of wastes on the land. Municipality should adopt recycling methods or combination of such technologies so as to minimise burden on landfill. Landfill is allowed for non-biodegradable substances, inert waste and other waste not suitable either for recycling or for biological processing. Land filling of mixed waste should be avoided unless the same is found unsuitable for waste processing.

Forest issues and Right to life:

In Banwasi Sewa Ashram v. State of UttarPradesh[xiv] the Supreme court observed that forests are national assets. On account of the depletion of forest, ecology has been disturbed and climate has undergone a major change and rains have become scanty. These have long-term adverse effects on the national economy as also on the living process. Therefore, protection of the jungle is another necessity of human society for its own survival. Jungles are not only to be protected but need to be kept clean also.

The Forest (Conservation) Act, was enacted in 1980 and subsequently amended in 1988. Section 2 of the Act forms the core and states that 'no State Government or other authority shall make, except with the prior approval of the Central Government, any order directing

1. that any reserved forest (within the meaning of the expression "reserved forest" in any law for the time being in force in that State) or any portion thereof, shall cease to be reserved;
2. that any forest land or any portion thereof may be used for any non-forest purpose;
3. that any forest land or any portion thereof may be assigned by way of lease or otherwise to any private person or to any authority, corporation, agency or any other organisation subject to such terms and conditions, as the Central Government may, by order, specify;
4. that any forest land or any portion thereof may be cleared of trees which have grown naturally in that land or portion, for the purpose of using it for reafforestation.

The forest is not about the trees, it is about the thousands of species place of living. Many tribals are still living and dependant upon the forest. We need to take note that forest sector is the second largest land use after agriculture. In remote forest fringe villages about 300 million tribal and other local people depend on forest for their subsistence and livelihood and about 70% of India's rural population depends on fuelwood to meet its domestic energy needs. For about 100 million of them, forests are main source for livelihood and cash income from fuelwood, non-timber forest products (NTFP) or construction materials. More than half of India's 70 million tribal people, the most disadvantaged section of society, subsist from forests.[xv]

Deforestation and forest degradation are the biggest threats to forests worldwide so as India. The legislation, executive and judiciary are trying their level best to protect the forest. But unless and until it does not become the public issue of their survival and unless people understand that without forest, their life will be miserable, forest cannot be protected. Short term gain will affect us badly in the long term.

Remember, *Jal, Jammen and Jungle* (Water, Land and Forest) are not required human society, without human society they can survive, in fact flourish hugely. But without*Jal, Jammen and Jungle*, human society cannot survive. Our human rights and

fundamental rights related to life all depend upon our behaviour with *Jal*, *Jameen* and *Jungle*.

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[i] **1995 Supp(6) SCR 827**

[ii] Charan Lal Sahu vs Union of India and Ors,1990 AIR 1480

[iii] **T. Damodhar Rao and Ors. vs The Special Officer, Municipal Corporation, Hyderabad, AIR1987AP171**

[iv] **T.N. Godavarman Thirumulpad vs Union of India & Ors. (1997) 2 SCC 267**

[v] **Vincent Panikurlangara v. Union of India, Delhi Transport Dept. 1987 AIR 990**

[vi] **(2014) 6 SCC 590**

[vii] **Original Application No.417/2022, National Green Tribunal Principal Bench, New Delhi**

[viii] **1988 AIR 1115, 1988 SCR**

[ix] **www.nmcg.nic.in**

[x] **https://pib.gov.in/PressReleseDetailm.aspx?PRID=1941065**

[xi] **https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2003912**

[xii] **.(https://www.downtoearth.org.in/hindistory/pollution/water-pollution/today-in-parliament-ministry-does-not- have-information-about-how-many-deaths-occur-due-to-polluted-water-in-the-country-93466)**

[xiii] AIR 2000 SC 1256

[xiv] **A.I.R. 1987 S.C. 374**

[xv] **https://www.fao.org/4/XII/0586-C1.htm**

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A Review On Wildlife Conservation Projects For The Flagship Species Of India

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Introduction

Wildlife conservation, apart from being a subject of fascination, interest, and research throughout the world, is also directly and indirectly involved with the survival of the human race. Unfortunately, the wild flora and fauna are under severe pressure due to dwindling habitat, climate change, and human intervention. It is vital that they continue to exist with minimum disturbance.

India, being a tropical country has a diverse array of climatic conditions, and thus is adorned with abundant wildlife diversity. On the other hand, India has also seen an upward trend in population ever since independence. Expansion of urbanization, agriculture, and other anthropogenic activities has led to increasing fragmentation of habitat areas and loss. This coupled with improper management and poaching has brought some of the most popular megafauna near extinction.

Many animals, including wild ones, have immense cultural and traditional reverence in India and the rest of the world. Most notable of them include the tiger, elephant, rhinoceros, lion, leopard, etc. Many of these animals serve as ecological indicators for a healthy ecosystem, which in turn brings material benefit, knowledge of genetic resources, and recreation. Public and private stakeholders can be encouraged to make active provisions for *in situ* animal conservations. The revenue generated from ecotourism can thus sustain the local population, mitigate conflicts and losses, as well as promote scientific research towards better understanding and conservation (Hundal, 2004).

The government of India has initiated several conservation projects in collaboration with several national, international, governmental, and non-governmental organizations, with varying degrees of success. The present article sums up the conservation strategies implemented for protecting the habitats of 3 iconic Indian animals, viz. the Bengal tiger, the Indian elephant, and the one-horned rhinoceros.

Project Tiger

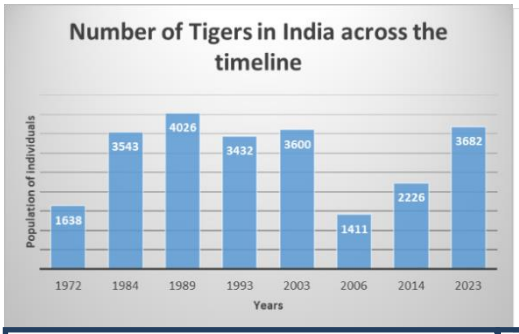
The tiger is a large feline carnivore native to South Asia. It inhabits the forested areas from Russia's far east and Northeastern China up to tropical forests of the Indian subcontinent and southeast Asia. Globally, they are represented by 9 species, out of which 3 species are extinct. The tiger is an apex predator of its ecosystem, where it regulates the population of herbivores such as deer, antelopes, hogs, buffaloes, etc. They also share habitats with other carnivores such as leopards, wolves, jackals, bears, etc (McDougal *et al.*, 1983).

The tiger has been a popular icon in history, culture, and media since old days. It has been depicted in cave paintings, coins, seals, and murals of ancient civilizations and empires, where it served as a symbol of strength, courage, and beauty. They have also been exploited as pets and novelty exotic animals in private gardens and circuses, particularly in the 19th and 20th centuries (McCarthy, 2004).

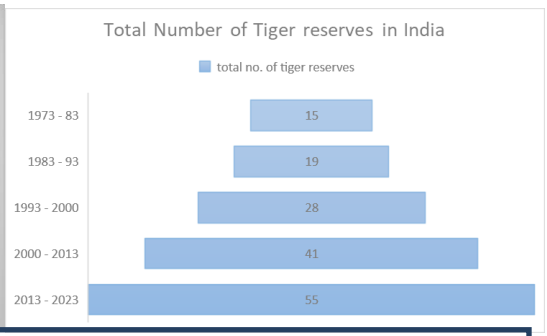
The Bengal tiger (*Panthera tigris tigris*) had been widespread on the Indian subcontinent until the 20th century. Their number was vastly affected due to game and sport hunting which was prominent till the colonial era. India still had an estimated 40,000 tigers in the wilderness during independence. However, urbanization and habitat destruction brought the wild population to the brink of extinction, with numbers plummeting below 2000 (Krishna, 2020; Sharma, 2008).

