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ECO-RESTORATION: A POWERFUL TOOL TO COMBAT CLIMATE CHANGE

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Abstract

'Development' has become the most important aspect of today's world. A race to compete against other countries, states, cities even among neighbours. The competition is to become more technologically advanced and to have the best infrastructure possible. Financial and natural resources are regarded as critical indicators in the present era of globalisation, as these factors help to stimulate economic progress. What people are unable to gauge is that the guise of "rapid growth or development" is a curtain hiding the loss of earth's natural resources causing damage to ecosystems, and worsening the adverse impacts of climate change.

Wasteland reclamation and eco-restoration have been recognised as effective tools to achieve sustainability and are collectively taken up by governments, businesses, the public, academicians, conservationists, and ecologists. United Nations has declared the decade 2021-2030 as that of ecosystem restoration, to minimise the adverse impacts of industrialisation on productive land. Sustainable corporates have utilised the potential of eco-restoration and conservation of local natural resources towards the concept of business continuity. The importance of wetland ecosystem conservation is highlighted with emphasis on the wetlands of Kerala and the man-made wetland of Yamuna Biodiversity Park, Delhi, India. The present discussion is useful in developing a dialogue for sustainable developmental policy structures and understanding ecological implications.

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I. Introduction

Biological diversity forms an important link among the natural resources. Human population growth rate and wasteful consumerism are causing excessive exploitation of natural resources. (Ramakrishnan, 2001). United Nation's Decade on Ecosystem Restoration (2021-2030) is a sustainable initiative indicating healthier ecosystem growth by conserving habitat at soil and water-bodies, eventually restoring life and livelihoods. In the present scenario of urbanisation, there is tremendous scope for re-vegetating the degraded ecosystems back to their normal state (Waring, 2024; Agarwal & Gupta, 2022). Natural Resources are the source of raw materials for any of the business chains. Employee productivity is also dependent on goods and services being provided. Businesses have realised the importance of utilisation of Corporate Social Responsibility funds for the conservation of natural resources. Climate change can never be tackled without addressing the global issue of overpopulation. United Nations collects data to calculate pressure on ecosystems and nature's carrying capacity (Moudgil, 2016). India's leading global theme 'One Earth One Family One Future' of the G20 event towards combatting global climate change and developing a resilient future, encouraging everyone to become 'agents of change' emphasised the need for adopting sustainable businesses as well as sustainable lifestyles (Zhentao et al, 2023).

International Sustainable Framework

International communities need to work towards mobilising financial investments to aim for 2030 emission targets that will reflect net zero emissions by 2050. Collective efforts are required on these targets, countries will need to curtail coal utilisation and deforestation and promote investments in the non-conventional energy sector, along with eco-restoration and disaster management. Resilient infrastructure and communities can further reduce the challenges of the climate crisis, securing the global net zero target. The series of Conference of Parties events are discussed below to depict acceleration to combat climate change by initiating collaborations. At COP14, India committed to United Nations Convention to Combat

