

HYBRID MODE

लखनऊ अंतरराष्ट्रीय संगोष्ठी

7th International Conference on

ENVIRONMENT AND SOCIETY (ICES 2025)

Theme: Climate Change: Mitigation and
Environmental Ethics for Human Well-being

6 & 7 December, 2025

Abstracts and Souvenir

Organised and hosted by



Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow (Uttar Pradesh)
(Uttar Pradesh State Govt. University) <https://kmclu.ac.in/>

In Association with



Zoological Survey of India (ZSI), Kolkata
(Ministry of Environment, Forest and
Climate Change, Govt. of India)
<https://zsi.gov.in/>



**National Research Laboratory for
Conservation of Cultural Property (NRCL), Lucknow**
(Ministry of Culture, Govt. of India)
<http://www.nrcl.gov.in/>



Uttar Pradesh State Biodiversity Board, Lucknow
(Department of Environment, Forest and
Climate Change, Govt. of U.P.)
<https://upsbdb.org/>



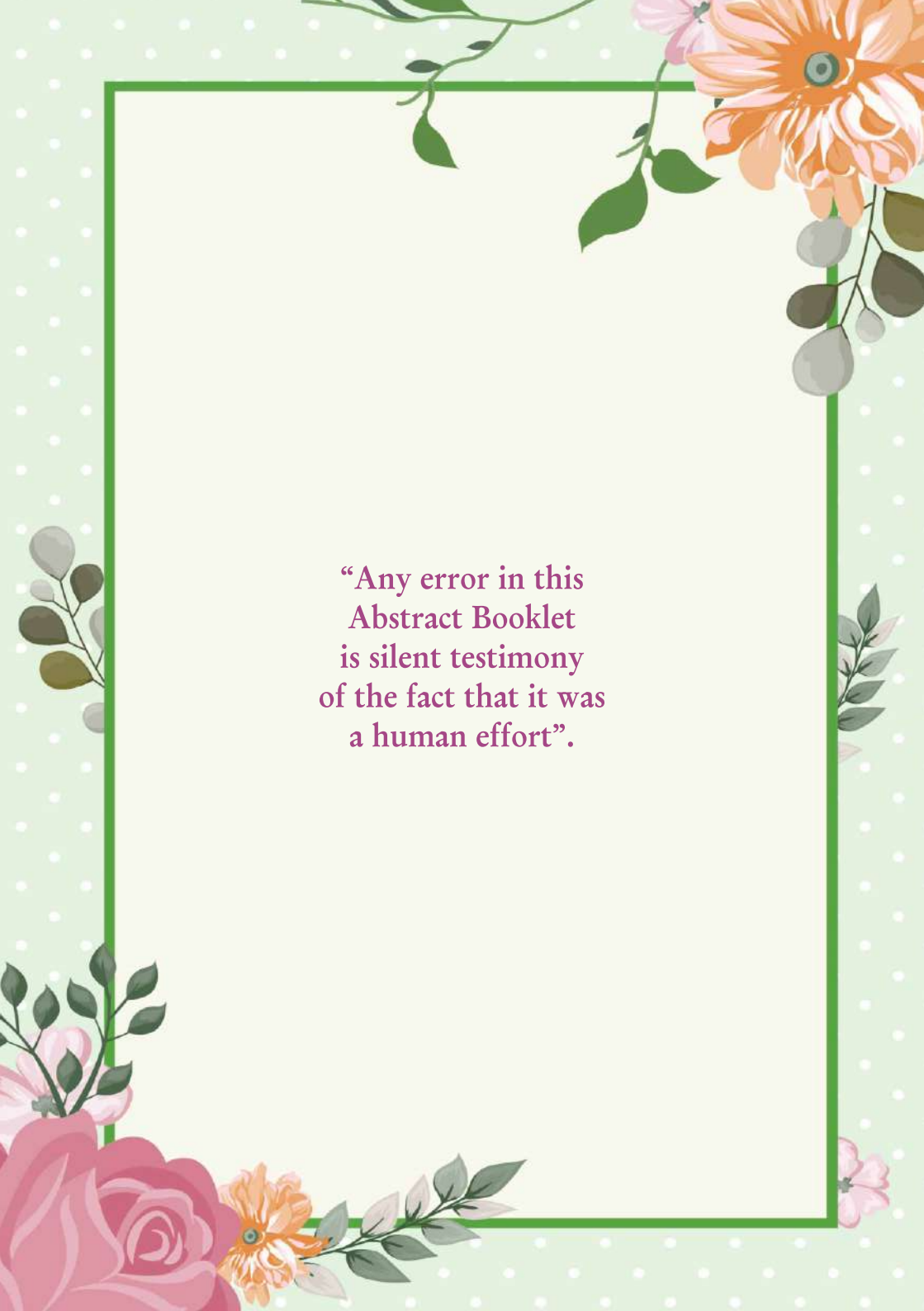
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**Global Environment &
Social Association (GESA), New Delhi**
<http://gesa.org.in/>

A decorative border surrounds the central text area. It features a light green background with small white dots. The border is composed of a thin green line. Various floral elements are placed along this line: a large orange daisy-like flower with a blue center and green leaves in the top right; a pink rose and a smaller orange flower with green leaves in the bottom left; and several small pink and white flowers with green leaves in the bottom right. Grey, teardrop-shaped leaves are also scattered along the left and right sides of the border.

“Any error in this
Abstract Booklet
is silent testimony
of the fact that it was
a human effort”.

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सत्यमेव जयते

**National Research Laboratory for
Conservation of Cultural Property (NRLC), Lucknow**
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International Journal of Biological Innovations (IJBI)

The IJBI is an official publication of the Global Environment & Social Association (GESA). The IJBI is a peer-reviewed, refereed, multi-indexed, open access and online journal, published **FREE OF COST** twice in a year i.e. June and December. It aims to disseminate the scientific research, recent biological innovations and to provide the most complete as well as reliable source of information on current developments in the field. The IJBI plays an important role in global academia by encouraging research, fostering knowledge and promoting new dimensions/developments in the areas related to biological sciences.

The IJBI is a fully open access journal for which author/user need not to pay any fee. Once published, articles will be immediately and permanently available for readers to read, download and share free of cost. The IJBI publishes original/ quality research articles, reviews and short communications pertaining to all fields of Biological Sciences (Botany and Zoology) including Environmental Science, Agriculture, Veterinary Science, Molecular Biology, Biotechnology, Biochemistry, Bioinformatics, Microbiology, Immunology and so on. Author (s) can submit articles through the online submission process. Email: chiefeditor.ijbi@gmail.com (**Website: <https://ijbi.org.in/index.php>**).

Currently, 8th volume of IJBI is in progress. Till date it has around **2000 Google Scholar Citations** (<https://scholar.google.com/citations?user=SmiqFZMAAAJ&hl=en>) **with 21 h-index and 56 i10-index**.



21 नवम्बर, 2025

सन्देश

मुझे यह जानकारी अत्यंत प्रसन्नता हुई कि जियोलॉजिकल सर्वे ऑफ़ इंडिया, कोलकाता, उत्तर प्रदेश स्टेट बायोडायवर्सिटी बोर्ड, लखनऊ; द अमेरिकन यूनिवर्सिटी, यू.एस.ए., एजुकेशन काउंसिल, हिसार (हरियाणा) एवं ग्लोकल एनवायरमेंटल ऐण्ड सोशल एसोसिएशन, नई दिल्ली के सहयोग से ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ में दिनांक 06-07 दिसम्बर 2025 को 7वीं अन्तर्राष्ट्रीय संगोष्ठी "Environment and Society (ICES 2025)" का आयोजन "Climate Change: Mitigation and Environmental Ethics for Human Well - Being " विषय पर किया जा रहा है।

जलवायु परिवर्तन अब केवल वैज्ञानिक चर्चा का विषय नहीं रह गया है, बल्कि मानव अस्तित्व, सामाजिक संरचना, नैतिक जिम्मेदारियों और आने वाली पीढ़ियों की सुरक्षा से जुड़ा एक वैश्विक प्रश्न बन चुका है। ऐसे परिप्रेक्ष्य में यह संगोष्ठी शोधार्थियों, विद्यार्थियों और शिक्षाविदों को चिंतन, संवाद और नवाचार के लिए एक प्रेरक मंच प्रदान करेगी। आशा है कि प्रकाश्य स्मारिका महत्वपूर्ण शोध-विचारों का उपयोगी संकलन बनेगी और शोधार्थियों व छात्र-छात्राओं में पर्यावरण संरक्षण के प्रति जागरूकता, संवेदनशीलता और सक्रियता को प्रोत्साहित करेगी।

संगोष्ठी के सफल आयोजन और स्मारिका के प्रकाशन हेतु हार्दिक शुभकामनाएँ प्रेषित करती हूँ।

आनंदीबेन
(आनंदीबेन पटेल)

योगेन्द्र उपाध्याय
मंत्री
उच्च शिक्षा विभाग



कक्षा सं०-63बी/डी, मुख्य भवन
विधान भवन, लखनऊ।
दूरभाष- 0522-2238051(कार्या०)
0522-2238112(आवास)

दिनांक- 27-11-2025



शुभकामना संदेश

प्रकृति मानव जीवन का आधार है। उसके बिना जीवन की कल्पना संभव नहीं है। प्रकृति ने मानव को उसके अस्तित्व, विकास और संतुलित जीवन के लिए आवश्यक सभी संसाधन प्रदान किए हैं। किंतु यह विचारणीय विषय है कि मानव इन संसाधनों का उपयोग किस प्रकार कर रहा है और प्रकृति को बदले में क्या लौटा रहा है। प्राकृतिक संसाधनों के अनियंत्रित दोहन के कारण संपूर्ण विश्व आज पर्यावरणीय असंतुलन और जलवायु परिवर्तन की गंभीर चुनौती का सामना कर रहा है।