Recognizing the grave threat to the national animal, the National Tiger Conservation Authority (NTCA) was constituted as a statutory body under the then Ministry of Environment and Forests. Project Tiger was formally launched in 1973. The principal objectives were -

1) maintaining population for scientific, economic, 2)
preserving the areas of biological importance as a natural heritage for the education and enjoyment of people.
As part of the project, central assistance is provided to the states harboring wild tiger populations, along with identifying, expanding, and maintaining tiger reserves ("India's tiger population rises," 2015; Azad, 2023). These regions utilize the core/buffer strategy for conservation – protecting the tiger numbers in core zones while also catering to the interests of the native community residing in the buffer zones via awareness and sensitization. Thrust areas include surveillance, voluntary relocation of people from the core zone, addressing conflicts, strengthening regional officers, and boosting awareness and research (https://ntca.gov.in/about-us/#project-tiger).
Recent trends include monitoring using camera trapping, Geographic Information System (GIS), and M-STrIPES to help fortify and validate findings. As a result, the population has an increasing trend. The net area of the nation under the tiger reserve has also increased considerably, covering more than 2% geographical area of our country (Hundal, 2004).
However, obstacles still arise mainly because of illegal trade and poaching, even in certain protected areas. Others also point to certain individual reports, notably the Sariska incident, where the tiger population was lost completely to poaching activity; which became a setback (Suri, 2019).



1) Graphical Summary showing Tiger poulations in India since launch of Project Tiger in 1972



2) Graphical Summary showing increase in number of tiger reserves in India after Project Tiger

Project Elephant

Asian elephant (*Elephas maximus*) is the largest extant terrestrial mammal of India. It is the closest living relative to the now-extinct wooly mammoth. Elephant enjoys a special place in Indian as well as global culture. It also has a long history of domestication, particularly in Indian history, where elephants served as means of transport, hunting aid, cavalry, etc. They are raised in captivity and trained for labor. Wild male elephants (bulls), even today face a high risk of poaching for ivory.
Project Elephant was launched as a Centrally Sponsored Scheme (CSS) of the Ministry of Environment, Forests and Climate Change (MoEF&CC) in 1992. It focuses on the following objectives 1) protection of the animal, its habitat, and migratory corridors; 2) address man-animal conflicts; 3) welfare of captive elephants. The following activities are undertaken –

- Ecological restoration of habitats and corridors
- Developing scientific and planned management of habitats and population
- Mitigation of conflicts
- Protection against poaching and unnatural death
- Research, Public Education, and Awareness programs related to elephant management
- Eco-development, Rehabilitation and Veterinary Care

As part of the project, enumeration of wild elephants is carried out every five-year interval. Comparative figures state that the estimated population has increased. The project has 28 elephant reserves listed formally by various state governments.
MIKE (Monitoring of Illegal Killing of Elephants) started in 2003 in South Asia with objectives such as measuring levels and trends in the illegal hunting of elephants, tracking the changes in trends over time, and determining factors associated with the changes (https://moef.gov.in).
The Steering Committee members of Project Elephant have met 13 times since inception (the last meeting was on 17th December, 2014 at Parliamentary House, New Delhi). The agenda of meetings includes reviewing the data from the census, declaration of Elephant Reserves, preventing deaths particularly due to train hits, mitigation of

incidents and losses from crop raids, constituting a Task force, etc. The meetings discuss issues such as protection from railway crossing accidents, boosting reserve areas, increasing corridors, crop raids, and landscape-based conservation approaches (Proceedings of steering and consultative committees of Project Elephant conducted on 2014 - 15).

3) Graphical Summary showing elephant poulations in India since launch of Project Elephant in 1972

Indian Rhino Vision 2020 (IRV2020)

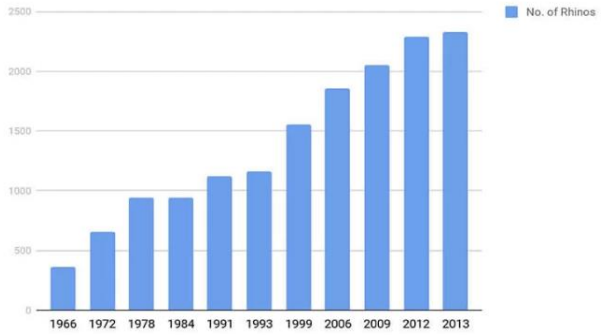
The northeastern front of India and Nepal houses the majestic greater one-horned rhinoceros (*Rhinoceros unicornis)*, also known as the great Indian rhinoceros or Indian rhino. Globally, rhinoceros are represented by 5 species, out of which the black rhino and white rhino are found in the African Grasslands. Javan and Sumatran rhinos are considered the smaller ones. The Indian rhino is the second largest rhino (after the white rhino) and is also the second largest terrestrial mammal in India, after the Asiatic elephant. Unlike its African and Sumatran counterparts, the Indian and Javan rhinos are one-horned. It is a large herbivore that is solitary and has very few predators (Laurie *et al.*, 1983).

Evidence and historical findings suggest that Indian rhinos were abundant in the northern Indian subcontinent, particularly in the Indo-Gangetic plains. Human intervention and habitat loss brought them to the cusp of extinction. Poaching of rhinos was (and even presently) a serious concern. Sport hunting of these animals became a regal practice, particularly during colonial rule. By the early 20th century, they were closest to extinction, notably only 12 individuals were found in Kaziranga National Park in 1908. This served as a wake-up call for the then-viceroy of India, who then immediately declared Kaziranga a protected area. Due to timely intervention and effective conservation methods, Kaziranga soon got repopulated with rhinos. This led to new problems, such as overcrowding of rhinos, particularly in Kaziranga, Orang, and Pabitora national parks. This increased population of rhinos now posed a considerable risk of inbreeding stress, sudden epidemics, and even losses by natural calamities like flooding, which could rapidly undo all previous efforts. Thus there was a need to

1) improve security against poaching in all rhino areas (of Assam)
2) relocate rhinos from overcrowded regions to other sites, to maintain ecological balance

Indian Rhino Vision 2020 (IRV 2020) was launched in 2005 as a collaborative program of the Forest Department of Assam, the International Rhino Foundation, Bodoland Territorial Council, WWF – India, and the US Fish and Wildlife Service. IRV aimed at increasing the total rhino population in Assam from around 2000 (in 2005) up to 3000 by 2020. It is also aimed at the rhino population and is distributed to over 7 protected areas to overcome overcrowding. The areas selected for wild-to-wild relocation were as follows – Manas, Laokhowa, and Dibhru Saikhowa. The following steps are taken in each phase of the program - formation of the task force for translocations, assessment by security expert groups, monitoring rhinos suitable for translocating, locating a suitable site for introducing the animal, permissions regarding tranquilizing and collaring, a training workshop for translocation, actual translocation, and monitoring of the translocated animal (https://wwfin.awsassets.panda.org).

The program was officially closed in 2021 following the transfer of 2 rhinos from Kaziranga, Orang, and Pabitora to Manas. It was successful in attaining its first goal, resulting in 3262 rhinos in the wild in 2023. Manas National Park also received the status of a world heritage site. Poaching instances have also been reduced by around 86%. However, the program was able to relocate the animals in only one (Manas) out of other protected areas (https://www.drishtiias.com).