Desertification (UNCCD) to restore its 26 million hectares (MHa) of degraded land by 2030. The COP15, which was held in Copenhagen in 2009, led to the establishment of the Green Climate Fund. It was officially launched during COP16 and therefore, by 2014, the fund was active. However, the fund was overlooked by UNFCCC. It set itself an aspiring target to channel the US $100 billion from 2020 onward. The Paris Agreement emphasised the importance of climate fund in the 9 points of the Article 9 of the agreement. In Copenhagen, the world also agreed to deliver to $30 billion to the Least Developed Countries also known as Fast Start Finance. In COP26, the commitment to Global Funding Mechanism towards greener technologies and eco-restoration settled as a dialogue (Evans et al., 2021). Though it did not achieve much of a success, COP24 managed to get climate finance going. In 2009, it was agreed that the Copenhagen Green Climate Fund shall be established to support the LDCs to control climate change by reducing greenhouse gas emissions. It was agreed that US$100 billion would be utilised for many projects in Africa, Vietnam and Bangladesh. In 2010, the 'Fast Start Finance' was initiated. The agenda for COP24 was set to attain money for climate action by considering the questions of finance allocation, policy-making, and others. The smart city Songdo is to be built by 2022 where the garbage is directly sucked from homes by pneumatic rubber chutes to generate electricity. The Paris Rulebook, whose role was to facilitate the implementation of climate action commitments as well as to ensure compliance, had to set the Paris Agreement in motion at COP24. The COP24 took place from 2nd to 14th December 2018 in Katowice, Poland. The main objective was to adopt the full implementation of the agreement. Negotiations were difficult and involved realpolitik, which is diplomacy based on power. Realpolitik resulted in the failure COP15, however, it led COP24 to success, and thus, COP24 accomplished the Katowice Climate Package. The basis of the Paris Agreement was the climate action committees which were enforced by the COP24. Under nder President Michal Kurtyka, the Katowice Rules were agreed upon to facilitate the full implementation of the agreement by determining systematic solutions for each country. COP24 became a showcase of realpolitik—politics driven by power and material factors. The combination of science and realpolitik often fails to produce substantive action, leaving politicians caught between political and ecological suicide. Negotiators must accept the reality, acknowledge the self-interested nature of states, accept incremental change, and act strategically. The conclusion of COP24 saw global consensus on the Katowice Climate

Package, which established guidelines aimed at operationalising the transparency framework. According to the Food and Agriculture Organization of the UN, the global food system is at crossroads. Agroecology, a concept based on the application of ecological processes to the agriculture production system does not enjoy global support, however, it enhances biodiversity. The principles of agroecology are not new to British India, where traditional farming practices emphasised ecological harmony, crop diversity, and sustainable resource management. COP25 played a crucial role in agriculture. Agriculture provides food security which is essential for humans. Additionally, agricultural practices influence climate change while also being affected by its impacts. (Wamsler et al., 2020). The Intergovernmental Panel on Climate Change (IPCC) catered to desertification, land degradation, deforestation, and land use which are adversely affecting climate. The wide use of fertilisers has created havoc on aquatic species. There's a need for sustainable food systems and agroecology offers a solution by applying ecological principles. This approach optimises interactions among organisms, resulting in increased production while enhancing biodiversity. Agricultural robotics is another emerging field for sustainable agriculture. In 2015, a major survey was done which declared that there is a global consensus that climate change is a significant challenge. Global climate change has now got intertwined with global politics hence an immediate and meaningful climate action is the need of the hour. At COP23, the UN touched on the topic of climate engineering which is an emerging interdisciplinary field with major consequences Biotechnology based on climate solutions were introduced in the form of artificial photosynthesis with artificial trees. However, they require a large amount of area. The use of biotechnology has also helped us to get food in difficult conditions. Climate startups are increasing all across the world which are worth billions and this was discussed in COP25. COP27 was held in Egypt from 6th November to 20th November, 2022. The most important breakthrough of this summit was the 'loss and damage fund', which was set up to compensate lower-income countries for damages that they face from climate change such as flooded lands and destroyed homes (UNFCCC, 2022). This was particularly important in light of the recent floods seen in Pakistan. The role of agriculture in climate change received unprecedented attention in this summit. Reforming agriculture and food systems–currently responsible for one-third of all greenhouse gas emissions–will be essential to achieving the global goal of limiting warming to below 1.5 degrees. The Tree-Based Food System Transformation for Improving Lives and The Environment session, held

