ISSN: 2395-7852

International Journal of Advanced Research in Arts, Science, Engineering & Management

Volume 12, Issue 5, September – October 2025

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.028

+91 9940572462 +91 9940572462 ijarasem@gmail.com www.ijarasem.com

International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| ISSN: 2395-7852 | www.ijarasem.com | Impact Factor: 8.028 | Bimonthly, Peer Reviewed & Refereed Journal|

| Volume 12, Issue 5, September - October 2025 |

Environmental Economics and Sustainable Development: An Analytical Study of Current Status and Emerging Challenges

Ratan Lal[1], Prof. (Dr.) Vijay Kumar Ari[2]

Research Scholar, Department of Economics, Govt. Dungar College, Bikaner, India[1]

Rtd. Principal, Govt. P.G. College, Sri Dungargarh, Bikaner, India[2]

ABSTRACT: Environmental economics has emerged as a vital discipline in addressing the pressing challenges of resource depletion, environmental degradation, and climate change in the contemporary world. At the same time, sustainable development has gained prominence as a guiding framework to balance economic growth with ecological integrity and social equity. The convergence of these two domains reflects the need to integrate economic decision-making with environmental responsibility to ensure long-term well-being for present and future generations. Therefore, the present paper aims to analyse the current status of environmental economics in relation to sustainable development and to identify the key challenges that hinder their effective integration.

KEYWORDS: Environmental Economics; Sustainable Development; Growth; Challenges.

I. INTRODUCTION

Uncontrolled economic growth that relies on unlimited use of natural resources eventually creates barriers to further progress. As environmental problems intensify, the fragile balance of the biosphere is disturbed, often resulting in unpredictable consequences such as climate change. These environmental challenges also give rise to serious social and economic problems that demand urgent solutions. At the same time, it is becoming increasingly difficult to separate the effects of social and environmental factors in the current global changes (Daukaev et al., 2019). The warnings of countries that have already faced environmental crises and recognize the urgent need to rebuild the relationship between humans and nature have been only partially addressed, if at all. As a result, both natural and social disturbances caused by irresponsible human activities have become a common reality of modern life. Maintaining a healthy environment in heavily populated regions requires continuous monitoring. Environmental awareness is progressively transforming from a humanitarian endeavor towards nature into a fundamental criterion for human existence. This recognition has resulted in the integration of environmental concerns into political discourse and the establishment of the principles of a new development paradigm (Apokin and Belousov, 2009).

The urgency of guiding future development compelled the United Nations (UN) to place sustainability at the forefront of its global agenda. Over time, the accumulated experience in this field has yielded valuable insights that now underpin the principles of modern sustainable development. These insights emphasize not only the gravity of environmental degradation but also the challenges of meeting environmental standards without simultaneously addressing pressing socio-economic issues. They also highlight the critical role of civil society in shaping sustainable practices. Sustainable development represents one of humanity's earliest comprehensive efforts to align social progress with environmental stewardship. It encompasses both socio-economic and ecological objectives, underscoring the need to balance rising human demands with the planet's finite resources, while safeguarding the interests of future generations. The contemporary interpretation of sustainable development reflects political foresight, recognizing opportunities to integrate environmental responsibility into the fundamental processes of economic growth. This "win–win" approach requires that all development initiatives undergo thorough social and environmental assessments. In modern political discourse, sustainability is often framed as a necessary adjustment for developed economies and, conversely, as a potential avenue of opportunity for developing nations, particularly those with abundant natural resources (Kurbanov et al., 2023).

Despite its significance, there remains a notable gap in the literature: few studies have systematically examined the interrelationship between environmental economics and sustainable development or explored the practical challenges and implications of implementing environmental economic strategies. In view of this, the present study seeks to fill this gap by offering a comprehensive analysis of how environmental economics can contribute to sustainable development while also addressing the emerging obstacles in this evolving field.