4) Graphical Summary showing rhino poulations in India
Credits: Indian Rhino Vision Population Modelling workshop, November 2014 Final Report

Year	No. of Rhinos
2008	2
2010	2
2011	4
2012	10
Total	**18**

5) Table showing successful rhino relocations across years
Credits: Indian Rhino Vision Population Modelling workshop, November 2014 Final Report

Conclusion

Project Tiger, Project Elephant, and IRV2020 have successfully increased the population of tigers, elephants, and rhinos steadily in their respective habitats. Due to regulated monitoring, in many places, recovery of the population has taken place, which has also led to the protection of the habitats as well as other native plants and animals. The importance of conservation and awareness among local communities and the general public has also increased, leading to minimum resistance and greater support for conservation. Local extinctions of the animals were tackled by wild-to-wild relocations. Knowledge about the behavior and intricate role of the animals is boosted by increased research initiatives. Challenges including poaching and illegal trade of wild animals persist and require stringent regulations. The ever-increasing human populations have expectedly increased conflict with the animals due to habitat loss and fragmentation.

The other notable Indian wildlife projects include the Asiatic Lion, Snow Leopard, Sea Turtle, Ganges River Dolphin, Hangul, Great Indian Bustard, Vulture, Crocodile, etc. India is also a member of collaborative programs, such as Indo-Russian Cooperation on Migratory Birds and South Asia Wildlife Enforcement Network i.e. SAWEN comprising nations such as Bhutan, India, Nepal, Pakistan, Afghanistan, Bangladesh, Sri Lanka, and Maldives (Srikant *et al.*, 2023). These projects ensure mutual collaboration for organized and effective enforcement of wildlife protection and conservation. There is a need to apply a holistic approach to wildlife conservation integrating conversation science with legislation and other stakeholders for a sustainable future.

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Judicial Verdicts and Noise Nuisance

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Abstract

Noise is resembling the atmosphere silhouette in the public enemy whose emergent threat has enlarged in the recenttime of lifeowing to hastyevolution of suburbanization, industrial development and progression of science and equipment.Today the challenge of noise pollution has arisen as one of the gravedifficulties and it has become a significant challenge to the quality of life of the people in India. The overlapping provisions in the Indian Constitution make noise lawsuits more problematic to implements legal provisions by judiciary. The role of judiciary on that occasion become very imperative to settle on such types of legal action. Hence in this esteem study of judiciary to challenge noise pollution nuisances is taken in attention in this article.

Key Words- *Noise, Pollution, Nuisance, Judiciary, verdicts*

Introduction

With other pollutants noise is one kind of pollutant though not seen by eyeballs directly still the live through earsplitting environments is not at ease. Experience of person when he goes to bet and would like to sleep comfortably and ease between that sleep without any expectation noise interrupts,then the feeling of person is too bad to whole day. He not eats properly not concentrate on his daily activities cautiously. Not only this the students or learners with relax mood give attention towards study and meanwhile noise disturbs concentration of that learner the situation of that learner is become worse. He not concentrates properly to study and not live apart from study. Whole day might be he suffer from annoyance. Many of the time its observed that noise not attentive of general public but who are on sickbed trouble a lot due to noise problem. Due to noise nearby them these persons not cure well emotionally. Such type of experience many of the time observe in civic society at all times.

Study with these points writer in this study concentrate on various issues-

- Whether noise become serious nuisancebefore civic society?
- Whether right to life is secure with noise pollution?
- what is the role of judiciary to safeguard the right to life apart from noise pollution?

Meaning of noise-

Pollution is a noun derived from the verb 'pollute.' Section 2(c) of the Environmental (protection) Act, 1986 defines, "environmental Pollution mean the presence in the environment of any environment pollution." Section 2 (b) of the said act defines, "Environmental Pollutant any solid, liquid, or gaseous substance present in such concentration as may be, or tend to be injurious to environment." Thus, the disturbance produced in our environment by the undesirable sound of various kinds is called noise pollution.The word 'noise' is copied from the Latin expression 'nausea' which indicates the meaning of 'unwanted sound', a potential hazard to health and communication dumped into the environment without regard to the adverse effect it may have on unwilling ears.'[i]

Noise as nuisance-

The term nuisance is not defined in proper sense in legal term but whatever gives affection through disturbance, create annoyance, generate irritation form of circumstances etc. indicates that there is nuisance. In such situation noise created annoyance, disturbance, irritation from its existence. Hence noise is one kind of nuisance prove affirmatively.

Right to life and noise pollution-

In ***Subhash Kumar v. State of Bihar***[ii] Supreme Court observed that In Article 21 of the Indian Constitution includes Right to life and such right club with pollution free environment including fresh air, clean water. Any hamper in these rights' person has remedy to access under article 32 of the Indian Constitution. Thought in this case not any direct reference is made of the noise pollution still any circumstances exist whose make life miserable, troublesome, unhealthy, unpeaceful then its affect to right life. In this sense due to noise nuisance disturb the public then it's come under violation of right to life under article 21 of the Indian Constitution. Right to life is fundamental right guaranteed by Indian Constitution under Article 21.

Right to life doesn't mean existence of life but apart from that whatever requires for the quality

of life all has gathered in Right to life. It's observed that many of the time due to noise outbreak hampered quality of life. In *T. Damodhar Rao v. Municipal Corporation,Hyderabad*[iii], it was observed, "It would be reasonable to hold that the enjoyment of life and its attainment and fulfillment guaranteed by Article 21 of the Constitution embrace the protection and preservation of nature's gifts without life cannot be enjoyed. There can be no reason why practice of violent extinguishment of life alone should be regarded as violative of Article 21 of the Constitution".

Judicial Verdicts and noise pollution

Citizens of India accepted to subsist in society in peaceful, freedom from noise which affects to physical as well as emotional health. Persons have a right to live in a society free from pollution. Judiciary take cautious towards the rights guaranteed by the constitution.

1) Article 19(1)(a) and Article 21 of Indian Constitution

It's observed that many of the time Article 19(1)(a) and Article 21 are extend beyond with each other concerning to noise pollution problem. Article 19(1)(a) provides to all the citizens a fundamental freedom of speech and expression, whereas Article 21 gives citizens a right to live in a healthy environment. In Indian Constitution its mentioned that the freedom provided under Article 19(1)(a) is not absolute and is subject to certain reasonable restrictions under Article 19(2) of the constitution.

In *Rajni Kant v. State of U.P.*[iv]in municipal Board of Allahabad petitioner ask for approval from executive officers for operating loudspeaker on the ground that they violated the right to freedom of speech and expression. The Court, while write off the petition, expressed the view that use of mechanical instruments like loudspeaker and amplifier is not covered by the guarantee of freedom of speech and expression under Article 19(1)(a) of the Constitution.

P.A. Jacob v. Superintendent of Police, Kottayam[v], the requester wanted authorization to apply mikes at a civic parting where he planned to denounce the exercise of an orthodox Christian Sect which obstructed its members from wedding outside their denomination. When the sub-inspector of police withdrew loudspeaker approval, apprehending that the petitioner's view may cause public syndrome, the petitioner approached the Kerala High Court claiming that the action of the respondent violated, inter alia, his fundamental freedom under Article 19(1)(a). The Kerala High Court held that the fundamental right to freedom of speech expression guaranteed in Article1(1)(a) of the Constitution does not include the right to use loudspeakers or sound amplifiers. It was rightly observed that the right to speech implies the right to silence. It implies freedom, not to listen, and not to be forced to listen. The right comprehends freedom to be free from what one desires to be free from. Acquaintance to high noise involves risk and it is proved to cause bio-chemical changes in man which may be dangerous and it would amount to a clear infringement of the Constitutional guarantee of right to life, under Article 21 of the Constitution. In other words, right to life comprehends right to a safe environment, including safe air quality, safe from noise.