मुझे यह जानकर प्रसन्नता है कि ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय द्वारा दिनांक 06-07 दिसंबर, 2025 को Climate Change: Mitigation and Environmental Ethics for Human Well-Being विषय पर आधारित 7वीं अंतरराष्ट्रीय संगोष्ठी 'Environment and Society (ICES 2025)' का आयोजन किया जा रहा है। यह विषय वर्तमान वैश्विक परिस्थितियों में अत्यंत प्रासंगिक एवं समयोचित है।

इस महत्वपूर्ण संगोष्ठी में देश-विदेश के ख्यातिप्राप्त विद्वानों व विशेषज्ञों की उपस्थिति निश्चय ही जलवायु परिवर्तन एवं पर्यावरण संरक्षण से संबंधित विभिन्न आयामों पर सार्थक चिंतन-मनन का अवसर प्रदान करेगी तथा अनेक ज्वलंत प्रश्नों के समाधान की दिशा भी प्रशस्त करेगी।

मैं इस आयोजन के लिए कुलपति महोदय सहित समस्त विश्वविद्यालय परिवार को हार्दिक शुभकामनाएँ प्रेषित करता हूँ और संगोष्ठी की पूर्ण सफलता की मंगलकामना करता हूँ।

(योगेन्द्र उपाध्याय)

दयाशंकर सिंह

राज्य मंत्री (स्वतंत्र प्रभार)
परिवहन विभाग



संख्या: 507C9A)
/वी.आई.पी./रा.मं.(स्व.प्र.)परि./2025

कक्ष सं.- 63A-63C, विधान भवन, लखनऊ
दूरभाष सं. : 0522-2238071, 2213259

दिनांक : 15.11.2025

शुभकामना संदेश

जलवायु परिवर्तन और प्राकृतिक आपदाएँ आज सम्पूर्ण मानवता के समक्ष गम्भीर एवं व्यापक चुनौती के रूप में उभर रही हैं। यह जानकर प्रसन्नता हुई कि ख़्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, कुलपति प्रो० अजय तनेजा जी के नेतृत्व में, जी०सा० से संबंधित एक महत्वपूर्ण एवं प्रासंगिक विषय पर अंतर्राष्ट्रीय संगोष्ठी का आयोजन कर रहा है।

यह आयोजन न केवल विश्वविद्यालय की पहचान को वैश्विक स्तर पर स्थापित करेगा, बल्कि लखनऊ की शैक्षणिक प्रतिष्ठा को भी नई दिशा प्रदान करेगा। इस संगोष्ठी में देश के कोने-कोने एवं विदेश से पधारने वाले सभी विद्वानों का मैं हार्दिक अभिनंदन करता हूँ तथा शोधपत्र प्रस्तुत करने वाले सभी अध्येताओं को शुभकामनाएँ देता हूँ। मुझे विश्वास है कि यह संगोष्ठी जलवायु परिवर्तन के विमर्श को नई दिशा प्रदान करेगी और उपयोगी निष्कर्षों के माध्यम से मानव कल्याण के लिए सार्थक मार्ग प्रशस्त करेगी।

शुभकामनाओं सहित।

(दयाशंकर सिंह)

आवास : 9 - कालीदास मार्ग, लखनऊ । ☎: 0522- 2235033 ☎: 9415026384

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कार्या. : जी-2/3, तृतीय तल, बापू भवन,
उत्तर प्रदेश सचिवालय, लखनऊ।
दूरभाष कार्या. : 0522-2238980
सी.एच. : 0522-2214808

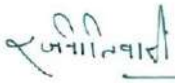


“शुभकामना संदेश”

मुझे यह जानकर अत्यन्त प्रसन्नता हो रही है कि ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ द्वारा दिनांक 06 एवं 07 दिसम्बर 2025 को "Climate Change: Mitigation and Environmental Ethics for Human Well-Being " विषय की थीम पर दो दिवसीय 7वीं अन्तर्राष्ट्रीय संगोष्ठी **"ENVIRONMENT AND SOCIETY (ICES 2025)"** का आयोजन किया जा रहा है एवं इस अवसर पर एक स्मारिका भी प्रकाशित की जा रही है।

पर्यावरण एवं पर्यावरणीय नैतिकता के सम्बन्ध में जागरूकता किसी भी समाज की बौद्धिक प्रगति की परिचायक होती है। इस प्रकार के आयोजन शिक्षाविदों, शोधार्थियों, विद्यार्थियों एवं नीति-निर्माताओं के नवाचार और शोधपरक गुणात्मक अभिवृद्धि में सहायक होते हैं। मुझे आशा है कि यह संगोष्ठी जलवायु परिवर्तन के पर्यावरण एवं मानव पर पड़ने वाले प्रभाव व पर्यावरणीय नैतिकता के विविध आयामों पर एक सार्थक विचार संगोष्ठी साबित होगी एवं भविष्य में जलवायु परिवर्तन व पर्यावरणीय नैतिकता से सम्बन्धित योजनाओं एवं कार्यक्रमों को बनाने में सहायक होगी।

स्मारिका के सफल प्रकाशन एवं अन्तर्राष्ट्रीय संगोष्ठी **(ICES 2025)** के सफलतापूर्वक आयोजन हेतु समस्त प्रतिभागियों एवं आयोजकों को हार्दिक शुभकामना !


(रजनी तिवारी)

आवास : 1- डालीबाग, लखनऊ, उत्तर प्रदेश
दूरभाष : 0522-2205445

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दूरभाष : 05852-222100



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डॉ० ए.के. वर्मा
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25.11.2025



Message

It is a matter of great pleasure that Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow (U.P.), India is organizing an international conference on **Environment and Society (ICES 2025)** on 6th and 7th December 2025. The basic theme of the conference "**Climate Change: Mitigation and Environmental ethics for human Well-being**" is quite pertinent in contemporary scenario of the globe in general and India in particular.

I congratulate the entire organizing team for taking up this challenging but momentous initiative. I hope that this conference will provide a platform for the researchers, scholars, academicians and practitioners of relevant fields to contemplate and present their research work along with the opportunity to interact with fellow researchers and veterans of their respective fields. I am confident that outcomes of this international conference on various issues on the subject will mark not only a significant milestone in the field concerned but also a testament to the power of collaboration, innovation and dedication exhibited by all esteemed speakers and participants.

I impart my eco-friendly best wishes for its grand success.

A.K. Verma
(Dr. A. K. Verma)



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ
Khwaja Moinuddin Chishti Language University, Lucknow

(Uttar Pradesh State Government University)



Prof. Ajay Taneja
Vice Chancellor

सन्देश

परिवर्तन प्रकृति का नियम है। प्रकृति के परिवर्तन क्रमिक, स्वाभाविक और रचनात्मक होते हैं। मनुष्य ने भी 'होमोनेड' से 'होमोसेपियंस' की यात्रा लाखों वर्ष के स्वाभाविक विकास में पूरी की है। लेकिन सभ्यतागत विकास के नाम पर मनुष्य का प्रकृति में हस्तक्षेप अनैतिक रूप से बढ़ता गया है। इसका दुष्प्रभाव समूची प्रकृति पर पड़ रहा है और जलवायु परिवर्तन अस्वाभाविक रूप से तेजी से हो रहा है। इस नुकसान से मनुष्य भी बाहर नहीं है। यह अपने आप ही अपने घर को ज्यादा अच्छा करने के लालच में उसे बर्बाद करने जैसा है। अतः पर्यावरणीय नैतिकता, प्रकृति के लिए मूल्यगत विकास और प्रतिबद्धता का होना मानव के हित के लिए अति आवश्यक है। ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय द्वारा लखनऊ में **Climate Change: Mitigation and Environmental Ethics for Human Well-Being** विषय की थीम पर आयोजित अंतर्राष्ट्रीय संगोष्ठी इसी दिशा में की जा रही एक पहल है। यह संगोष्ठी जियोलाॅजिकल सर्वे आफ इंडिया कोलकाता, उत्तर प्रदेश स्टेट बायोडायवर्सिटी बोर्ड लखनऊ, द अमेरिकन यूनिवर्सिटी यू०एस०ए०, एजुकेशन काउंसिल हिसार हरियाणा, ग्लोकल एनवायरमेंटल एण्ड सोशल एसोसिएशन, नई दिल्ली के सामूहिक सहयोग से आयोजित की जा रही है। संगोष्ठी की थीम में पॉलिसी गवर्नंस, ग्लोबल कॉरपोरेशन, ह्यूमन रिस्पॉसिबिलिटी, एनवायरमेंटल एथिक्स, क्लाइमेट चेंज, फूड एण्ड हेल्थ सेफ्टी, सस्टेनेबल डेवलपमेंट, एडवांस्ड ग्रीन टेक्नोलॉजी जैसे नए विषय शामिल किए गए हैं। मुझे आशा है की प्राप्त शोध पत्रों में प्रकृति संरक्षण, मानव संपदा और दुनिया के बेहत बविष्य के लिए बहुमूल्य विचार, दृष्टिकोण और मौलिक निष्कर्ष प्राप्त होंगे। मैं इस संगोष्ठी के सफल आयोजन हेतु अग्रिम शुभकामनाएं देता हूँ, तथा इसमें सहभागिता करने वाले समस्त विद्वत्तजनों को धन्यवाद प्रेषित करता हूँ।


(प्रो० अजय तनेजा)
कुलपति।



भारत सरकार
NRLC

National Research Laboratory for Conservation of Cultural Property

E/3, Aliganj, Lucknow-226024

Janhwi Sharma
Director General

"Message"

It is with immense pleasure and pride that I extend a warm greetings to all participants of the 7th Inter National Conference jointly organised with Khwaja Moinuddin Chishti Language University, Lucknow, Zoological Survey of India, UP state Biodiversity Board, Lucknow, The Americal University, USA, ERCD Research and Education Cauncil, Hisar and GESA, New Delhi on "**Environment and Society Theme: Climate Change: Mitigation and Environmental Ethics for Human Well-being.**"



Climate change is not merely an environmental issue but a multidimensional challenge that profoundly impacts our ecosystems, livelihoods, and cultural heritage. As stewards of both nature and tradition, it is our collective responsibility to ensure the harmonious coexistence of development and conservation. The intersection of climate change and cultural heritage as well as biodiversity conservation requires a comprehensive and collaborative approach that integrates stakeholder engagement, interdisciplinary research, and context-sensitive policies.