II. ENVIRONMENTAL ECONOMICS WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT

Environmental economics is the examination of the management of environmental resources via economic principles. Environmental economics is informed by both microeconomic and macroeconomic viewpoints, with a greater emphasis on microeconomics. It mainly investigates the rationale and mechanisms behind human decision-making that impacts the natural environment. It also assesses how economic frameworks and regulations should be modified to align environmental consequences more closely with human preferences and ecological requirements (Field and Field, 2017). Moreover, economists in this domain characterize sustainable development as progress that safeguards capital for future generations, with capital encompassing total human capital (skills, knowledge, and technology), manufactured capital such as machinery and structures, and natural capital (environmental resources). Some environmental economists contend that only scarce environmental resources warrant protection, while others assert that environmental treatment should address issues that indirectly concern individuals due to their influence on the production of other commodities that are (1) scarce, (2) not available in markets, and (3) affected by the actions of others (Sagoff, 2012). This suggests that individuals are predisposed to safeguard environmental resources due to their personal benefits, indicating that human instincts may influence environmental economic dynamics (Lélé, 1991). The human–environment interaction is characterized by the consensus that most environmental issues stem from human activities that induce enduring ecological alterations, including biodiversity loss and freshwater scarcity. Consequently, minimizing human activities may be the most efficacious strategy to mitigate environmental issues and augment the resource base (Venkatachalam, 2007). Conversely, human activities are vital for economic development (Kahneman and Knetsch, 1992).

As environmental economics attracts increasing attention from governments and economists, the global community has also been exposed to the Sustainable Development Goals (SDGs). The SDGs are organized by the United Nations to facilitate global participation in establishing a framework for attaining development that harmonizes social, economic, and environmental sustainability (Sachs, 2012). The SDGs provide an interdependent framework of quantifiable objectives aimed at tackling interconnected difficulties and attaining global sustainable development, while also delineating the sustainability trajectory through 2030 (Mio et al., 2020). Figure 1 represents the concept of sustainable development by highlighting the interconnection between three major dimensions: environmental, social, and economic. The environmental aspect emphasizes the importance of maintaining a viable natural environment through the conservation of ecosystems, biodiversity, and resources for future generations. The social aspect reflects the role of a nurturing community, focusing on human well-being, equity, justice, healthcare, education, and cultural values as essential components of sustainability. The economic aspect stresses the need for a sufficient economy that promotes growth, stability, and livelihoods without overexploiting natural resources. At the center, where all three dimensions converge, lies sustainable development, which can only be achieved when environmental protection, social well-being, and economic prosperity are balanced and integrated. This holistic approach demonstrates that true sustainability requires harmony between nature, people, and the economy, ensuring that present needs are met without compromising the ability of future generations to fulfill their own.

Fig 1: Relationship between environmental economics and sustainable development

Source: Sadiku et al. (2019)

Nevertheless, the journey toward realizing environmental economics and the sustainable development objectives may not be straightforward. Environmental issues are escalating in severity, and the remedies proposed by environmental economics have shown ineffectiveness (Beder, 2011). The application of environmental economics techniques results in many economic and social effects. The emergence of the "shadow economy" is attributed to ineffective fiscal policies (Biswas et al., 2012). In Asian nations, the average proportion of the "shadow economy" has reached around 31% of the official GDP. Over time, the rising prevalence of the shadow economy may undermine economic stability (Medina and Schneider, 2018). A further result is market monopolization, shown in the execution of the green consumerism agenda. Market monopolization enables some corporations to exert complete control over pricing and optimize their profits, leading to inequitable competition, particularly in the sector for eco-friendly goods (Ambec and De Donder, 2021). Notwithstanding these repercussions, the attainment of environmental economics and sustainable development objectives is increasingly challenging, particularly for developing nations, due to numerous constraints, including insufficient funding, technology, expertise, and public awareness regarding the significance of sustainable economic practices (Ulph and Ulph, 2018).