2) Article 19(1)(g) and Article 21 of Indian Constitution-

Article 19(1)(g) of Indian Constitution gives guarantees of freedom of practice, or to carry on any occupation, trade or business. This right is not absolute and have some reasonable restrictions which shows in Article 19(6) of the Indian Constitution. Thus, a citizen cannot exercise fundamental freedom under Article 19(1)(g) in such a manner so as to violate the fundamental right of the people under Article 21 of the Constitution.

In *Ram Lal v. Mustafabad Oil and Cotton Ginning Factory*[vi], The Punjab and Haryana Court observed, "Once a noise is considered to be a nuisance of the requisite degree it is no defence to contend that it was in consequence of a lawful business or arose from lawful amusements or from places of religious worship."

3) Article 19(1)(a), Article 25 and Article 21 of Indian Constitution

There is close relevancy between Article 19(1)(a) and Article 25 and Article 25 of the Indian Constitution. Question become more complex when right to religion under article 25 male use of loudspeakers resulting in noise pollution, which becomes a health hazard to the people and violates their fundamental right under Article 21 of the Constitution. The Judiciary has examined the right to use loudspeakers in exercise of their freedom of religion in the light of right to live in pollution free environment.

In *State of Bombay v. Narsu Apa Mali*[vii], High Court observed, "A sharp distinction must be drawn between religious faith and belief and religious practices. What the state protects is religious faith and belief. If religious practice run counter to public order, morality or health or a policy of social welfare upon which the state has embarked, then the religious practice must give way before the good of the people of the state as a whole."

In *Noise Pollution(V), In Re,*[viii]Supreme Court made it clear that by restricting the time of bursting the fire crackers there is no violation of religious rights of any person as enshrined under Article 25 of the Constitution. In this case the Supreme Court, inter alis, issued the following directions-

1. The department of Explosives may divide the firecrackers into two categories:
i) Sound emitting firecrackers; and
ii) colour/light emitting firecrackers.
2.There shall be a complete ban on bursting sound emitting fire crackers between 10 p.m. and 6a.m.
3. The noise level at the boundary of the public place, where loudspeaker or public address system or any other noise source is being used shall not exceed 10dB(A) above the ambient noise standards for the area or 75dB(A) whichever is lower.
4.No one shall beat a drum or tom-tom or blow a trumpet or beat or sound any instrument or use any sound amplifier at night (between 10 p.m. to 6 a.m.) except in public emergency.
5. The peripheral noise level of privately-owned sound system shall not exceed by more than 5dB(A) than the ambient air quality standards specified for the area in which it is used, at the boundary of the private place.
6. No horn should be allowed to be used at night (between 10 p.m. to 6a.m.) in residential area except in exceptional circumstances.
7.There is need for creating general awareness towards the hazardous effects of noise pollution. For this purpose, the need to add a suitable chapter in the textbooks of children to sensitize them, role of the Resident Welfare Associations and service clubs, and special public awareness campaign in anticipation of festivals, events and ceremonial occasions has been emphasized.

Conclusion-

With the above discussion it's clear that noise create noise nuisance in the society. Many of the time its affects right to life guaranteed under Article 21 of the Constitution. Lie on top with other fundamental rights like Article19(1)(a) Article19(1)(g) and Article 25 of the Constitution also made most of time. read-through various judicial verdicts make sufficiently clear that the judiciary has shown its deep concern to keep the environment free from noise pollution. However, as pointed out by the Supreme Court, there is lack of awareness as well as implementation of these rules. There is also need for specific legislation to control and prevent noise pollution. Therefore, the need of the hour is to create awareness among the people about the noise pollution and its effects on their health.

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[i]Noise pollution(V), Re (2005) 5 SCC 733 at 746.
[ii](1991) 1 SCC 598.
[iii]A.I.R. 1987 A.P. 171.
[iv]A.I.R. 1958 All 368.
[v]A.I.R.1998 Ker. 1 at 5,6, and 8.
[vi] A.I.R. 1968 P.& H. 399.
[vii]A.I.R. 1952 Bom. 82
[viii](2005) % SCC 733.

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Combating Biopiracy: Protecting Traditional Knowledge and Biodiversity in the Face of Intellectual Property Exploitation

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Abstract:

Biopiracy, the appropriation of traditional knowledge and biological resources without proper acknowledgment or compensation, poses a significant challenge to intellectual property law and indigenous communities. This paper examines notable instances of biopiracy, including the patents on turmeric, neem, ashwagandha, and jamun, to highlight the ongoing conflicts between modern intellectual property systems and traditional knowledge. These cases reveal how traditional practices, deeply rooted in indigenous cultures, are often exploited for commercial gain by external entities, leading to legal disputes and the need for reform.The revocation of patents for turmeric and neem demonstrates a positive shift in recognizing the prior art of traditional knowledge, but challenges persist in proving the originality of such knowledge within the constraints of existing intellectual property frameworks. The struggle to protect traditional knowledge illustrates systemic gaps in current patent laws, which frequently fail to account for the cultural and historical significance of these practices.This paper argues for comprehensive legal reforms to better safeguard traditional knowledge and ensure fair compensation for indigenous communities. Strengthening intellectual property protections is essential not only for preserving cultural heritage but also for fostering ethical scientific advancement. By integrating respect for traditional knowledge into intellectual property systems, we can work towards a more just and sustainable global knowledge economy.

Key Words: Biopiracy, Intellectual Property Law, Traditional Knowledge, Indigenous Resources, Patent Revocation, Turmeric, Neem, Ashwagandha, Jamun, Cultural Heritage, Biodiversity, Prior Art, Traditional Knowledge Digital Library (TKDL), Biopiracy Disputes, Global Knowledge Economy

Introduction:

Biopiracy, the act of patenting traditional knowledge and biological resources without proper acknowledgment or compensation to the communities from which they originate, has become a pressing issue in intellectual property law. This practice often involves the appropriation of indigenous knowledge and natural resources by entities that seek to commercialize them for profit, frequently disregarding the original custodians' contributions and rights.

India, with its rich history of traditional medicine and biodiversity, has been particularly affected by such practices. Traditional Indian knowledge has long recognized the medicinal and therapeutic properties of various plants and herbs. However, the increasing trend of foreign entities filing patents on these established uses has sparked significant disputes. These conflicts highlight the tension between the global intellectual property system and the traditional knowledge systems that have nurtured and preserved these resources for centuries.

The following sections will explore specific instances of biopiracy, demonstrating how industrialized nations are financially exploiting biological resources associated with indigenous knowledge through patents. This exploitation presents a significant threat to the survival and integrity of indigenous communities and their traditional knowledge systems.

Turmeric Patent Revocation:

Turmeric, a tropical herb primarily cultivated in eastern India, has a long-standing reputation for its diverse applications. In Indian tradition, turmeric powder is valued not only as a spice but also for its medicinal properties and its use as a dye. Its medicinal applications include acting as a blood purifier, aiding in the treatment of common colds, and serving as an anti-parasitic agent for various skin infections. In culinary practices, turmeric is a staple ingredient in many Indian dishes.

In 1995, the University of Mississippi Medical Centre was awarded a patent in the United States for the use of turmeric in wound healing. This patent claimed rights over both oral and topical applications of turmeric powder for treating wounds. However, the Indian Council for Scientific and Industrial Research (CSIR) contested this patent, arguing that the use of turmeric for wound healing was already well-documented and widely known in India. Despite the challenge, finding published

information that specifically documented turmeric's use for wound healing in both oral and topical forms was challenging. The CSIR conducted an exhaustive search and identified 32 references across various languages, including Sanskrit, Urdu, and Hindi.