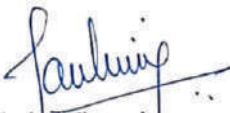
This platform brings together researchers, policymakers, academicians, and environmental enthusiasts to deliberate on the pressing challenges posed by climate change and the urgent need for sustainable conservation practices.

I hope the discussions, presentations, and networking opportunities offered during this conference will lead to actionable outcomes and ignite a shared commitment to safeguarding the rich natural and cultural heritage that defines our identity and sustains our planet.

Let us use this occasion to bridge the gap between scientific insights and community-driven initiatives, paving the way for a sustainable and resilient future.

Wishing you all an engaging and fruitful conference!

Warm regards,


(Janhwi Sharma)

डॉ. धृति बैनर्जी
निदेशक
Dr. Dhriti Banerjee
Director



भारत सरकार
भारतीय प्राणि सर्वेक्षण
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Government of India
Zoological Survey of India
Ministry of Environment, Forest and Climate Change



Message

It gives me immense pleasure to extend my warm greetings and best wishes on the occasion of the International Conference on Environment and Society (ICES 2025) on “Climate Change: Mitigation and Environmental Ethics for Human Well-being”, being organized **Global Environment & Social Association (GESA), New Delhi** in collaboration with Zoological Survey of India, Kolkata, The American University, USA, ECRD Research and Education Council, Hisar (Haryana), Uttar Pradesh State Biodiversity Board, Lucknow, The National Research Laboratory for Conservation of Cultural Property (NRLC), Lucknow, (Ministry of Culture, Govt. of India) and Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow held on December 6th and 7th 2025 at Lucknow, Uttar Pradesh, India.

The theme of the conference “**Climate Change: Mitigation and Environmental Ethics for Human Wellbeing**” is of immense relevance in today’s world, where sustainability, food security, and biodiversity are among the most pressing global concerns.

As Director of the Zoological Survey of India, I understand the critical role that such interdisciplinary platforms play in fostering scientific inquiry, sharing innovative research, and promoting collaborations that can lead to actionable outcomes in recent trends in agricultural development and environmental sciences.

I appreciate the efforts of GESA in organizing this meaningful academic gathering and creating a forum for dialogue among researchers, academicians, and students. I am confident that the conference will stimulate impactful discussions and contribute to the advancement of scientific knowledge and sustainable solutions.

Wishing the conference great success and a productive outcome.

Date: 22-11-2025

Dr. Dhriti Banerjee



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B. Prabhakar, IFS
Secretary



Uttar Pradesh State Biodiversity Board
Department of Environment, Forests & Climate
Change, Government of Uttar Pradesh
(An Autonomous and Statutory/Regulatory Body under the
Biological Diversity Act, 2002, GOI)

Foreword



Climate change presents a fundamental threat to human health. It affects the physical environment as well as all aspects of both natural and human systems – including social and economic conditions and the functioning of health systems. Climate change is playing an increasingly important role in the decline of biodiversity. It has caused the loss of local species, increased diseases, and driven mass mortality of plants and animals, resulting in the first climate-driven extinctions.

Biodiversity helps to mitigate climate change by acting as a natural carbon sink through healthy ecosystems like forests, peat lands, and oceans, which absorb and store large amounts of carbon dioxide. Biodiversity is a critical foundation of the earth's life support system. It provides the basics of life – food, fuel and medicine, is responsible for eco-system functions such as water supply and water purification, pollination, regulation of pests and diseases, water cycle, carbon cycle and soil nutrient recycling, provides ecosystem resilience and is also valued for cultural, spiritual and religious reasons. The benefits provided by biodiversity are important for human well beings. A healthy biodiversity helps maintain the fine balance of our environment by continuously replenishing, recycling and rebuilding.

Climate change and biodiversity loss are part of an interlinked planetary crisis the world is facing today. They need to be tackled together if we are to advance the Sustainable Development Goals and secure a viable future on this planet.

I am confident that the purpose of organizing International Congress on "Climate Change: Mitigation and Environmental Ethics for Human Well-being" will lay the foundation for more insightful discussions among the Scientists, Researchers, Teachers and Students towards the Conservation of Biodiversity.

I extend my warm greetings to the Organizers, Conveners and the organizing team for their painstaking effort in organizing the 7th International Conference on Environment and Society (ICES 2025).

I extend a warm welcome to all the participants to the city, known as the "City of Tehzeeb", capital of Uttar Pradesh and wish them an engaging and fruitful experience in making this International Conference a GRAND SUCCESS.


(B Prabhakar)

Secretary,

Uttar Pradesh State Biodiversity Board,
Lucknow



Our Vision: Conservation beyond Imagination

East Wing, III Floor, 'A'-Block, PICUP BHAWAN, Vibhuti Khand, Gomti Nagar, Lucknow – 226010
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भारत सरकार /GOVERNMENT OF INDIA
भाभा परमाणु अनुसंधान केन्द्र /BHABHA ATOMIC RESEARCH CENTRE
पर्यावरणीय अनुवीक्षण तथा मूल्यांकन प्रभाग
ENVIRONMENTAL MONITORING & ASSESSMENT DIVISION
पर्यावरण सर्वेक्षण प्रयोगशाला /ENVIRONMENTAL SURVEY LABORATORY
न.प.बि.घ., डाकघर: संयत्र स्थल, जिला बुलंदशहर (उ०प्र०)
NAPS, PO. PLANT SITE, BULANDSHAHR, (U.P.) - 203389



Message

I extend my heartfelt congratulations to the entire organizing team for successfully hosting the 7th International Conference on Environment and Society (ICES 2025) under the compelling theme: “Climate Change: Mitigation and Environmental Ethics for Human Well-being” on the 6th and 7th of December, 2025. This event stands as a significant milestone in the field and reflects the remarkable power of collaboration, innovation, and dedication demonstrated by all participating speakers and delegates. Your collective efforts have greatly contributed to advancing scientific understanding and promoting meaningful interdisciplinary dialogue. I sincerely commend the organizers for their meticulous planning and tireless commitment in coordinating a conference of such scale and relevance. Your dedication to creating a vibrant platform for knowledge exchange has offered invaluable opportunities for researchers, scholars, and practitioners to engage in insightful and impactful discussions.

With warm regards and best wishes.

(Y.P. Gautam)





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Nayak Pura, Bijwasan, New Delhi, 110061

Ref No. ECRD/2025/081

Date : 27-11-2025



MESSAGE

I extend my heartfelt congratulations to entire organizing team for organizing an International Conference on ENVIRONMENT AND SOCIETY (ICES 2025) on 6th and 7th December, 2025. I hope that the culmination of this conference marks not only a significant milestone in the relevant field but also a testament to the power of collaboration, innovation, and dedication exhibited by all involved speakers and delegates. Your collective efforts have undoubtedly contributed to the advancement of scientific knowledge and the promotion of interdisciplinary dialogue. I commend the organizers for their meticulous planning and tireless efforts in orchestrating a conference of such magnitude. Your dedication to fostering a platform for exchange and learning has provided invaluable opportunities for researchers, scholars, and practitioners to come together and engage in meaningful discussions. With warm regards and best wishes.

Dr. Sandeep Kumar

Chairman,

ECRD Research and Education Council



GLOBAL ENVIRONMENT & SOCIAL ASSOCIATION (GESA)

H.O.: 62, Jasola, New Delhi-110025
<http://www.gesa.org.in>



Message

Dear Colleagues, Researchers, and Environmental Advocates,

It gives me immense pleasure to extend my warmest greetings to all participants, organizers, and delegates of the 7th International Conference on Environment and Society (ICES 2025). I commend Khwaja Moinuddin Chishti University, Lucknow, for hosting this vital platform dedicated to addressing one of humanity's most pressing challenges climate change. The theme "Climate Change: Mitigation and Environmental Ethics for Human Well-being " resonates deeply with our collective responsibility toward the planet and future generations. As we witness unprecedented environmental transformations, the need for ethical frameworks and actionable mitigation strategies has never been more urgent. This conference provides an essential forum for interdisciplinary dialogue, where scientific expertise meets policy innovation and grassroots wisdom. encourage all participants to engage vigorously in deliberations, share innovative research, and forge collaborative partnerships. Let this conference inspire us to move from awareness to action, from concern to commitment. Together, we can build resilient societies that harmonize human progress with ecological integrity.

I wish ICES 2025 tremendous success and look forward to the transformative outcomes that will emerge from your collective wisdom and dedication.

With warm regards,

Prof. M.D. Ram Gupta

President

Global Environment and Society Association (GESA)



ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ
Khwaja Moinuddin Chishti Language University, Lucknow



Message

It gives me immense pleasure to welcome all esteemed scholars, researchers, academicians, and practitioners to the 7th International Conference on Environment and Society (ICES) on the theme "*Climate Change: Mitigation and Environmental Ethics for Human Well-being*", being organised at Khwaja Moinuddin Chishti Language University, Lucknow from 6-7 December, 2025.