at the India Pavilion laid special emphasis on the principle of the Right Place, Right Tree, and Right Reason, which should necessarily be kept in mind while doing eco-restoration. In such cases, it is vital to know what species are to be planted in what region, and at what density as hyper-dense plantations end up damaging the ecological balance. The Food Systems Pavilion, in its session on 16th November, 2022 discussed the issue of the harmful trickle-down effects on human health and well-being from the cataclysmic consequences of climate change, biodiversity loss and ecological degradation. As the UNCCD recognises, food supply disruptions are parallel to food insecurity and land degradation indicating the importance of eco-restoration. It is important to undo the threats to biodiversity, soil, water and the remaining ecosystem services because this will provide two-fold benefits, to the planet and to the people. However, ecological restoration cannot be implemented or planned without meaningful global partnerships. The major disappointment to the conference was that no legal binding agreement could be finalised towards limited or sustainable or green technology-based use of fossil fuels, which is a catastrophe to ecological balance. COP28, held in the UAE from November 30th to December 12th, 2023 included the World Climate Action Summit, which involved international dialogues for the Green Funding Mechanism towards Climate Change Resilience (UNFCCC, 2023). The different stakeholders including states, businesses, local people, youth & communities and civil society plan to discuss the progressive policy document and investment to accelerate global climate action across all the pillars of the Paris Agreement. Empowerment of the youth, children, education and skills meeting in COP28 seek to empower society towards green future while addressing climate change. Focus is on developing international Green Financing mechanisms co-designed with emphasis of the conservation of culture and traditional framework to sustainably manage natural carbon sinks and biodiversity hotspots. Finding a sustainable option to reduce the pressure on land resource, agri-food and water systems is the course of COP28, well aligned with eco-restoration and climate change resilience. The role of youth in demanding climate change leadership to transform conventional systems towards sustainability is the need of the present hour. The role of environmental education is important. Integration of circular economy-based actions for sustainable resource management is centralised as “Closing the Loop: Empowering Climate Action” fostering innovative approaches to sustainable resource management.

II. Natural Resource Management

The sustainable management of resources ensures long-term assurance of ecosystem services. Communities of organisms mutually interact to maintain homeostasis. Sustainability is the underlying concept upon which natural resource management is based. In India, the diversity of flora and wildlife enriches the wetland ecology considerably. India's wetlands supply ecological services and thereby goods to a larger population. The area of wetlands has been shrinking as a result of rapid urbanisation, industrialisation, and agricultural expansion. However, in recent years, wetlands management and protection have received hype because of their importance in ecology and economic development (Uttara et al., 2012).

Ramsar Convention

Sundarban is the largest wetland area in India, with 423,000 hectares (ha), and is a UNESCO World Heritage Site that provides livelihood to thousands of villages. Vembanad-Kol Wetland (151,250 ha), Chilka Wetland (116,500 ha), Kolleru Lake (90,100 ha), and Bhitarkanika Mangrove (65,000 ha) are the next four largest wetlands in India.

Since the nineteenth century, wetlands have been designated as Ramsar sites in India, with the highest period of designations (49%) between 2002 and 2012, indicating an era when the wetland's conservation and sustainable growth were prioritised. The beginning of the global water crisis occurred during this period. The classification (ha) of the 49 wetland regions has also been demarcated into four categories: 1000, 1001–25,000, 250,001–50,000, and > 50,000. Most wetlands are located in areas ranging from 1001 to 25,000 hectares. Climate change has resulted in increased drought intensity, which further caused the shrinking of wetlands in recent years, resulting in the drying of surface water bodies (Alikhani et al., 2021).

The wetland’s importance as a natural habitat for migratory birds and endangered animal species is one of the main grounds for their Ramsar designation. Many Ramsar sites in India have seen a significant drop in the number of bird species due to increased environmental pollution, siltation, and disruptive anthropogenic developmental activities. Construction of dams and barrages without the stringent and comprehensive compliance of Environmental Impact Assessment studies is one of the main reasons for the continuous deterioration of many

Ramsar sites in India (Xu, et. al., 1999). The majority of Ramsar sites are near rivers, making them an important aspect of the river ecosystem. Dams have long been known to have a negative influence on rivers' aquatic life and the populations that rely on them. Despite this, numerous man-made reservoirs have been designated as Ramsar sites by the Convention. The sustainable development strategy involves the protection of wetland ecosystems and ecologically rich ecosystems which are the pillars of social and economic growth for a very long passage of time.