The United States Patent and Trademark Office (USPTO) ultimately agreed with the CSIR's objections. The USPTO concluded that the patent claims were based on knowledge that was already in the public domain and that the therapeutic uses of turmeric were well-established prior to the patent application. As a result, the USPTO revoked the patent, acknowledging that the traditional knowledge of turmeric's wound-healing properties, which was deeply rooted in Indian practices, should be preserved and protected.

Neem Patent Revocation:

The patent for Neem was initially filed by W.R. Grace and the U.S. Department of Agriculture at the European Patent Office. This patent covers a method for controlling plant fungi by applying a Neem oil formulation. India challenged this patent through a legal opposition led by the Research Foundation for Science, Technology and Ecology (RFSTE) in New Delhi, in collaboration with the International Federation of Organic Agriculture Movements (IFOAM) and Magda Aelvoet, a former Green Member of the European Parliament (MEP).

The Neem tree, native to India, is renowned for its extensive medicinal properties. It contains several active compounds, particularly azadirachtin, which is extracted from its seeds. Neem has a long history of use in treating various ailments, including leprosy, diabetes, skin disorders, and ulcers. Neem twigs have also been traditionally used as antiseptic toothbrushes. The opposition presented evidence from ancient Indian Ayurvedic texts, demonstrating that Neem's hydrophobic extracts have been known and utilized in India for centuries to treat dermatological conditions and protect crops from fungal infections.

Following this opposition, the European Patent Office (EPO) found the patent lacked novelty and an inventive step, and it was subsequently revoked. Additionally, several U.S. patents have recently been issued for Neem-based emulsions and solutions, reflecting the ongoing interest in Neem's applications.[i]

Ashwagandha Patent Revocation:

Withania somnifera, commonly referred to as Indian ginseng and Indian Winter Cherry, is a significant ancient plant whose roots have been used in Ayurveda and Unani, two of the oldest medical systems in India. It is indigenous to arid parts of India. It thrives in arid subtropical areas. The primary Ashwagandha-producing states in the nation include Madhya Pradesh, Gujarat, Maharashtra, Rajasthan, Punjab, Haryana, and Uttar Pradesh. Additionally, Australia, East Asia, and Africa are its native regions. Sanskrit for "horse's scent," ashwagandha derives its name from the fragrance of its root, which is said to be like that of a sweating horse. Latin for "sleep bearing," somnifera is the name of the plant.

Ashwagandha has been used in Ayurvedic therapy for more than three thousand to four thousand years, according to Punarvasu Atriya, a revered rishi (sage). The Charaka and Sushruta Samhitas, two revered scriptures of Ayurveda, both contain descriptions of it. This species is a little, delicate perennial shrub that can reach heights of 35–75 cm (14–30 in). Radially branching from a central stem are tomentose branches.

The leaves are oval, dull green, and often 10 to 12 cm long. Small, green, and bell-shaped, the blooms are. Fruit that is ripe appears orange. The Ayurvedic and indigenous medicinal systems have employed ashwagandha, also known as Indian ginseng or winter cherry, as a useful plant. The berries, leaves, and roots all have a great deal of therapeutic benefit. Ashwagandha is a well-known Ayurvedic botanical rejuvenator that is used in a variety of tonics and formulas. It is the best rejuvenator because it supports the healthy functioning of the adrenals and reproductive system while assisting in maintaining proper nourishment of the tissues, especially the muscles and bones.[ii]

American and Japanese businesses submitted requests for the issuance of patents in their favour for Ashwagandha formulations or extracts in May 2001. The Pola Chem Tech patent filing from Japan was for a topical skin ointment used for fertility enhancement and aesthetic purposes, while the New England Deaconess Hospital in the US was successful in obtaining a patent for its usage to treat the symptoms of arthritis. A patent application titled "Method of Treatment or Management of Stress" was submitted to the European Patent Office by Natreon Inc. on July 27, 2006, citing Ashwagandha's long history of usage in the treatment of anxiety-related stress, depression, sleeplessness, stomach ulcers, and convulsions (European patent 1906980).

Only one of the several patents issued in favor of ashwagandha was successfully revoked by India. On July 6, 2009, Indian officials responded by providing evidence from the Traditional Knowledge Digital Library (TKDL) and certain papers from the 12th century to thwart their endeavor. The components of this miracle plant are well-recognized as aphrodisiacs, diuretics, and for recovering memory loss in our ancient ayurveda medical system. Due to the exhausting efforts, the EPO determined on March 25, 2010, to reject the American company's strong claims over the Indian ginseng.[iii]

Jamun Patent Revocation:

Syzygium cumini, often referred to as jambul, jambolan, jamblang, or jamun, is a tropical evergreen tree belonging to the Myrtaceae genus of flowering plants. Native to the Indian Subcontinent and surrounding areas of Southeast Asia, Syzygium cumini. The species is found in Indonesia, Malaysia, the Philippines, Bangladesh, Pakistan, Nepal, Sri Lanka, and India. The fruit's name is occasionally rendered incorrectly as blackberry, which belongs to a different family of fruits. Indian immigrants helped spread Syzygium cumini outside of India, where it is now widespread in erstwhile tropical British possessions.

The tree is known to have grown for a significant amount of time over the period of recorded history on the Indian subcontinent and many other neighboring regions of South Asia, including India, Bangladesh, Burma, Nepal, Pakistan, Sri Lanka, and Indonesia. It was long ago brought to Malaysia and became a native there. The tree is revered by Buddhists in southern Asia, and because Lord Krishna considers it to be sacred, it is frequently planted next to Hindu temples. The plant has also been brought to a variety of locations where it is used as an ornamental, a fruit producer, and for its wood. The plant may be found across India's plains from the Himalayas to southern India.[iv]

Cromak Research Inc., a New Jersey-based company, received US patent No. 5,900,240 on May 4, 1999. Three nonresident Indians, Onkar S. Tomer, Kripamath Borah, and their colleague, Peter Gloniski, served as the assigners.Since such use is well-known and well-documented in India, the US Company's claim that using jamun for anti-diabetic treatment was an innovation was found to be fraudulent. The validity of the patent was contested due to prior art. "'Prior art' comprises the indigenous knowledge and practises. Since patents are only meant to be granted for new innovations based on originality and non-obviousness, no patent should be issued when previous art is present. These standards determine ingenuity, and inventions are awarded exclusive rights through patents.

On the grounds of previous art and a lack of innovation, the patent was contested. However, "Article 102 of the US Patent Law does not accept technology and processes in use in other countries as previous art," as it defines prior art. As a result, the Jamun could be eligible for US patent protection. However, this patent did cause a stir in India since it was viewed as biopiracy, or the theft of Indian Traditional Knowledge.

Neem Patent Revocation:

Neem extracts can be used to combat a wide range of pests and fungal diseases affecting food crops. The oil from neem seeds is useful for treating colds and flu, and when mixed into soap, it offers relief from malaria, skin conditions, and even meningitis. In 1994, the European Patent Office (EPO) awarded a patent (EPO patent No. 436257) to W.R. Grace Company and the US Department of Agriculture for a method of controlling plant fungi using hydrophobic neem oil. In 1995, a coalition of international NGOs and Indian farmers challenged the patent, arguing that the fungicidal properties of neem seed extracts had been known and used in Indian agriculture for centuries, thus rendering the patent unpatentable. By 1999, the EPO agreed that the information covered by the patent was already public before the application, and deemed the patent lacked an inventive step. Consequently, the EPO revoked the neem patent in May 2000. In March 2006, the EPO upheld its decision to cancel the patent despite a challenge in 2001 from the USDA and W.R. Grace, a multinational chemical company.[v]

Conclusion:

The cases of turmeric, neem, ashwagandha, and jamun illustrate the ongoing conflict between traditional knowledge and modern intellectual property systems. These instances reveal how biopiracy—exploiting indigenous resources and knowledge without proper acknowledgment—remains a pressing issue. Despite successful revocations of patents on turmeric and neem, the challenge of demonstrating traditional knowledge as prior art persists.