In an era where climate change presents some of the most complex challenges to humanity, the need for interdisciplinary dialogue and collective action has never been more urgent. This conference seeks to bring together diverse perspectives that explore scientific, social, ethical, and cultural dimensions of environmental sustainability. By fostering meaningful discussion, we aim to deepen our understanding of mitigation strategies and strengthen our commitment to environmental ethics that ensure the long-term well-being of present and future generations.

The papers and abstracts compiled in this souvenir reflect the rich scholarship and innovative thinking that participants bring to this platform. They not only highlight pressing environmental concerns but also present thoughtful insights, research-based solutions, and ethical frameworks essential for shaping a more sustainable world.

I extend my sincere and heartfelt gratitude to Hon'ble Vice-Chancellor **Prof. Ajay Taneja** for his unwavering support and encouragement. I also acknowledge the efforts of all contributors, keynote speakers, session chairs, participants, and organizing committee members whose dedication has made this conference possible.

I hope that ICES 2025 becomes a meaningful academic experience for all and inspires continued engagement with environmental issues at local, national, and global levels.

(Dr. Nalini Misra)

Convenor, 7th International Conference on
Environment and Society (ICES 2025)



Dr. Sadguru Prakash

M.Sc., Ph.D., D.Sc. (Honoris causa)

FGAS, FBPS, FGESA, FABRE, FNAS, FIAZ, FGIR, FZSI

Department of Zoology

M.L.K.P.G. College, Balrampur, U.P.

sadguruprakash@gmail.com.



Message

Climate change is not only an environmental issue but a profound ethical and humanitarian concern. Its impacts on ecosystems, biodiversity, public health, food security, and human livelihoods call for urgent and collective action. Through this conference, we aim to explore sustainable mitigation strategies, strengthen environmental responsibility, and encourage ethical decision-making that promotes the well-being of present and future generations. Notably, these issues often emerge at the local level but gradually escalate into global concerns. So, in order to enhance the mass awareness about this global issue, Glocal Environment and Social Association (GESA) New Delhi in association with Khwaja Moinuddin Chishti Language University, Lucknow, Zoological Survey of India (ZSI), Kolkata, National Research Laboratory for Conservation of Cultural Property (NRLC), Lucknow, Uttar Pradesh State Biodiversity Board, Lucknow, The American University (USA) and ECRD Research and Education Council, Hisar (Haryana) is organizing 7th International Conference on “Environment and Society” under the compelling theme : “*Climate Change: Mitigation and Environmental Ethics for Human Well-being*” from 6th to 7th December, 2025.

This conference serves as an important platform for sharing scientific knowledge, exchanging innovative ideas, and fostering meaningful dialogue on one of the greatest global challenges of our time. I extend my heartfelt thanks to all distinguished delegates, researchers, academicians, policymakers, and participants of this conference. I am confident that the diverse perspectives shared during this event will inspire collaborative solutions and contribute significantly to global sustainability efforts. I extend my sincere gratitude to all keynote speakers, session chairs, presenters, organizing committee members, and participants for their dedication and support in making this conference a success.

I wish you all a productive, insightful, and enriching experience.

(Dr. Sadguru Prakash)

Convener, 7th ICES-2025





GLOCAL ENVIRONMENT & SOCIAL ASSOCIATION (GESA)

H.O.: 62, Jasola, New Delhi-110025

<http://www.gesa.org.in>



Message

Dear Esteemed Participants and Distinguished Guests,

On behalf of the Glocal Environment & Social Association (GESA), New Delhi, I extend my heartfelt greetings to all delegates, scholars, and stakeholders gathering for the 7th International Conference on Environment and Society (ICES 2025). It is a privilege to collaborate with Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow, and our esteemed partners the Zoological Survey of India, Kolkata; Uttar Pradesh State Biodiversity Board, Lucknow; The American University, USA; Department of Environment, Forest and Climate Change, Government of U.P.; National Research laboratory for Conservation of Cultural Property, Lucknow and ECRD Research and Education Council, Hisar in organizing this significant event. The theme "Climate Change: Mitigation and Environmental Ethics for Human Well-being " reflects our shared commitment to addressing the environmental crisis through both scientific innovation and moral responsibility.

Climate change demands not only technological solutions but also a fundamental shift in how we perceive our relationship with nature and each other. This conference brings together diverse voices of scientists, policymakers, educators, activists, and community leaders to foster meaningful dialogue and develop integrated approaches toward sustainability. GESA remains dedicated to promoting environmental consciousness and social equity through research, advocacy, and capacity building. We believe that conferences like ICES 2025 serve as crucial catalysts for transforming ideas into impactful interventions that benefit both present and future generations. I urge all participants to engage actively, share your insights generously, and build networks that extend beyond these two days. Let us work together to create actionable roadmaps for a sustainable and equitable future.

I wish the conference great success and thank KMCLU for their exemplary hospitality and leadership.

Warm regards,

Prof. Sunita Arya

Secretary, Membership Affairs

Glocal Environment & Social Association (GESA), New Delhi

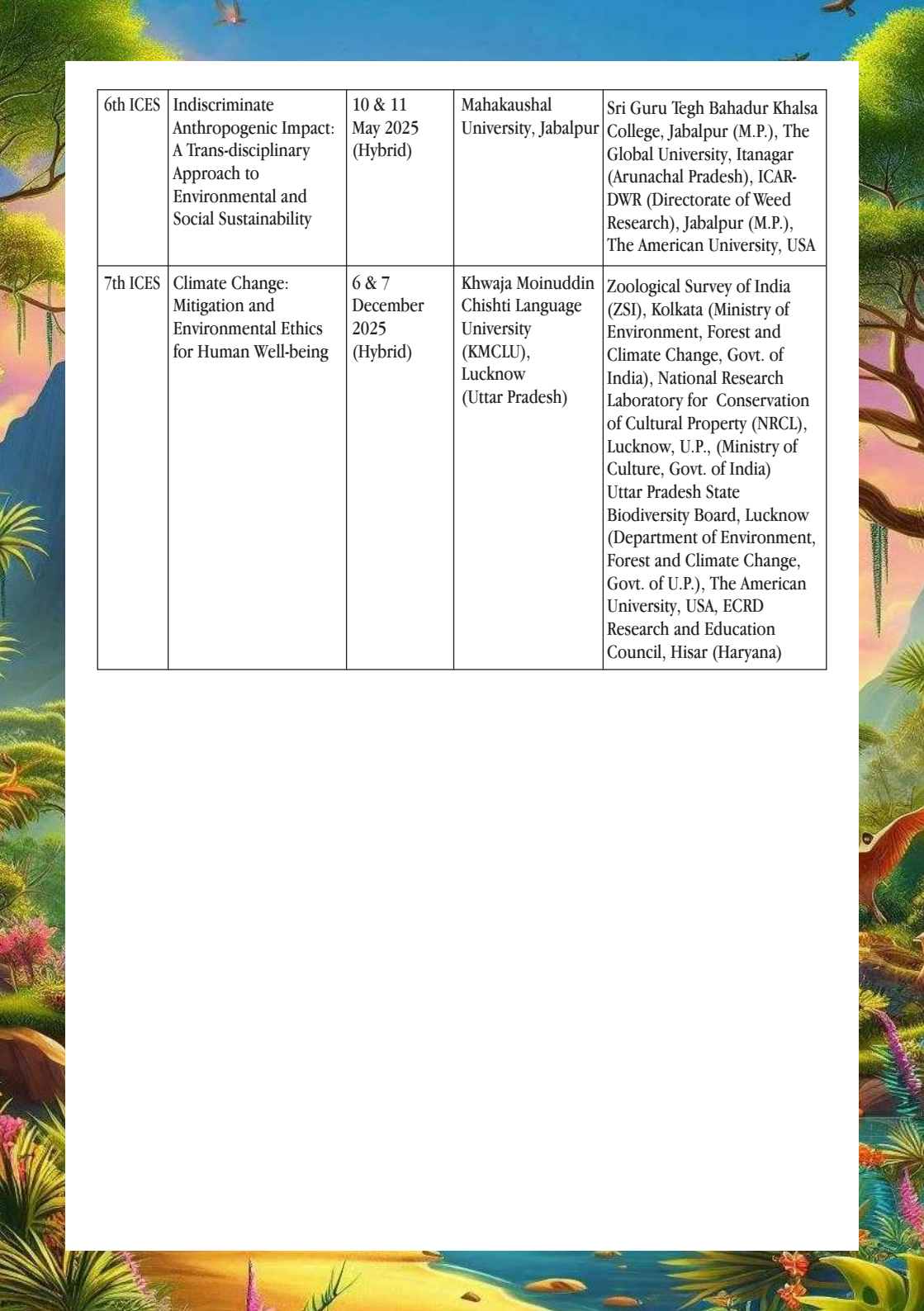
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ABOUT the ICES

Glocal Environment & Social Association (GESA) came into existence on 16/12/2018 in a formal meeting held at Prayagraj, the confluence city of three holy rivers namely the Ganga, the Yamuna and the mythical Saraswati. Its annual session is organized in the form of an international conference on “Environment and Society (ICES)”, preferably in the month of December every year. Here, is the summary of ICES held:

S.No.	Theme	Dates (mode)	Venue	In Association with
1st ICES	Socio-economic Challenges of Agriculture, Biodiversity & Environment	22 & 23 Dec. 2019 (Physical)	Harcourt Butler Technical University (HBTU) Kanpur	DG PG College Kanpur, Indian Thinkers' Society (ITS) Kanpur and Asian Biological Research Foundation (ABRF) Prayagraj
2nd ICES	Socio-economic and Environmental Issues: Challenges and Future Prospects in Current Pandemic Situation	26, 27 & 28 Dec. 2020 (Online)	Online	Maharishi Markandeshwar (Deemed to be University), Mullana Ambala (HR), Govt. KRG PG (Auto.) College, Gwalior (M.P.), K.J. Somaiya College of Arts, Commerce & Science, Kopargaon, Ahmednagar (MS), National Environmental Science Academy (NESA), New Delhi and Asian Biological Research Foundation (ABRF), Prayagraj (U.P.).
3rd ICES	Interdisciplinary Approach in Education, Environment, Spirituality & Technology	23, 24 & 25 Dec. 2021 (Hybrid)	Nehru Gram Bharati University (NGBU) Jamunipur, Prayagraj	-----
4th ICES	Recent Advancement in Disaster Management, Agriculture and Environmental Sustainability	23 & 24 Dec. 2022 (Hybrid)	Jiwaji University, Gwalior	National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Govt. of India, Govt. KRG PG (Autonomous) College, Gwalior (M.P.), Govt. P.G. (Autonomous) College, Datia (M.P.), Nepal Aquaculture Society, Kathmandu and ABRF, Prayagraj
5th ICES	Recent Advancement in Disaster Management, Agriculture and Environmental Sustainability	29 & 30 Dec. 2023 (Hybrid)	Dr. RML Avadh University, Ayodhya	The American University, USA and Department of Environment, Forest and Climate Change, Govt. of Uttar Pradesh.