The Ramsar Convention strongly recognises the legal rights of fishing communities and indicates a sustainable management framework so that the livelihood of traditional people, and local fisher folks are always prioritised (Bhattacharya et al., 2012). However, due to the impact of urbanisation, the connection between local people and wetlands has been adversely impacted, and due to commercial fishing, species richness of fish and the number in the wetlands have reduced. Chemicals employed in the commercial fishing process adversely impact the biodiversity of aquatic ecosystems. The wetlands' importance as a home for migratory birds and endangered animal species is one of the main grounds for their Ramsar designation. Most Ramsar sites in India have seen a significant drop in the number of bird species due to increased pollution loads, siltation, and disruptive human activities. The Ramsar wetlands in India are also under threat from climate change. Unpredictable rainfall, landslides, cloud bursts, and flash floods are taking a toll on the hills' lakes. Drought has been having a negative effect on the inland wetlands, resulting in periodic dry spells. Cyclonic storms, which are becoming more frequent and severe, are wreaking havoc on coastal wetlands. Reduction in tourism and related adventure-seeking expeditions is most obvious owing to climate change issues. While rising human development demands, the destruction of mangroves, and deforestation have exacerbated the situation, there is a need for comprehensive preparatory or remedial action plans (Das, 2022). Tourist footfall and disruptive adventure-seeking expeditions are expanding near Ramsar Lake areas, exposing the lake-based environment and local residents to unknown changes and new issues. The wetlands' importance as a home for migratory birds and endangered animal species is one of the main grounds for their Ramsar designation (Ramsar Sites Information Service, 2020). Most Ramsar sites in India have seen a significant drop in the number of bird species due to increased pollution loads, siltation, and

disruptive human activities. Dams and barrages built without credible impact studies, options evaluations, or democratic decision-making, as well as their defective operation, are some of the main reasons for the continued degradation of many Ramsar sites in India. The majority of Ramsar sites are near rivers, making them an important aspect of the river ecosystem. Dams have long been known to have a negative influence on rivers' aquatic life and the populations that rely on them. Despite this, numerous man-made reservoirs have been designated as Ramsar sites by the Convention. It's ironic that the central and state governments, which are supposed to protect critical wetlands resources, are pushing harmful development projects that are wreaking havoc on the Ramsar wetlands (RSIS, 2021).

Even though the Ramsar Convention recognises fishing communities' rights and allows for sustainable management of wetlands to provide livelihood opportunities to dependent people, traditional fisherfolks have been continuously adversely affected and their rights have been ignored, disrupting their income and connection to wetlands. Simultaneously, commercial fishing has reduced the richness and quantity of fish species found in many Ramsar wetlands, with no meaningful interventions by the relevant authorities. Invasive species are preferred over native species in commercial fishing (Barman et al., 2013). Traditional and cultural knowledge-base is a step towards self-sustenance of respective ecosystems. Water is pumped from the wetlands or diverted from streams that feed the wetlands. Some chemicals are employed in the process, and effluents are released back into the wetlands before the fish ponds are refilled. The Ramsar wetlands in India are also under threat from climate change. Unpredictable rainfall, landslides, cloud bursts, and flash floods are taking a toll on the hills' lakes. Drought has been having a negative effect on the inland wetlands, resulting in periodic dry spells. Cyclonic storms, which are becoming more frequent and severe, are wreaking havoc on coastal wetlands (Biswas et al., 2022).

III. Eco-Restoration of Wetlands

Urbanisation and exponential population growth with subsequent pressure on natural resources increase habitat fragmentation of various aquatic and terrestrial ecosystems. Due to this, traditional land management systems have been adversely impacted, and a significant percentage of arable land is continuously decreasing (FAO-UNEP, 1997). Many countries

including India are reviving Sustainable Agriculture. Under the revival framework, ecosystem restoration projects are very important because they bring the wasteland and degraded ecosystems back to their natural revegetated state, strengthening ecological interactions, and thereby providing habitat to various species. The Ramsar wetlands in India are also under threat from climate change. Unpredictable rainfall, landslides, cloud bursts, and flash floods are taking a toll on the hills' lakes. Drought has consistently harmed the inland wetlands, resulting in periodic dry spells. Cyclonic storms, which are becoming more frequent and severe, are wreaking havoc on coastal wetlands (Yepsen et al., 2016). Since the nineteenth century, priority conservation wetlands have been designated as Ramsar sites in India. Because of climate change, increased drought intensity, and increased unsustainable tourism with adventure-based activities, the areas under wetlands are declining. This further aggravates the pressure on ecosystems due to the exponentially increasing global population.