III. ENVIRONMENTAL ECONOMICS AND SUSTAINABLE DEVELOPMENT: PRESENT STATUS AND EMERGING ISSUES: -

Economics must play a central role in resolving the sustainable development challenge because it provides the tools to allocate scarce resources toward clearly defined goals. By studying choices under scarcity, economics helps us understand both the beneficial and harmful effects of human activity, especially when combined with insights from the earth sciences. Equally important is the integration of economics with social and behavioural sciences, which is necessary for designing interventions that can change human behaviour in ways that support sustainability. Subfields such as development economics, ecological economics, environmental economics, and natural resource economics each contribute substantial evidence and theory relevant to sustainable development; together, they form the intellectual foundation for efforts to secure a decent quality of life within the planet's ecological limits. As Polasky et al. (2019) and other researchers have shown, these contributions are indispensable for framing policy and practice. Empirical studies from India and beyond illustrate the practical implications of this interdisciplinary approach. Verma (2018) investigated environmental and land-degradation issues in the Dang region of Rajasthan, an area spanning some 45,000 square kilometres that includes the Chambal River and the Vindhyanchal ridge. Verma describes how intense rejuvenation processes have created severe ravines—most visibly along the Chambal's roughly 480-kilometre course from Kota to Dholpur—and concludes that effective planning and equitable resource distribution are required at both governmental and community levels. Swami (2019) explored the intersection of economic growth and environmental sustainability, arguing that convergence between the two is possible and outlining economic tools that can guide scholars and policymakers along the difficult path of sustainable development; the study also notes that many developing countries address environmental problems by adopting and sometimes improving upon standards initially set by wealthier nations.

Mishra and Jakhanwal (2020) advocated for a systematic valuation approach to support a sustainable and inclusive economic recovery, emphasizing that recognizing the broad economic benefits of ecosystems can strengthen the resilience of businesses and communities in the face of recession and environmental stress. They call for coordinated advances in education, research, policy, and social action to build an equitable, ecologically sustainable society that respects both human and non-human rights and acknowledges ecological limits. Complementing this perspective, Srivastava and Choudhary (2021) highlight particulate pollution from hydrocarbon combustion as a pressing environmental-health challenge in India; they stress that while economic expansion is essential, policymakers must reconcile growth objectives with pollution-control measures, and scholars have shifted from narrow growth models toward broader conceptions of well-being that integrate natural resource health with quality of life.

Local-level research also underscores the social dimensions of conservation. Dagdi and Singh (2022) examined Udaipur district to identify how economic development pressures threaten biodiversity and to explore strategies for protecting local sacred groves (orans). Using secondary data, they mapped the distribution of orans and emphasized the crucial role of local communities in aligning development with conservation, recommending strengthened legal protection for these sites. Dwivedi & Dwivedi (2022) likewise argue for region-specific, integrated policies that pair ecological protection with economic progress, and they identify improved governance, technological innovation, and heightened public awareness as essential interventions. More recent contributions broaden the analytical and policy discourse. Chaturvedi et al. (2024) analyze institutional and structural barriers to sustainable development and call for comprehensive economic strategies that prioritise long-term ecological sustainability over short-term gains. Gogoi et al. (2025) focus on education, asserting that embedding environmental economics within Education for Sustainable Development (ESD) can raise environmental literacy and cultivate citizens capable of building equitable, resilient

societies. Comparative quantitative work by Teixeira et al. (2025), covering 20 countries from 1990–2019, suggests that in highly sustainable (usually developed) nations, sustainability can stimulate economic growth, whereas in less sustainable countries growth may precede and eventually enable environmental improvements. Finally, Zhang and Zhou (2025) investigate how trade openness, environmental taxation, financial depth, and renewable energy use influence natural resource exploitation, finding that financial depth and trade openness significantly drive resource use, with especially strong long-term effects observed for China. Taken together, these studies reinforce the argument that economic analysis—grounded in interdisciplinary evidence and attentive to local contexts—is essential for designing policies that balance development with ecological stewardship.

IV. CONCLUSION

The analysis underscores that environmental economics is indispensable for understanding the true costs of environmental degradation and for guiding policies toward sustainable development. Yet, the field is confronted with several challenges that must be addressed through well-defined policy measures.