6th ICES	Indiscriminate Anthropogenic Impact: A Trans-disciplinary Approach to Environmental and Social Sustainability	10 & 11 May 2025 (Hybrid)	Mahakaushal University, Jabalpur	Sri Guru Tegh Bahadur Khalsa College, Jabalpur (M.P.), The Global University, Itanagar (Arunachal Pradesh), ICAR-DWR (Directorate of Weed Research), Jabalpur (M.P.), The American University, USA
7th ICES	Climate Change: Mitigation and Environmental Ethics for Human Well-being	6 & 7 December 2025 (Hybrid)	Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow (Uttar Pradesh)	Zoological Survey of India (ZSI), Kolkata (Ministry of Environment, Forest and Climate Change, Govt. of India), National Research Laboratory for Conservation of Cultural Property (NRCL), Lucknow, U.P., (Ministry of Culture, Govt. of India) Uttar Pradesh State Biodiversity Board, Lucknow (Department of Environment, Forest and Climate Change, Govt. of U.P.), The American University, USA, ECRD Research and Education Council, Hisar (Haryana)

GESA SPECIAL AWARDS

1. RKV Lifetime Achievement Award

The Founder President of GESA, Mr. Ram Kumar Verma was born in Faizabad (now Ayodhya), who walked this earth as a beacon, not merely to exist but to awaken the people. A brilliant scholar, a sage, a steward of the earth; he was an educationist of rare insight, an environmentalist ahead of his time, a social thinker with the courage to question, and a reformer who wove ideals into action. Above all, he was a teacher in the truest sense and brought not only knowledge, but awareness particularly in rural areas. He stood against the rusted chains of caste, against the silence of stigma, against the shadow of untouchability and blind orthodoxy.

Mr. Verma's life stood as a paragon of the virtues he so passionately espoused: Punctuality, Diligence, Dedication, Devotion, and Amiability were not mere attributes, but the very fabric of his being, qualities which, to this day, continue to inspire reverence and emulation. In his vision, all were equal, all were worthy, all were human and he lived that truth undaunted, unshaken and unwavering.

Now, he is no more and left us forever on December 26, 2024, leaving behind a legacy of uncommon stature and immeasurable impact. Although, he is no longer among us, his legacy stands tall, like a tree whose shade shelters generations; his stalwart stature itself will regularly enthused as torch-bearer for upliftment of the people.

In eternal homage, GESA decided to commence RKV Lifetime Achievement Award since this year. This highest honour of GESA will be bestowed to those who mirror his spirit, those who serve Society, Humanity, and Nature with distinction, integrity, and love. This sacred recognition shall be offered amid the radiant gathering of national and international dignitaries during GESA's annual International Conference on Environment and Society (ICES). The honoree shall receive a framed testament of honor, a memento wrought with care, an angvastram, symbol of purity and respect along with a potted plant, symbol of ecological balance and clean environment.

As per unanimous recommendation of the high power award search committee, the name finalized for RKV Lifetime Achievement Award for 6th ICES is of Prof. D.R. Singh Hon'ble Vice Chancellor, Bihar Agriculture University, Sabour, Bhagalpur. Similarly, Dr. Kshetrapal Gangwar, Ex. Chairman, Uttar Pradesh Intermediate Service Selection Board, Allahabad is strongly recommended for RKV Lifetime Achievement Award for 7th ICES. Both Prof. Singh and Dr. Gangwar fully deserve this highest award as their commendable and meaningful contribution in the field of Society, Humanity and Nature are very high. Thus, recipients of this award are:

1. **Prof. D.R. Singh**, Vice Chancellor, Bihar Agriculture University, Sabour, Bhagalpur (Bihar) [6th ICES; May 10 & 11; Mahakaushal University, Jabalpur].
2. **Dr. Kshetrapal Gangwar**, Ex. Chairman, Uttar Pradesh Intermediate Service Selection Board, Allahabad (U.P.) [7th ICES; Dec. 6 & 7, 2025; Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow].

GESASPECIALAWARDS

2. Birendra Singh Memorial Glocal Award for Social Services

Mr. Birendra Singh, by Profession was an Architect and Environmentalist-cum-Social worker, from Allahabad (now Prayagraj). He was Founder Treasurer of GESA. While world-wide disastrous COVID-19 incidence period, widely known as 'LOCKDOWN', for up-keeping of the humanity, he was continuously extending door-to-door social services among the victims of the COVID positive patients and taking care as leader as much as possible and distributing food packets, medicines and needful items. He was detected COVID positive, admitted in MLN Medical College, Prayagraj for treatment and lost the battle as a real 'Hero', on 05.05.2020 (first reported death case due to COVID from Allahabad).

To commemorate his commendable role/services for Cleanliness, Environment and Society, the Executive Council of GESA initiated to remember him in the form of an Award 'Birendra Singh Memorial Glocal Award for Social Services' in 2021. The Recipients of this award till now are:

1. **Prof. M.D.R. Gupta**, Principal, Govt. PG College, Bhadohi (U.P.) [3rd ICES 2021; Nehru Gram Bharti Deemed to be University, Jamunipur, Prayagraj]
2. **Dr. Sheo Kumar**, Scientist 'F' (Additional Director), Botanical Survey of India, CRC, Allahabad (U.P.) [4th ICES 2022; Jiwaji University, Gwalior]
3. **Prof. Bechan Sharma**, Dean, Faculty of Science, University of Allahabad, Prayagraj (U.P.) [5th ICES 2023; Dr. RML Avadh University, Ayodhya]
4. **Dr. D.K. Sharma**, Civil Surgeon & Medical Specialist (Retd.), District Hospital, Gwalior (M.P.) [6th ICES 2024; Mahakaushal University, Jabalpur].
5. **Dr. Somesh Gupta**, Senior Technical Officer, Uttar Pradesh State Biodiversity Board, Lucknow (U.P.) [7th ICES 2025; Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow (Uttar Pradesh)].

ABOUT THE ORGANIZERS



Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow (Uttar Pradesh) (Uttar Pradesh State Govt. University)

The university situated at Sitapur-Hardoi Bypass Road, is NAAC accredited. It is dedicated to imparting quality education while instilling in its students a profound understanding of the nation's cultural tapestry, encouraging them to actively contribute to the evolution of a knowledge-driven society. The University commenced its inaugural academic session in August 2013, offering a diverse array of disciplines including Urdu, Arabic, Persian, English, Hindi, Geography, History, Economics, Home Science, Physical Education, Political Science, Education, Commerce, Computer Science, Business Administration and Journalism and Mass Communication at both the Graduate and Postgraduate levels.

Additionally, Diploma Programmes have gained popularity among students attending the University. Presently, the student body has grown to 4,500+ reflecting a significant increase in the number of programmes offered. Since its inception, the University has experienced substantial growth in scale and academic offerings. It now provides a wide spectrum of educational opportunities to students from across the state and beyond. With a harmonious blend of professionalism and tradition, the University has carved a distinct niche in the academic landscape of Uttar Pradesh. The University has introduced AICTE-approved B.Tech. Programmes in Civil Engineering, Mechanical Engineering, Biotechnology, Computer Science and Engineering in 2019. Further the University introduced Computer Science and Engineering (Artificial Intelligence and Data Science), Computer Science and Engineering (Artificial Intelligence and Machine Learning) and M.Tech. Mechatronics in the subsequent years. The University has also initiated Ph.D. programme in all disciplines. Additionally, the University successfully running LL.M. and LL.B. programmes under the Faculty of Legal Studies. Moreover, Diploma and Bachelor of Pharmacy programmes have commenced from the academic session 2023-24.



Zoological Survey of India (ZSI), Kolkata (Ministry of Environment, Forest and Climate Change, Govt. of India)

The Zoological Survey of India (ZSI) was established on 1st July, 1916 to promote survey, exploration and research leading to the advancement in our knowledge of various aspects of exceptionally rich life of the erstwhile 'British Indian Empire'. The survey has its genesis in the establishment of the Zoological Section of the Indian Museum at Calcutta in 1875. By

gradually strengthening its staff and expanding its research programme, the Survey has met the challenge of the past and is on its way to meet the demands of the future.