Yamuna Biodiversity Park: An Eco-Restoration Project of Degraded Wetland Ecosystems

Delhi has lost its native forests, flood plains of the Yamuna River, and wetlands due to urbanisation, excessive exploitation of natural resources, habitat destruction, pollution, and biological invasions. In the urban area, the Yamuna River is extremely polluted. Biodiversity parks is a concept successfully implemented by an eminent Prof. C. R. Babu, University of Delhi, to ensure the eco-restoration of such degraded ecosystems, so that the ecosystem can support a variety of life forms. These are unique landforms that ensure eco-conservation and educational and cultural values to enhance the quality of the environment which eventually sustains urban centers. Thus, they help combat climate change, promote ecotourism, and create livelihood opportunities for the local communities. Ecotourism is a branch of tourism that directs tourists to adopt environmentally responsible behaviour during travel in a manner that they understand and appreciate the productivity of nature and cause very low or negative environmental impacts on the biologically rich ecosystem (IUCN). The Biodiversity Park has followed a similar idea of restricted and guided forest walks to prevent adverse impacts on biodiversity. Delhi Development Authority and the University of Delhi have facilitated eco-restoration projects aimed at achieving the United Nations 15th Sustainable Development Goal: 'Life on Land'. The objectives of the parks are the conservation of important ecosystems in

Delhi, the river Yamuna, and the Aravalli hills by facilitating nature's prudential eco-restoration processes to enhance their wide range of natural habitats. This automatically conserves keystone and other threatened species, establishes field gene banks of threatened and wild genetic resources, and promotes environmental education and ecotourism. The wetlands sustain the rich aquatic flora and fauna of the Yamuna, recharge groundwater, and prevent floods (Zedan, 2012).

The Yamuna Biodiversity Park, which was earlier the wasteland on an inactive floodplain of the Yamuna River, spreads near Wazirabad village on the flat alluvial plains of the Yamuna. The area covered is approximately 457 acres. The Park now comprises native flora and fauna which used to grow in ancient times. Previously, the soil pH was 10 and supported no vegetation. However, with the introduction of *Leptochoal Fusca* and other salt-loving grasses, the pH of the soil was gradually altered from 10 to 7. Afterward, cow dung was added to the soil when the soil pH became neutral. Thereafter, they planted saplings of various native plant species that used to grow naturally in the region 100 years ago but had become extinct locally. The Biodiversity Park represents Delhi's natural heritage and rich biological diversity is acting as a tool to promote environmental education among school and college students. Two wetlands, grassland, and forest ecosystems were restored under this project (Figure. 1). The native tree species such as Babool, Khirni, Jamun, Imli, Kaith, Bael, etc. were planted. The park is a habitat for 75 species of butterflies, 200 species of birds, 10 species of snakes, 900 species of plants, and big mammals like porcupines, civets, and wild boars. A leopard, the top carnivore has also been to the park in 2016. After many days of his stay in the park, the leopard was later shifted to the forest area due to pressure from local villages which also exhibits an example of man-wildlife conflict. Phase two of the park is 300 acres of active floodplain and is currently in the development stage (Figure Two).