The frequent disputes over these patents highlight systemic gaps in intellectual property law, which often fails to account for the historical and cultural significance of traditional knowledge. This creates a vulnerability for indigenous communities, whose contributions are often inadequately protected against commercial exploitation. Therefore, addressing biopiracy requires comprehensive reforms in patent laws to ensure they recognize and respect traditional knowledge, integrating fair compensation mechanisms for the original custodians.

Strengthening these protections is essential not only for preserving cultural heritage but also for fostering ethical and equitable scientific advancement. By aligning intellectual property systems with the principles of justice and respect for indigenous knowledge, we can better safeguard these invaluable resources and promote a more inclusive and sustainable global knowledge economy.

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[iii] **"Ashwagandha next on patent hunters list", Hinduism Today (16 May 2001), available at Ashwagandha Next on Patent Hunters' list – Hindu Press International (hinduismtoday.com)**

[iv] **Available at https://en.wikipedia.org/wiki/Syzygium_cumini**

[v] **Available at official website of TKDL https://www.tkdl.res.in/tkdl/langdefault/common/BioPiracy.asp?GL=Eng**

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Soil Conservation For A Sustainable Future

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Abstract

Soil conservation and sustainability are essential for maintaining healthy ecosystems and ensuring food security. It involves practices like preventing erosion, minimizing nutrient loss, and promoting soil fertility. With growing concerns about environmental degradation, preserving and protecting the soil resources is of utmost importance because healthy soil supports plant growth and helps prevent water pollution.

There is a need for education, awareness, and collaboration among stakeholders to ensure the adoption of sustainable soil management practices as it plays a vital role in achieving a sustainable future. Here are a few key points discussed in this review paper about soil conservation and sustainability like soil erosion is a major concern, and it can be prevented through techniques like contour ploughing, terracing, and the use of cover crops. Sustainable agriculture practices, such as organic farming and agro forestry, help to minimize the use of chemicals and promote biodiversity.

Composting organic waste and using natural fertilizers contribute to soil sustainability. Responsible land management practices, like avoiding overgrazing and deforestation, helps to protect the soil. Soil testing and nutrient management are important for maintaining soil health and fertility. Education and awareness play a crucial role in promoting soil conservation and sustainability. Implementation of these strategies can protect soil resources, maintain agricultural productivity, and ensure the long-term sustainability of our ecosystems.

Keywords: soil conservation, sustainability, water management, conservation practices.

Soil:

Soil is a central component and a fundamental constituent in sustaining life on earth [1]. It forms over time through the breakdown of rocks and organic matter and is made up of mineral particles (sand, silt, clay, organic matter (decayed plants and animals), water, air, living organisms (microbes, insects, roots). Soil provides essential ecosystem services, including supporting plant growth and agriculture, filtering and storing water, regulating the climate, supporting biodiversity and storing carbon.

It alsoplays a significant role in farming and food production. Globally the world has witnessed severalcalamities, pandemic, climatic extremes such as drought, floods, water logging, etc. Whenever, if thought about food grain production and sustaining life on earth, the soil comes first to fulfilling food and nutrition. Since organic nutrients source is insufficient for optimum food production and nutritional security it requires fertilizer inputs. The different function of soil is given in Fig.

No. 1.Soils are threatened by many problems such as soil erosion by water and wind, soil organic carbon loss, soil nutrient imbalance, soil salinization, soil contamination, acidification, loss of soil biodiversity, soil sealing, soil compaction and waterlogging.

As it is a finite and valuable resource, soil requires conservation and sustainable management to ensure its long-term health and productivity.

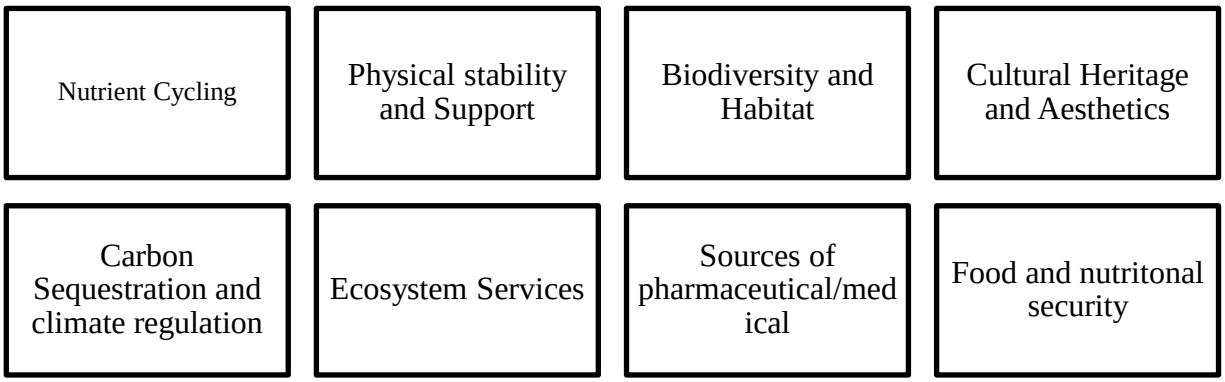

Figure No. 1: Different function of soil

Soil conservation:

Environmental sustainability is a crucial concept that focuses the need to preserve and protect the natural resources for the benefit of current and future generations. It encloses the responsible management of resources, ecosystem conservation, and the promotion of practices that minimize environmental impact. Achieving environmental sustainability is critical for maintaining the health and well-being of the planet and all its inhabitants [2]. The world is facing numerous environmental challenges, including habitat loss, climate change, pollution, deforestation, and soil degradation. These issues constitute significant threats to biodiversity, human health, and the overall functioning of ecosystems. It is essential to address these challenges through sustainable practices to ensure a sustainable future for the planet. One key characteristics of environmental sustainability is soil conservation. Soil is regarded as a vital resource that supports life on Earth. It serves as a medium for plant growth, filters pollutants, stores water and provides habitat for numerous organisms. However, unsustainable land use practices, such as improper agricultural techniques, deforestation, and overgrazing, have led to widespread soil degradation[3].

Threats to soil conservation:

According to the United Nations, the primary threats to soil conservation are climate change and traditional farming practices. Traditional farming practices include the overuse of harmful pesticides that contaminate soils, land overuse and slash-and-burn methods. Soil conservation aims to mitigate these threats.

- **Chemical contamination**: With harmful chemicals, usage of pesticides can contaminate the soil, as well as nearby vegetation and water sources. In addition to contamination, these chemicals used on crops can be toxic to important beneficial insects, such as bees, as well as fish and bird populations.
- **Slash and burn**: It is the practice of burning and clearing forests to make way for farmland. This method kills plant species, displaces wildlife from their natural habitats. Land cleared using slash and burn is only used when it is productive for farming. Once the soil fertility is lost, another patch of forest is identified for clearing. This unsustainable process repeats endlessly, preventing soil from recovering sufficiently to support healthy ecosystems.
- **Land overuse**: Overuse of land can limit soil's ability to play its part in the global climate cycle.
- **Limited Awareness and Education:** Insufficient knowledge and understanding of soil conservation practices among farmers, policymakers, and the general public can hinder effective soil conservation efforts.
- **Soil Erosion:** Water and wind erosion can lead to soil degradation and loss of fertile topsoil.
- **Deforestation and Land Clearance:** Removing trees and vegetation can increase soil erosion and reduce soil health.
- **Over-Tilling and Intensive Farming:** Excessive ploughing and farming can damage soil structure and reduce organic matter.
- **Soil Pollution:** Chemical pollutants and waste can contaminate soil, affecting ecosystems and human health.
- **Climate Change:** Rising temperatures and altered precipitation patterns can impact soil moisture, structure, and fertility.
- **Urbanization and Land Development:** Soil sealing and construction can lead to soil compaction and loss of productive land.
- **Soil Degradation:** Soil acidification, nutrient depletion, and reduced organic matter can impact soil fertility and productivity.
- **Lack of Sustainable Practices:** Inadequate adoption of conservation tillage, cover cropping, and crop rotation can exacerbate soil degradation.Addressing these threats requires a comprehensive approach to soil conservation, involving sustainable agricultural practices, policy support, and public awareness.