Current Challenges

- Difficulty in monetary valuation of environmental goods and services due to their non-market nature.
- Complexity of environmental problems, often coupled with scientific uncertainty.
- Conflicts among efficiency, equity, and ecological sustainability in economic decision-making.
- Limited institutional capacity and insufficient integration of environmental economics in policy processes.
- Overreliance on substituting natural capital with human-made capital, which is not a sustainable solution.
- Inadequate recognition of the limits of natural ecosystems to sustain continuous economic growth.
- Need for multidimensional frameworks that balance allocation, distribution, and scale within ecological boundaries.

Policy Measures -

- Promote research in environmental economics through government grants, funding, and infrastructural support.
- Establish interdisciplinary research teams to analyze the economic valuation of environmental damages.
- Appoint environmental economists in cost–benefit analyses of development projects and environmental impact assessments.
- Expand the use of environmental taxes and polluter-pays mechanisms to regulate pollution effectively.
- Integrate environmental economics into curricula of environmental sciences, biological sciences, and natural resource management.
- Develop centers of excellence in universities and colleges to strengthen environmental economics education.
- Provide training in environmental economics for officials in forestry, environmental, and natural resource departments.
- Encourage democratic, scientific, and political processes in environmental decision-making to ensure inclusivity and accountability.
- Strengthen research and development systems to expand knowledge and practical applications of environmental economics.

By addressing these challenges through comprehensive policy measures, environmental economics can serve as a vital tool in harmonizing economic development with ecological sustainability, thereby ensuring a resilient and equitable future.

REFERENCES

1. Ambec, S., & De Donder, P. (2021). Environmental policy with green consumerism. Journal of Environmental Economics and Management, 111, 102584. https://doi.org/10.1016/j.jeem.2021.102584
2. Apokin, A. Yu., & Belousov, D. R. (2009). Scenarios for the development of the world and Russian economy as a basis for scientific and technological forecasting. Foresight-Russia, 3(3), 12–29.
3. Beder, S. (2011). Environmental economics and ecological economics: The contribution of interdisciplinarity to understanding, influence and effectiveness. Environmental Conservation, 38(2), 140–150. https://doi.org/10.1017/S0376892911000102
4. Biswas, A. K., Farzanegan, M. R., & Thum, M. (2012). Pollution, shadow economy and corruption: Theory and evidence. Ecological Economics, 75, 114–125. https://doi.org/10.1016/j.ecolecon.2012.01.007
5. Chaturvedi, S., Thomas, S., Thomas, W. S., Tiwari, V., & Javeed, S. (2024). The economics of sustainable development: Challenges and solutions. Educational Administration: Theory and Practice, 30(5), 9061–9067.