The fruit-bearing plant conservatory is a precious reservoir of wild genetic resources. Species of birds are found enjoying in this area. A few important such plants are Khirni (*Manilkarahexandra*), Kaith/Elephant Apple (*Limonia acidissima*), Cheeku/Sapota (*Manilkarazapota*), Pomegranate and Khajoor/Date (*Phoenix dactylifera*). There are various other fruit-bearing trees and shrubs including Falsa (*Grewia asiatica*), Jamun (*Syzygium cumini*), Goolar (*Ficus racemosa*) and Baer *(Ziziphus mauritiana).* A butterfly conservatory

with flowering and respective host plants has also been established to attract the most important pollinators of nature. It ensures the healthy growth life cycle of butterflies. Two small water-lily ponds have also been developed which butterflies can use to absorb essential minerals by the process of mud-puddling. Conservatory for medicinal plants also ensures a wider gene pool. A fun activity that reveals the presence of many creatures in the park is examining animal footprints and pug marks. Thousands of migrating birds from Siberia, Central Asia, and Europe have been drawn to the vast wetland that has been created, which also serves as a refuge for many permanent species. 500 million gallons of floodwater can be stored there, replenishing the groundwater and reducing flood risk (Ramachandra et al., 2012). Aravalli Biodiversity Park, Northern Ridge (also known as the Kamla Nehru Ridge), Neela Hauz Biodiversity Park near Jawaharlal Nehru University, Sanjay Van, and other degraded sites in Delhi are currently undergoing eco-restoration. The Aravalli Biodiversity Park has started the process of restoring the common house sparrow's habitat as part of its ongoing eco-restoration efforts. Sparrow Conservatory is a creative move that welcomes this tiny bird.

The seven-acre, environmentally restored marsh is 7 to 15 feet deep. Submerged, floating, and emergent vegetation are all visible in this marsh. For both migratory and local birds, it serves as an appropriate habitat. According to Leys and Vanclay (2011), this wetland offers a variety of emergent, submerged, and floating terrestrial and aquatic species. The Yamuna Biodiversity Park in Delhi has been the breeding ground for the Oriental Darter.

Figure 1: The man-made wetland at Yamuna Biodiversity Park

Source: Photograph is clicked by author; Acknowledgement: DDA Yamuna Biodiversity Park

Figure 2: Top carnivore roaming in Yamuna Biodiversity Park in 2016

Source: DDA Yamuna Biodiversity Park (Picture captured on their CCTV camera)

Anhinga melanogaster since 2006. A study was conducted in 2011 to determine the Oriental Darter's success rate in laying eggs in the park. Eight of the nine incubated nests (88.88%) produced successful hatchlings, and one nest was abandoned three weeks after it was first placed.

Wetlands of Kerala

Kerala is famed for its wetlands and is one of India's greenest states. Kerala has over 217 wetland ranges, which account for around one-fifth of the state's total land area of 38864 km^2. Marshy and waterlogged areas, huge polders (paddy agricultural areas) connected with backwaters, lakes, and the Myristica Swamps in the Western Ghat forests are among Kerala's unique wetland habitats. Some of the Kerala Ramsar sites are lakes of Vembanad – Kole, Ashtamudi, and Sasthamcotta (Jayakumar & Chackacherry, 2011). Professor Madhav Gadgil's elaborative report emphasising the importance of conservation specially for the biologically rich and fragile ecosystems of Kerela indicated the tremendous threat posed on wetlands, caused by unsustainable developmental activities such as eutrophication, discharge of waste water, encroachment, mining, and deforestation (Kokkal et al., 2008).

The aesthetic value of Thiruvananthapuram's Vellayani Kayal's zones has deteriorated due to unsustainable waste disposal activities. Beyond these issues, what many have failed to recognise is that wetlands, which appear to be a burden in terms of having to conserve, could

turn out to be a valuable asset in the future, with India's chances of scaling high in the field of Local Ecotourism being exceedingly high. India is a subcontinent with naturally occurring scenic sites that are one of a kind, owing to its diverse topography. Grasping that vital thread and developing on it is a work that should be undertaken by both the government and the locals. Wetlands contribute towards the local economy, building the ecosystem's homeostasis. That is how economy and ecology run hand-in-hand.

Wetland degradation is becoming more of a problem due to the irreversible loss of vital ecological and economic assets. The importance of biodiversity in supporting the wetland system and its resilience is underestimated; nonetheless, the benefits provided by many wetland systems to humankind are enormous. It is important to restore and protect the wetland ecosystems that are deteriorating at a fast pace. Natural and nature-based solutions (NNBS) refer to the restoration or enhancement of natural ecosystems using various approaches to benefit both wildlife and human communities (George, 2021). The use of NNBS as a defence against coastal storms and sea-level rise has risen in importance. Community participation in planning and decision-making at all levels, as well as local vigilantism with the involvement of local governments and non-governmental organisations, may aid in the effective management of the wetland ecosystem.