It has maintained its primary objectives unchanged from its inception, which include:

- Exploration, Survey, Inventorying and Monitoring of faunal diversity in various States, Ecosystems and Protected areas of India
- Maintenance & Development of National Zoological Collections
- Taxonomic and systematic studies on fauna of India
- Periodic review of the Status of Threatened and Endemic species
- Publication of Fauna of India, Fauna of States and Conservation areas
- Ecological and biological studies on species and communities
- Creation and maintenance of “Fauna of India database”
- Training and capacity building in animal taxonomy and conservation
- Wildlife forensics and Identification and Advisory services to academia, organizations/bodies
- Development and maintenance of Museum at Headquarters and Regional centres
- Genomic studies on fauna of India



सत्यमेव जयते



National Research Laboratory for Conservation of Cultural Property (NRCL), Lucknow, U.P. (Ministry of Culture, Govt. of India)

The National Research Laboratory for Conservation of Cultural Property (NRLC) established in 1976 under the Ministry of Culture is the premier organization for research in the conservation of cultural property including monuments and sites, as well as museums, library and archive collections. NRLC is well-equipped with adequate infrastructure and laboratories for material composition and on art-making techniques, developing methods to slow down deterioration and prevent further damage, providing information on the cause of deterioration and treatment options, devising conservation solutions and assessing treatment performance of cultural materials. NRLC published about 200 research papers in peer-reviewed journals of national and international repute and proceedings.



Uttar Pradesh State Biodiversity Board, Lucknow, U.P. (Department of Environment, Forest and Climate Change, Govt. of U.P.)

Biodiversity encompasses the variety of all life on earth. India is one of the 12-mega biodiversity countries of the world. With only 2.5% of the land area, India already accounts for 7.8% of the recorded species of the world. India is equally rich in traditional and indigenous knowledge, both coded and informal. India is a Party of the Convention on Biological Diversity (1992). Recognizing the sovereign rights of States to use their own biological resources, the Convention expects the Parties to facilitate access to genetic

resources by other Parties for environmentally sound purposes subject to national legislation and on mutually agreed upon terms (Article 3 and 15 of CBD). Article 8(j) of the Convention of Biological Diversity recognizes contributions of local and indigenous communities to the conservation and sustainable utilization of biological diversity through traditional knowledge, practices and innovations and provides for equitable sharing of benefits with such people arising from the utilization of their knowledge, practices and innovations.

Biodiversity is a multi-disciplinary subject involving diverse activities and actions. The stakeholders in biological diversity include the Central Government, State Government, institutions of local self-governmental organizations, industry, etc. One of the major challenges before India lies in adopting an instrument, which helps realise the objectives of equitable sharing of benefits enshrined in the Convention on Biological Diversity.



ECRD Research and Education Council, Hisar (Haryana)

At ECRD Research and Education Council, our mission is to foster global educational excellence. We are dedicated to transforming the educational landscape through innovative conferences, dynamic workshops, and collaborative learning opportunities. Emphasizing the advancement of teachers and students worldwide, we strive to equip educators with the knowledge and tools they need to inspire future generations. Our initiatives are diverse and impactful, ranging from educational conferences designed to drive excellence to workshops that empower educators and students globally. We believe in the power of education to ignite change and are committed to providing platforms that encourage growth, learning, and development. ECRD also proudly hosts an International Award Ceremony, celebrating the invaluable contributions of teachers, scholars, and social workers. These awards are a testament to their dedication and impact in their respective fields, advancing the boundaries of education and social improvement. Join us as we work towards an empowered educational future, where learning knows no boundaries. Together, we can create a world where knowledge and skills are accessible to all.



The American University, USA

This is a non-political, non-racial, non-sectarian, interdenominational, Inter-Cultural IGO registered as a 501 (c) 3 organization in USA. WE SUPPORT the UNIVERSALLY ACCEPTED 10 PRINCIPLES OF UNITED NATIONS Global Compact, UNITED NATIONS Academic Impact, UNITED NATIONS HUMAN RIGHTS & ALL CHARTERS OF UNITED NATIONS & EUROPEAN UNION. The American University in USA has a primary ICT studies, and to build competencies offocus of helping scholars carry out research into Theology, Peace and Con peace activists worldwide.



Glocal Environment & Social Association (GESA), New Delhi

In order to serve a bit the Nature and Society for better future, the Glocal Environment & Social Association (GESA) is constituted. Its headquarter is located in New Delhi. Its main aim is to develop and promote 'global thought and local action' ideology to save the nature. It organizes the seminars; workshops etc. to aware and educate the people on blazing environmental and social issues. The GESA felicitates the persons and organizations for their outstanding services rendered in various fields of agriculture, arts, biodiversity conservation, commerce, culture, education, environment, healthcare, humanities, literature, mass communication, music, patriotism, peace and harmony, science, sports, technological innovations and other social services. The GESA will confer following categories of awards and honours through search and nominations to its members during this 7th annual session:

1. **Lifetime Achievement Award** (Above 55 years of age)
2. **Hon. Fellowship/ Fellowship** (FGESA)
3. **Dr. APJ Abdul Kalam Green Environment Promotion Award**
4. **Dr. Sarvepalli Radhakrishnan Education Promotion Award**
5. **Chaudhary Charan Singh Award for Agricultural Innovations**
6. **Sardar Patel Glocal Award for Social Awareness**
7. **Lal Bahadur Shastri Glocal Award for Biodiversity**
8. **Senior Scientist Award** (Above 40 years of age)
9. **Best Faculty Award for Teaching/Research Innovations**
10. **Distinguished Service Award / Distinguished Teacher Award** (Crop, Plant Protection, Horticulture, Fisheries, Home Science, Social Science, Animal Science, Life Science etc.)
11. **Innovative Educationist Award/ Agriculture Extensionist Award**
12. **Teacher of the Year / Extension Professional of the Year /Doctor of the Year Award**
13. **Technological Innovations Award**
14. **Paryavaran Ratna Puraskar**
15. **Vigyan Bhushan Puraskar**
16. **Sahitya Shri Samman**
17. **Young Scientist/Young Researcher Award** (Below 35 years of age)

Note: Life Membership of GESA is mandatory for above awards. Each awardee receives a multicoloured award certificate, a potted plant, an angvastram and a high quality memento. GESA Award selection is mainly based on biodata. Those who have received GESA awards during 6th ICES are not eligible to apply. For detailed guidelines, please log on to website: <http://www.gesa.org.in> [Email id: officegesa1@gmail.com].

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Abstracts

**7th International Conference on
ENVIRONMENT AND SOCIETY (ICES 2025)**

Theme: CLIMATE CHANGE: MITIGATION AND
ENVIRONMENTAL ETHICS FOR HUMAN WELL-BEING

6 & 7 December, 2025

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**REACTIVE NITROGEN EMISSIONS:
CHALLENGES IN A CHANGING ATMOSPHERE**

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ABSTRACT

Emissions of gases and particulate matter from agricultural operations can impact human and ecological health and can contribute to global atmospheric greenhouse gas accumulation. As farmers respond to increasing demands for food, feed, fiber, and fuel, the potential environmental and health risks increase. Agricultural air quality is an important emerging area of environmental science, which offers significant challenges to many aspects of research, policy and regulatory authorities. Improvements are needed in measurements, modeling, emission controls, and farm operation management, apart from socio-economic aspects of food production. Controlling emissions of gases and particulate matter from agriculture is notoriously difficult as this sector affects the most basic need of humans, i.e. food, and policies combine an inadequately known science covering a very disparate range of activities in a complex industry with social and political overlays. Moreover, agricultural emissions derive from both area and point sources. Given the serious concerns raised regarding the amount and the impacts of agricultural air emissions, ways must be found to make real progress in reducing these environmental impacts. Agricultural emissions produce significant local and regional impacts, such as odor, Particulate Matter (PM) exposure, eutrophication, acidification, and exposure to toxics, and pathogens. Agricultural emissions also contribute to the global problems caused by greenhouse gas emissions. Agricultural emissions are variable in space and time and in how they interact within the various processes and media effected. Most important in the US are ammonia (where agriculture accounts for ~90% of total emissions), reduced sulfur (unquantified), PM_{2.5} (~16%), PM₁₀ (~18%), methane (29%), nitrous oxide (72%); and odor and emissions of pathogens (both unquantified). Agriculture also consumes fossil fuels for fertilizer production and farm operations, thus emitting carbon dioxide (CO₂), oxides of nitrogen (NO_x), sulfur oxides (SO_x) and particulates. Current research priorities include the quantification of point and non-point sources, the biosphere-atmosphere exchange of ammonia, reduced sulfur compounds, volatile organic compounds, greenhouse gases, odor and pathogens, the quantification of landscape processes, and the primary and secondary emissions of PM.

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Abstract No. 2

**ETHICAL DIMENSIONS OF CLIMATE CHANGE MITIGATION:
ENSURING SUSTAINABILITY AND HUMAN WELFARE**

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ABSTRACT

Climate change stands as one of the most critical global challenges of the 21st century, endangering ecological integrity, public health, food security, and overall human well-being. It continues to heighten risks across ecosystems, agricultural and food systems, public health, and the broader fabric of human welfare. Addressing these challenges requires an integrated approach that blends scientific mitigation strategies with a strong foundation of environmental ethics. This paper examines “Climate Change Mitigation and Environmental Ethics for Sustainable Human Well-Being” through the specific theme of ethical responsibility in climate action and the transition toward sustainable development. It evaluates major mitigation pathways including decarbonization, renewable energy transitions, climate-resilient resource management, and biodiversity conservation while emphasizing the ethical principles of intergenerational justice, ecological stewardship, equity, and shared global responsibility. By linking ethical reasoning with climate science, the study demonstrates how value-based frameworks enhance public engagement, policy implementation, and long-term resilience. The findings highlight that climate change is not solely an environmental or technological crisis but a profound ethical challenge requiring collective moral commitment. The paper concludes by advocating for integrative, equitable, and sustainable approaches to climate governance to safeguard the well-being of present and future generations.