Soil Conservation- Preserving Earth's Vital Resource:

Soil conservation is the practice of preventing soil erosion, degradation, and depletion, while promoting its sustainable use and management. It involves in implementing important measures to protect the soil from erosion, improving soil fertility, and adopting sustainable agricultural practices. Soil conservation is important for maintaining agricultural productivity, preserving water quality, and safeguarding ecosystems.Soil provides the essential nutrients for plant growth, animal life, and millions of microorganisms. However, if soil becomes unhealthy, unstable Soil conservation emphasizes on keeping soils healthy through a combination of practices and techniques including those farming operations and management strategies conducted with the goal to control soil erosion[4].

Strategy for soil conservation:

Different types of soil conservation methods ensure prolonged usage of land and keep it productive for future generations. The following are the practice for soil conservation and their benefit from different conservation techniques.

Conservation Tillage

Conservation tillage is a farming practice that aims to reduce soil erosion, improve soil health, and conserve water. It involves leaving the previous year's crop residue on the field before planting the next crop. This residue acts as a natural mulch, protecting the soil from erosion by wind and water. Conservation tillage helps to maintain soil structure, increase organic matter content, and reduce the need for excessive tilling, which can lead to soil compaction[5]. There are different types of conservation tillage, such as no-till, minimum tillage, and reduced tillage. No-till farming involves planting seeds directly into untilled soil, leaving the previous crop residue undisturbed. Minimum tillage involves minimal soil disturbance, while reduced tillage is a compromise between conventional tillage and no-till practices.

Crop Rotation

Crop rotation is another effective soil conservation practice used in agriculture. It involves planting different crops in a particular sequence on the same piece of land over time. This method helps to maintain soil fertility, reduce soil erosion, control plant soil-borne diseases[6,7], and improve overall crop yield. By rotating crops, farmers can break pest and disease cycles because different crops attract different pests and diseases. Additionally, planting a variety of crops helps to improve soil structure, increase organic matter content, and enhance nutrient availability in the soil. Different crops have varying root structures, which can help break up compacted soil and prevent soil erosion.

Contour Ploughing

Contour ploughing is all about ploughing the land in a way that follows the natural curves of the landscape. This method helps to slow down water flow, reduce soil erosion, and improve water retention in the soil. By ploughing along the contour lines, it creates small barriers that prevent water from washing away the topsoil and prevents nutrient-rich top soils from eroding excessively [8]. It can be used in various types of soil, including sandy soil, loamy soil, clay soil, and more. The key is to adjust the ploughing depth and technique based on the specific characteristics of the soil to ensure effective water retention and erosion control. It's a versatile method that can be adapted to different soil types to promote soil conservation practices.

Terracing

Terracing is another fascinating technique used in soil conservation. Terraces have been widely adopted to control soil erosion [9,10,11]. It involves creating steps or flat areas on sloping land to reduce erosion and improve water retention. By building terraces, it helps to slow down water runoff, prevent soil from washing away, and create more stable areas for farming. It's like creating little staircases for the land to hold onto its nutrients and prevent erosion. Terraces are typically built by constructing walls or embankments along the contour lines of the sloping land. This helps to create flat areas or steps that slow down water flow and prevent soil erosion. The construction of terraces involves carefully planning the layout of the walls to ensure water is directed away from the land and that the soil is held in place. It's like creating a series of mini platforms on the slope to protect the land and promote sustainable farming practices.

Cover Crops

Cover crops play a vital role in soil conservation practices. They are crops planted primarily to protect and improve the soil rather than for harvest. Cover crops help prevent soil erosion, suppress weeds, improve soil health, and increase biodiversity. When cover crops are planted during fallow periods or between cash crops, they help hold the soil in place, reducing erosion caused by wind and water. The roots of cover crops help to break up compacted soil, improve soil structure, and increase water infiltration [12]. Additionally, cover crops add organic matter to the soil as they decompose, enhancing soil fertility and microbial activity.

Integrated Pest Management

Integrated pest management (IPM) is an approach that combines various pest control methods to manage pests effectively while minimizing environmental damage [13]. In the

context of soil conservation, IPM plays a crucial role in maintaining soil health and reducing the reliance on chemical pesticides. IPM strategies in soil conservation may include using biological controls such as natural predators or parasites to manage pest populations, implementing cultural practices like crop rotation and intercropping to disrupt pest life cycles, and utilizing physical methods like traps or barriers to control pests. By integrating these different pest management techniques, farmers can effectively control pests while preserving soil health and biodiversity. IPM promotes sustainable agriculture practices by reducing the environmental impact of pest control measures and supporting the long-term productivity of agricultural land.

Composting

Composting is a valuable practice in soil conservation that involves recycling organic materials like kitchen scraps, yard waste, and crop residues to create nutrient-rich compost. Composting helps improve soil structure, increase organic matter content, and enhance soil fertility. When organic materials are composted, they break down into humus, a stable form of organic matter that provides essential nutrients for plants and improves soil structure. Adding compost to soil helps retain moisture, reduce soil erosion, improve soil structure [14] and support beneficial soil microorganisms. By incorporating compost into agricultural practices, farmers can promote sustainable soil conservation by reducing the need for synthetic fertilizers, improving soil health, and enhancing overall crop productivity. Composting is a natural and effective way to maintain and protect the health of the soil for future generations.

Agroforestry

Agroforestry is another beneficial practice in soil conservation that combines agriculture and forestry techniques to improve soil health and biodiversity. In agroforestry systems, trees or shrubs are integrated with crops or livestock to create a more sustainable and resilient farming environment[15]. By planting trees alongside crops or incorporating them into pasture lands, agroforestry helps prevent soil erosion, enhance water retention, and promote soil fertility. The roots of trees help stabilize the soil, reduce runoff, and improve soil structure. The leaf litter and organic matter produced by trees contribute to soil health and nutrient cycling. Agroforestry systems support soil conservation efforts by providing multiple benefits such as carbon sequestration, habitat for beneficial organisms, and increased biodiversity. By incorporating trees into agricultural landscapes, farmers can protect and improve soil quality while diversifying their production systems for long-term sustainability.

Organic Farming

Due to variations in soil types, terrain, and climate, there is no way to protect the fields that works everywhere. The difficulty rises when crops are grown organically, as **pesticide-based soil conservation methods are forbidden.**Crop residues, long-term crop rotations, stubble cutting, green and animal manure, pasture crops, and many more practices are all part of organic farming's arsenal for conservation of the earth. It may be beneficial, for instance, to plant fewer shelterbelts on a given field and instead reduce the frequency of tillage operations and increase the use of green manure in order to maintain a vegetation cover. Additionally, organic farming supports the health of farm workers and consumers by avoiding exposure to synthetic pesticides and promoting the consumption of food free from chemical residues. The holistic approach of organic farming aligns with the principles of soil conservation and sustainable agriculture, making it a valuable practice for preserving soil health and biodiversity.