Collaborative approach for individual, academic, institutional, and government research should be encouraged for private and public sectors to monitor, manage, and restore wetlands, as well as raise public awareness for activities that benefit both the environment and society. Executing nature-based solutions with the support of academics, ecologists, researchers, stakeholders, famous dignitaries, and local authorities to address the severe environmental, economic, and social issues resulting from big challenges such as climate change should be undertaken. Wetlands should be managed sustainably by involving individuals and other relevant stakeholders, as well as raising public awareness about the importance of wetlands and the ecosystem services and benefits they provide. All present and potential wetlands should be evaluated economically to determine their economic benefits as well as the ecosystem and environmental services they provide (Xu et al., 2019).

Ecotourism is getting to be amazingly prevalent among city-living individuals around the world. As the awareness concerning the hurtful impacts of different electronic contraptions and

present-day ways of life is spreading the characteristic way of natural living is becoming prevalent for its incredibly advantageous impact on our well-being and living. Eco-tourism is picking up one of the foremost prevalent sorts of tourism as in this kind of tourism the traveller is gathered to encounter the local way of life and our servitude to a way of living that is encompassed by the common circumstances and continually being in touch with the powers of nature. Comprehensive orientation programs can be arranged for tourists so that those who are not directly dependent on the ecosystem should not over-exploit and pollute the ecosystem. The revenue generated from local eco-tourism of these wetlands can in turn be used to help conserve them, policies, programs, and various projects will be able to come into light as more and more people visit these places and this is where the role of educational institutions as well as NGOs comes in. There should be involvement of the local community towards ecosystem restoration and livelihood generation from the ecosystem. This can be done by promoting small-scale livelihoods based on eco-based products in a sustainable manner and utilising the traditional knowledge of local communities (Waring, 2024). This leads to the dual effect of the increase in contribution to the GDP of the economy as well as the creation of self-sustaining eco-restoration mechanisms and climate change resilience.

Awareness regarding sustainable development and environmental protection should be inculcated into the curriculum at a very early stage which helps an individual become ecologically sensitive and conscious, much like they are of counting numbers and alphabets. This helps in inclining the future generation towards a greener industry and creating newer jobs in the sector of eco-tourism, adding to the development of our country. NGOs need to reach places where the government is unable to since the initiative to educate the less-privileged about wetland conservation as well as other environmental threats is extremely important because locals play the role of the biggest game-changers in the growth of eco-tourism. They are the ones who need to take part in the protection of nature surrounding them and this also will help them as tourism increases the number of jobs, following this expansion will benefit them the most. This will take the form of a positive cycle and address various issues that India faced as a nation, where it was unable to work out much towards the eco-tourism sector since the resource allocation had to be focused on much bigger problems which were to help fill the gaps left by years of oppression and colonial rule (Leys & Vanclay, 2011).

IV. Conclusion

People's participatory approach-based camps involving experts, leaders, and the public need to be organised. The objective is to ensure the participation of one million people coming together by 2030 to revegetate degraded landscapes. Local living labs are initiated so that traditional knowledge bases can be utilised, innovated, and refined so that the global ecological benefits can be reaped. The first such camp was initiated in Spain in 2016. Such camps are also utilised for environmental education. People are subtly motivated towards innovative healing of the ecosystem rather than being exploited at a faster rate. It fulfils the 15^{TH}, $16^{TH,}$ and 17^{TH} SDGs being developed by the United Nations. Ecosystem restoration is an effective tool for sustainable development that needs to be implemented by international collaborations. Green Budgeting, Loss and Damage Funds, Green Skills and Businesses, and Entrepreneurship with emphasis on nature-based solutions form a basis for further scope for research for effective planning and implementation.

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