6. Dagdi, K., & Singh, B. (2022). Ecologism: A case study of Udaipur district conflict between economic development and biodiversity conservation of Rajasthan. International Journal of Management and Emerging Research, 11(9).
7. Daukaev, A. A., Dadashev, R. Kh., Gatsaeva, L. S., & Gakaev, R. A. (2019). Landslides and mudflows in the Chechen Republic: synergetic aspects. IOP Conference Series: Earth and Environmental Science, 378.
8. Dwivedi, V., & Dwivedi, T. (2025). Environmental challenges and sustainable development strategies in Rajasthan and Gujarat: An analytical perspective. Journal of Extension Systems, 38(2), 22–26. https://doi.org/10.48165/jes.2022.38.2.4
9. Field, B. C., & Field, M. K. (2017). Environmental economics: An introduction (7th ed.). New York, NY: McGraw-Hill Education.
10. Gogoi, S., Rai, B., Shivani, M., Maity, D., Gehlot, S., Khan, S., & Kumar, R. (2025). A critical review on environmental economics and education for sustainable development. International Journal of Environmental Sciences, 440–444. https://doi.org/10.64252/afepmz14
11. Jakhanwal, M., & Mishra, M. K. (2020). The economics of environment and ecology for sustainable development. ZBW – Leibniz Information Centre for Economics, 1–6.
12. Kahneman, D., & Knetsch, J. L. (1992). Valuing public goods: The purchase of moral satisfaction. Journal of Environmental Economics and Management, 22(1), 57–70. https://doi.org/10.1016/0095-0696(92)90019-S
13. Kurbanov, S., Meshchangina, E., & Stefanova, N. (2023). Environmental economics and sustainable development. E3S Web of Conferences, 451, 01010. https://doi.org/10.1051/e3sconf/202345101010
14. Lélé, S. M. (1991). Sustainable development: A critical review. World Development, 19(6), 607–621. https://doi.org/10.1016/0305-750X(91)90197-P
15. Medina, L., & Schneider, F. (2018). Shadow economies around the world: What did we learn over the last 20 years? (IMF Working Paper No. 18/17). Washington, DC: International Monetary Fund.
16. Mio, C., Panfilo, S., & Blundo, B. (2020). Sustainable development goals and the strategic role of business: A systematic literature review. Business Strategy and the Environment, 29(8), 3220–3245. https://doi.org/10.1002/bse.2568
17. Polasky, S., Kling, C. L., Levin, S. A., Carpenter, S. R., Daily, G. C., Ehrlich, P. R., Heal, G. M., & Lubchenco, J. (2019). Role of economics in analyzing the environment and sustainable development. Proceedings of the National Academy of Sciences of the United States of America, 116(12), 5233–5238. https://doi.org/10.1073/pnas.1901616116
18. Sachs, J. D. (2012). From Millennium Development Goals to Sustainable Development Goals. The Lancet, 379(9832), 2206–2211. https://doi.org/10.1016/S0140-6736(12)60685-0
19. Sadiku, M., Olaleye, O., & Musa, S. (2019). Environmental economics: A primer. Economics, Environmental Science. Retrieved from https://www.semanticscholar.org/paper/ENVIRONMENTAL-ECONOMICS%3A-A-PRIMER-Sadiku-Olaleye/ecf50f637fd55c01cbe5be58f4110c6ed27f0956#extracted
20. Sagoff, M. (2012). Environmental economics. In R. Chadwick (Ed.), Encyclopedia of applied ethics (2nd ed., pp. 97–104). Amsterdam: Elsevier. https://doi.org/10.1016/B978-0-12-373932-2.00143-7
21. Srivastava, P., & Choudhary, R. (2021). Economic growth and sustainable development in India. Antardrishti IUD Journal of Interdisciplinary Research, 1(2), 11–21.
22. Swami, M. S. (2019). Environmental economics for sustaining development: Framework and tools for researchers and policy makers. SSRN Electronic Journal, 1–21. https://doi.org/10.2139/ssrn.3420938
23. Teixeira, N., Rodrigues, R., & Rodrigues, A. (2025). Economic growth and environmental sustainability in more and less sustainable countries. Discover Sustainability, 6, 618. https://doi.org/10.1007/s43621-025-00618-y
24. Ulph, A., & Ulph, D. (2018). Environmental policy when consumers value conformity. Journal of Environmental Economics and Management, 109, 102172. https://doi.org/10.1016/j.jeem.2021.102172
25. Venkatachalam, L. (2007). Environmental economics and ecological economics: Where they can converge? Ecological Economics, 61(2–3), 550–558. https://doi.org/10.1016/j.ecolecon.2006.04.008
26. Verma, V. K. (2018). Ecological and economic sustainable development plan for "Dang" region of Rajasthan. Social Research Foundation, 158–159. Retrieved September 17, 2025, from http://www.socialresearchfoundation.com/upoadreserchpapers/6/204/1805210621581st%20vijay%20verma.pdf
27. Zhang, Z., & Zhou, Y. (2025). Economic growth vs environmental sustainability: Examining resource extraction in the world's largest economies. Frontiers in Environmental Science, 13, 1586619. https://doi.org/10.3389/fenvs.2025.1586619

International Journal of Advanced Research in Arts, Science, Engineering & Management (IJARASEM)

| Mobile No: +91-9940572462 | Whatsapp: +91-9940572462 | ijarasem@gmail.com |