Soil testing and nutrient management

Soil testing and nutrient management are crucial aspects of soil conservation. Soil testing involves analysing the composition of the soil to determine its nutrient levels, pH, and other important factors. By understanding the soil's characteristics, farmers can make informed decisions about fertilization and nutrient management. Nutrient management in soil conservation focuses on providing the soil with the right balance of nutrients to support plant growth while minimizing environmental impact. This can involve using organic fertilizers, crop rotation, cover crops, and other techniques to maintain soil health and fertility. By conducting regular soil tests and implementing effective nutrient management practices, farmers can improve crop yields, reduce soil erosion, and promote sustainable agriculture.

Education and awareness

Education and awareness play a vital role in promoting soil conservation practices. By educating farmers, landowners, and the general public about the importance of soil conservation, we can raise awareness about sustainable land management practices. This includes teaching people about the benefits of techniques like contour ploughing, terracing, soil testing, and nutrient management. Through workshops, training programs, educational materials, and outreach efforts, we can empower individuals to make informed decisions about land use and conservation. Increasing awareness about the impact of soil erosion, loss of soil fertility, and the benefits of preserving soil health can lead to positive changes in agricultural practices and environmental stewardship.

Conclusion

Soil conservation encompasses a range of methods and practices aimed at maintaining soil health, preventing erosion, and promoting sustainable agriculture. Techniques such as conservation tillage, crop rotation, cover crops, integrated pest management, agroforestry, composting, education and awareness, soil testing and nutrient management,and organic farming play crucial roles in preserving soil fertility, reducing soil loss, and supporting biodiversity. By implementing these strategies, it can safeguard the long-term productivity of agricultural lands, protect the environment, and ensure food security for future generations. Soil conservation is fundamental for sustainable land management and the overall well-being for the ecosystemsand mitigating the impacts of climate change.

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Role of Libraries in Sustaining Environment through eco-friendly Procedures and Services

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Abstract:

This article aims to address how libraries might become more environmentally sustainable by implementing green practices and services. Protecting the environment is crucial the widespread use and accessibility of modern technology like photocopiers, fax machines, and computer printers. Since paper is used by all of these machines. Environmental sustainability, green printing, copying, etc. are explained at the outset of this work. Further illustrates the several sustainable library strategies. Green Library initiatives in India along with examples of some libraries are also explain. It discusses the different aspects of 'Environmental Sustainability'. It shows how a library can be considered as a 'social organisation' and thus has a vital role to play in the conservation of nature.

Introduction:

The most significant source of knowledge for future generations is libraries, which have been conserving knowledge in a variety of formats, including parchment, stone inscription, leaf inscription, incunabula, and current printed form. Following that, the development of the computer in the 1950s drastically altered this situation, and new ICT applications began to appear in libraries.

With printed documents and other reading materials, libraries were environmentally friendly at the time. However, as research and publishing activities increased, space became limited, which was addressed by the use of electronic devices in libraries. There are benefits and drawbacks to any new development, and this digitalization has a negative impact on the environment because it uses delicate electronic devices that could harm the ecosystem. The improvement of the environment requires the digital library to develop sustainably. Currently, every industry, institution, government agency, and non-governmental group is working to address this issue. In order to preserve the environment, libraries have also adopted green methods.

Overall, the emergence of the 'Green Library Movement' started in the early 1990s and is gradually becoming more recognized in the library and information science industry. Numerous library professionals are focused on developing a green library that will utilize natural and local construction materials, decrease water and energy consumption, and incorporate eco-friendly technology.

Elements of Green Architecture

Green architecture does not rely on one specific characteristic of a building. If integration is not done early in the planning stages, redundancies may occur, resulting in the loss of many benefits of sustainable design. Good sustainable design always makes use of the interconnected relationships that form between the different design elements. LEED (Leadership in Energy and Environmental Design) categorizes these elements into five different groups. Architectural designs can be created to support each other in promoting effective and eco-friendly practices. A green and sustainable library is one that takes into account environmental, economic and social sustainability. Green and sustainable libraries can be of any size, but they should have a clear sustainability agenda that includes:

- Choice of site
- Sustainable Library Services
- Maintenance of water
- Stuff of Structure
- Attribute of Household Air

Green Library

There is no universally accepted definition of green library. According to the Online Dictionary for Library and Information Science, ODLIS (the Green Libraries are "designed to minimize negative impact on the natural environment and the maximize indoor environmental quality by means of careful site selection, the use of natural construction materials like nature and biodegradable products, conservation of resources (water, paper, solar, and energy), and responsible waste disposal (recycling, etc.)"

Present environments are endangered by climate change and other threats including social inequalities. All organizations should strive to protect the environment through sustainable development. This includes all kinds of libraries, which can play an active and significant role in sustainable development

Green Library initiatives in India

According to the Online Dictionary of Library and Information Science (ODLIS),"Green library or sustainable library is defined as a library designed to minimise negative impact on the natural environment and maximise indoor environmental quality by means of careful site selection, use of natural construction materials and biodegradable products, conservation of sources like water, energy, paper and responsible waste disposal recycling etc.

Karnataka University Library	Dharwad	a green space, student can sit under the trees, they can take books from the library for study.
Mumbai University Library	Mumbai	The library use wood as stack materials, large size of windows add for ventilation and penetration of sunlight in reading hall
Anna Centenary Library	Chennai	The library is well equipping with modern technology and proper use light, air and wood. It is reputed green libraries in India which is gold rating by LEED.
Delhi University Library	Delhi	The building would be naturally cool and pleasant
Calcutta University Library	Kolkata	All readings room is so large and vast open areas, and thick walls.
NIT Library	Silchar	The New Library Building under construction is designed according to LEED certification system for developing green libraries (Barak Valley).
Perma Karpo Library	Ladakh	Solar panels and green area surrounded by white lotus garden.

Some examples:

Perma Karpo Library Ladakh

Karnataka University Library

NIT Library Silchar

LIBRARY SERVICES TO HELP ENVIRONMENT SUSTAINABILITY

Reading room:
There should be enough windows, glass windows, and skylights in a library so that natural light can flood the space and eliminate the need for artificial lighting during the day. Additionally, installing energy-efficient lights and bulbs in places that aren't used for reading at night indirectly benefits libraries economically and conserves electricity.

Digital Collection:
Using digital ebooks instead of print is in line with sustainable practices. Libraries help preserve natural resources and lessen their ecological footprint by adopting a digital-first philosophy and lowering the demand for paper and ink. This entails investing in and creating digital content internally (e.g., e-books, e-journals, photos, videos, etc.), giving preference to digital content that is not subject to Digital Rights Management (DRM), and switching to hybrid or online delivery methods for library services.

Environment Literacy
Organize environmental reading clubs, eco-friendly workshops, and guest lecturers who may inform and motivate customers to live more sustainably. Think about collaborating on projects with nearby environmental organizations.

Donations can help reduce waste

Public libraries organize drives for books, clothing, and toys, enabling individuals to give away gently used items to benefit the community. These initiatives are beneficial for families in need and contribute to waste reduction by finding new homes for old items.

Conclusion

The idea of a "green library" is rapidly gaining traction, and some tangible actions have already been implemented nationally. In the context of contemporary library services and open space education, the idea of creating "green libraries" is still relatively new. There is still much work and effort needed on the part of libraries, educational institutions, parent organizations, etc., to be dedicated to minimizing the environmental impact of libraries and greening them.

The library is constantly dealing with issues like funding and space and the volumes require special attention because of dust, dampness, and fungus. A contemporary library that uses less electricity is known as a "green library" or "sustainable library" optimal utilization of renewable resources, such as sunlight, air, and forests. These days, libraries must do much more to make their spaces greener. To create a green library, the librarians need to make several choices. Participate in the green library movement as well. The creation of the green library is being aided by numerous national and international organizations. The government ought to support green libraries and provide guidance to all libraries on how to create them.

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