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Abstract No. 4

**ENVIRONMENTAL CHALLENGES IN URBAN WATER
STATUS AND ITS NATURE BASED SOLUTION**

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ABSTRACT

The exploring urban population growth creates unexcelled challenging task, among which provision for water status and other related to typical concern of waste water. These problems have enormous consequences on human health and wellbeing, environmental safety, economic growth and development. The lack of adequate water concern practices and continuous influx of untreated sewage carry enormous amount of pollutants and typical toxicants, leading to profuse growth of invasive phytoplankton and faced urban population jeopardizes. Physico-chemical and bio-hydrological factors played most important role for water quality status. The amount of nutrient and toxins (bio-toxins) were dynamically influenced with water availability, flow and positively depicted WQI and complex urban water scenario. The occurrence of contamination, moderate to undesirable pollutants, carcinogenesis and Volatile compounds (VOCs) concentration are comprehended the complexity of urban water system especially waste water remediation. The urban water quality mainly dependent on the encounter of water supply and treatment practices. The stack monitoring (point source, line source, fugitive) approach play an essential role for advancing scientific knowledge in urban water status and its security. The highest enumeration phytoremediation/toxin producing algal species (TPAsp.) have highly correlated with biomass, Chl-a, and daily seasonal carbon flow of a system, forms the basis for the structure of the annual pyramid of waste water budget. Photosynthetic bacteria (oxygen evolving) proved current prospective of Nature-based solutions (NBS) for remediation of emerging pollutants in wastewater.

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Abstract No. 5

**ROLE OF TRIBAL INDIGENOUS KNOWLEDGE AND
BIODIVERSITY CONSERVATION IN BANGLADESH**

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Mudeel, Mudcrab, Aquaculture and Management Centre, Bangladesh
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ABSTRACT

A nation's vast biodiversity is a hidden treasure that is vital to long-term development, well-being, and economic success. Protecting biodiversity is crucial in light of the current conditions of species loss, soil erosion, seed sterility, and climate change. If nothing is done, the situation is dire and could lead to extinctions, including human ones. Tribal communities and indigenous tribes are strongly related to environment and rely on it for their livelihoods. They protect plants and animals; they are not exploiters. The traditional knowledge that these indigenous tribes possess is very beneficial to a nation; it also supports indigenous traditional medicine, customs, ecological knowledge, and economic growth. The knowledge, which is the cornerstone of the nation's primary healthcare system and has grown in popularity recently, is referred to as the Traditional System of Medicine or Alternate System of Medicine. The rights of indigenous populations should be upheld, and the urban class should gain from the information they contribute. There are roughly 45 distinct ethnic groups that call Bangladesh's tribal areas - mainly the Chittagong Hill Tracts, Sylhet, Rajshahi, and Mymensingh provinces - home to an estimated two million people. Despite having legally guaranteed cultural rights, the tribes, who identify as "Adivasi," still face economic, social, and human rights challenges.



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Abstract No. 6

ENVIRONMENTAL ETHICS AND OUR RESPONSIBILITY

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ABSTRACT

Ethics is the study of human conduct and moral principles that guide behaviour. While environmental studies examine the interactions between humans and their surroundings, environmental ethics specifically investigates the moral relationship between human beings and the natural world. It focuses on the values, duties, and moral standing of both the environment and its non-human components. Environmental ethics provides a framework for understanding and addressing issues such as overpopulation, environmental degradation, and sustainability. By promoting awareness across societies, it encourages individuals to adopt responsible and ethical lifestyles that contribute to global well-being. The field encompasses diverse themes including conservation and restoration, environmental justice, ecofeminism, climate change ethics, green political theory, technological ethics, and environmental activism. Environmentalism, as a broader philosophy, includes multiple theories, ecosystems, and social movements aimed at protecting life in all its forms. Since all living beings are integral parts of the biosphere, ethical and moral values should extend beyond human interactions to include the treatment of animals and nature. The collective goal is to create a cleaner, safer, and more sustainable environment. This responsibility lies with everyone—teachers, students, families, and communities alike. Environmental ethics forms the moral foundation for protecting the planet. Each individual bears the duty of environmental responsibility, which involves preventing pollution, using natural resources wisely, restoring ecosystems, and safeguarding the Earth for future generations. Neglecting these responsibilities threatens not only biodiversity but also human survival. Therefore, inculcating environmental ethics from an early age is essential to nurture a sense of stewardship among younger generations. From a utilitarian perspective, environmental ethics asserts that our moral responsibilities toward the environment stem from our obligations to humanity itself. Environmental degradation ultimately harms people for instance; pollution endangers human health making the protection of nature both a moral and practical necessity.

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Abstract No. 7

**CLIMATE RESILIENT COMMUNITIES: INTEGRATING
LOCAL MITIGATION STRATEGIES FOR IMPROVED
HUMAN WELLBEING**

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ABSTRACT

Climate change is one of the biggest global challenges today. It affects environmental stability, social and economic systems, and overall human well-being. Rising temperatures, extreme weather, and resource depletion make community-level solutions more important. This study looks at climate-resilient communities by examining how local practices—like using renewable energy, managing waste sustainably, planting trees, and practicing climate-smart agriculture—boost long-term human well-being. The paper shows that good mitigation strategies not only lower greenhouse gas emissions but also improve public health, secure livelihoods, strengthen social ties, and ease climate-related anxiety. By drawing on successful global examples and Indian community efforts, the study highlights the need to combine scientific knowledge with local practices to build resilience. The findings suggest that involving communities through planning, training programs, green infrastructure, and policy support can greatly improve resilience and quality of life. The paper concludes that climate mitigation works best when it is local, inclusive, community-focused, and fits into broader development goals.

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Abstract No. 9

**NATURAL RESOURCES AND
SUSTAINABLE DEVELOPMENT**

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ABSTRACT

All the resources available from Nature for maintenance and sustainability of ecosystem and human population are called Natural resources. They are basically of two types: Non- renewable and renewable resources. The increasing economic activity is now threatening the very existence of man due to problems of scarcity of natural resources and continues degradation of natural resources in the environment. The contemporary meaning of development is the continuous development of the entire society and social system of better conditions or towards more human conditions. Development is the process of qualitative changes and quantitative growth of the social and economic growth of the social and economic reality which we called society. Fulfilment of the basic needs, participation, self-esteem, life sustenance and freedom from servitude are some of the characteristics of development. Need for conservation of living resources to achieve sustainable development.

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Abstract No. 10

**CLIMATE CHANGE AND BIODIVERSITY CONSERVATION IN
THE INDO-NEPAL TARAI REGION: CHALLENGES AND
STRATEGIES FOR SUSTAINABLE MANAGEMENT**

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ABSTRACT

The Indo-Nepal Tarai region, a transboundary lowland ecosystem extending across the Himalayan foothills, represents a critical hotspot for biodiversity and natural resources. Home to rich alluvial forests, agricultural productivity, and vulnerable wildlife corridors, the Tarai is increasingly facing the dual threats of climate change and anthropogenic pressures. This paper explores the impact of rising temperatures, erratic rainfall, and shifting cultivation patterns on the biodiversity and ecosystem services of the Indo-Nepal Tarai. Special focus is placed on Balrampur district (India) and adjacent Nepali provinces where deforestation, flooding, and invasive species have been notably aggravated by climate-induced changes. Using a combination of field data, satellite imagery, and policy analysis, the study identifies key trends in land-use change, forest degradation, and species vulnerability. Case studies from community forest initiatives and cross-border conservation programs illustrate both the potential and limitations of current efforts. The paper also assesses the effectiveness of Indo-Nepal bilateral environmental agreements, emphasizing the need for integrated transboundary strategies that involve local stakeholders, traditional knowledge systems, and adaptive conservation planning. The research concludes by proposing a multi-sectoral framework for biodiversity conservation that addresses climate resilience, livelihood diversification, and cross-border governance. With global climate targets in mind, the Indo-Nepal Tarai must be recognized as a priority landscape for climate-smart conservation and sustainable development.

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Abstract No. 11

**EVALUATION OF GROUNDWATER–SURFACE WATER
INTERACTION IN MINING-AFFECTED ZONES OF SOHAGPUR
COALFIELD, DISTRICT SHAHDOL MP, INDIA**

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ABSTRACT

The Sohagpur Coalfield in District Shahdol, Madhya Pradesh, India represents a critical mining zone where extensive coal extraction activities have significantly altered the natural hydrological balance between groundwater and surface water systems. The study encompasses primary data collection from 45 monitoring wells and 12 surface water bodies across the coalfield, supplemented by secondary data analysis from government agencies and mining corporations. Hydrochemical parameters including pH, electrical conductivity, total dissolved solids, heavy metals, and coal-derived contaminants were analyzed to understand the extent of mining-induced modifications to natural water systems. Results indicate significant groundwater depletion in active mining zones with average water table decline of 2.3 meters annually, coupled with deteriorating water quality characterized by elevated sulfate concentrations (450-680 mg/L) and heavy metal contamination exceeding permissible limits (1). Surface water bodies show seasonal fluctuations with reduced baseflow contributions from groundwater, particularly during post-monsoon periods when groundwater-surface water exchange rates decreased by 35-40% compared to pre-mining conditions (2). The research establishes a comprehensive understanding of mining-induced alterations to hydrological systems, providing critical insights for sustainable water resource management and environmental restoration strategies in coal mining regions of central India.

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Abstract No. 12

**NEP 2020 AND ITS ROLE IN FOSTERING ENVIRONMENTAL
AWARENESS AND SUSTAINABILITY**

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ABSTRACT

India's National Education Policy- 2020 presents a forward-looking framework that seeks to transform education by embedding environmental consciousness and sustainable practices across all levels of learning. The policy places significant emphasis on promoting environmental literacy through active learning approaches, such as hands-on projects, nature-based activities, and local ecological initiatives. At the school level, NEP encourages the incorporation of eco-friendly practices—like waste segregation, water conservation, and tree planting—into everyday learning. It also promotes a cross-disciplinary approach to understanding environmental challenges by integrating sustainability concepts into science, social studies, and vocational subjects. In higher education, the NEP calls for a flexible, multidisciplinary curriculum that includes environment-related subjects, regardless of a student's primary area of study. It advocates for mandatory environmental studies courses, project work focused on local ecological issues, and community outreach programs that connect students with real-world sustainability efforts. These elements aim to develop critical thinking, problem-solving skills, and a sense of ecological responsibility among students. This paper explores how NEP 2020 promotes environmental awareness and sustainability within the education system. It analyzes policy goals, examines current implementation practices, and identifies gaps that need to be addressed for the policy to succeed. The study also offers recommendations to strengthen institutional capacity, enhance curriculum delivery, and foster stronger community involvement to achieve India's long-term sustainability goals through education.



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Abstract No. 13

**WATER FOOTPRINT ASSESSMENT AND AQUIFER
PROFILE TOWARDS HUMAN WELL-BEING**

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ABSTRACT

Water footprint (WF) is a tool to estimate water consumption by humans and the available fresh water. WF focused on how anthropogenic activity impacted in the quantity and quality of sediments deposition and pattern in water channel and geochemical environment. The physical and chemical characteristics of surface/ spring and well water samples were examined for two years fluctuation in 2022–2024 in the downstream river way of Ganga at south eastern Prayagraj city. The ionic speciation and minerals dissolution/ precipitation were calculated. Water wells, characterizing ground water circulation at shallow depths are moderate to high mineralized waters of Na-HCH₃. In contrast to the shallow environment, the CO₂-rich, deeper water of the Ca-HCO₃-SO₄ type and undergoes significant changes in the baseline chemistry along flow lines with increasing residence time. The heavy metal concentration ranged between 18.61-29.14, 03.14 -09.91, 51.25 -78.08, 34.29 -23.49, 0.18- 0.72, 21.26- 22.60 and 10.72- 13.44 mg/kg for Co, Cu, Cr, Cd, Ni, Zn and Pb, respectively. Geo-accumulation index was noted between (0 and 2, class 2) which showed that sediment was contaminated to moderately contaminated and may have adverse affects on freshwater ecology of the river specially post flow. There were analyzed green-to-blue water footprint ratio i.e. 0.7-010. Mathematical equation were also derived the hydro geological variables for better understanding of the study area, hence proper management strategies are required to control the direct discharging of wastewater in the river flow in way of zero-discharge and ecological integration towards human well-beings.

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Abstract No. 14

**EVALUATION OF IBUPROFEN TOXICITY ON BLOOD
BIOCHEMISTRY OF FRESHWATER FISH *CYPRINUS CARPIO***

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ABSTRACT

Water is essential for the biosphere on our planet to function healthily life for every organism and mechanical process. In the present study, the most commonly employed pharmaceutical drug, Ibuprofen was administered to a freshwater fish, *Cyprinus carpio*, for 28 days using a static bioassay approach to determine its toxicological effects. For this study, the median lethal concentration (LC_{50}) of Ibuprofen in the fish *C. carpio* was calculated 0.234 ml/L after 24, 48, 72 and 96 hours in four sets of aquariums with six fishes in each. In order to do further investigation, the four sets of aquariums in each six mix gender fishes were given sublethal concentration 1/10th of LC_{50} i.e., 0.023 ml/l for 7,14,21 and 28 days. After the exposure the fish showed changes in behaviour like mucus secretion, jerky movements. Changes in fish physiology were observed. Serum glucose level was found increased during the study period 7,14,21 and 28 days, compared controls. In contrast, serum protein, albumin, globulin, cholesterol, triglycerides, HDL and VLDL levels were observed decreased in level, while LDL level increases during the study period. Ibuprofen exposure revealed drastic changed in biochemical parameters due to liver and renal dysfunction, gluconeogenesis to provide energy for the higher metabolic demands imposed by Ibuprofen stress, altered serum enzyme activities, reduced HDL level due to lipid peroxidation. More extensive studies on these individual biomarkers, however, are required to analyse the effects of human pharmaceutical drug in the fields of pharmacotoxicology and aquatic toxicology.

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Abstract No. 15

**INDIAN PHILOSOPHICAL TRADITIONS AS FOUNDATIONS
FOR ECOLOGICAL SUSTAINABILITY**

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ABSTRACT

The escalating ecological challenges of the present era—ranging from climate instability and resource depletion to biodiversity decline—demand approaches that go beyond technological interventions and embrace ethical, cultural, and value-based perspectives. Indian philosophical traditions offer a timeless foundation for ecological sustainability by promoting balance, interdependence, and respect for all forms of life. The Vedic principle of “Vasudhaiva Kutumbakam” (the entire world as one family) and the Upanishadic idea of the unity of Atman and Brahman provide a worldview where humans are not separate from, but integral to, nature. The doctrine of the Pancha Mahabhuta (five elements—earth, water, fire, air, and space) highlights the interconnectedness of ecological systems and calls for harmony in human interaction with the environment. Core ethical values such as Ahimsa (non-violence) and Aparigraha (non-possessiveness), articulated in Jain, Buddhist, and Yogic traditions, emphasize compassion towards all beings and a minimalist approach to consumption. Similarly, the Buddhist concept of Pratityasamutpada (dependent origination) resonates strongly with ecological systems thinking, underlining the interdependence of life and environment. Ancient Indian practices like sacred groves, river reverence, and eco-centric rituals served as community-driven models of conservation that preserved biodiversity and safeguarded natural resources. These traditions were not confined to philosophy alone but were woven into daily life—through Gurukul education in natural surroundings, seasonal festivals tied to agrarian cycles, and architecture rooted in ecological sensitivity. Therefore, Indian philosophical traditions provide enduring ethical and cultural insights that remain highly relevant for addressing today's environmental crisis. They illuminate pathways toward sustainable living, where development aligns with ecological balance and universal well-being.

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Abstract No. 16

**VERMIREMEDIATION EFFICIENCY OF *LAMPITO MAURITII*
IN HEAVY METALS DETOXIFICATION FROM
ORGANIC WASTE SUBSTRATES**

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ABSTRACT

Heavy metals are highly toxic and pose serious risks to human health, animals, and soil ecosystems. Environmental safety and sustainable recycling of waste depend on effective methods for reducing their concentrations in organic waste. In this research, the vermiremediation effectiveness of the anecic earthworm *Lampito mauritii*, which is known to bioaccumulate heavy metals in its yellow tissues, is analyzed. Heavy metal concentrations in the initially prepared feed mixture, the resulting vermicompost, and the earthworm body tissues were measured using various combinations of animal dung and kitchen waste (KW) as substrates. Cobalt (Co), nickel (Ni), and cadmium (Cd) concentrations in all organic waste mixtures significantly decreased after vermicomposting with *Lampito mauritii*. Additionally, the earthworm's body tissues accumulated more Co and Ni in the buffalo dung + KW (1:3) and buffalo dung + KW (1:1) mixtures, respectively, by 2.71% and 12.40%. Earthworms cultured on goat dung substrates showed the highest Cd accumulation (0.42% , 61.899 ± 0.005 mg/kg). These results indicate that *Lampito mauritii* serves as both an effective species for heavy metal sequestration during vermicomposting and a natural biomarker. Besides reducing heavy metal levels in the final vermicompost, this process also supports sustainable kitchen waste management and reduces the risk of metal contamination entering the food chain.

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Abstract No. 17

**HUMAN-WILDLIFE CONFLICT IN KUMAON HIMALAYA:
INSIGHTS FROM ALMORA'S FOREST DIVISIONS**

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ABSTRACT

Human–wildlife conflict (HWC) poses significant challenges to conservation and community well-being, particularly in Himalayan regions where human settlements and wildlife habitats overlap. Scarcity of food and water in forests, driven by poor management, resource depletion and climate change is reshaping ecological niches. Many species are shifting habitats— marine organisms moving poleward, and high-altitude species like the pika retreating higher into colder zones, with those at the highest limits facing survival threats. At the same time, human population growth and agriculture-driven deforestation bring people and wildlife into closer contact, intensifying conflicts and habitat degradation. The findings highlight persistent human–leopard conflict, rising threats from other species, and the role of habitat loss, food scarcity, and human encroachment as key drivers. Addressing these requires integrated measures such as habitat restoration, buffer zones, equitable compensation, community participation, and non-lethal mitigation to foster coexistence in the Himalayas.

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Abstract No. 18

**EMPOWERMENT AND INTEGRATION OF INDIGENOUS
WOMEN'S TRADITIONAL ECOLOGICAL KNOWLEDGE
IN TO GLOBAL SUSTAINABILITY**

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ABSTRACT

India is a land of vast biodiversity and tribal communities constitute about 8.6% of the country's total population. This research article focuses on the contribution of indigenous women as curator and transmitter of Traditional Ecological Knowledge (TEK) and overviews their empowerment and integration in to global sustainable development. Tribal communities are extensively the best conservationists; they have managed their lands sustainably for countless generations. Even though indigenous women's traditional ecological knowledge is unquestionably treasured in fostering community sustainability and climate resilience, their contributions are underappreciated in conventional development discourses. This article explores the critical divergence in research and practice, how tribal women, with their strong ties to land and resources, enact sustainable environmental practices like forest conservation, water management, and biodiversity protection, employing traditional ecological knowledge.

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Abstract No. 19

**A COMPARATIVE STUDY OF WATER QUALITY ASSESSMENT
OF KANKE DAM, HATIA (DHURWA) DAM AND GETALSUD
(RUKKA) DAM IN RANCHI, JHARKHAND, INDIA**

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ABSTRACT

This paper presents the comparative study of water quality assessment of three water bodies. The study was done from Sept 2021 – Aug 2023. The sample was collected from the three sites of Kanke Dam, Hatia (Dhurwa) Dam and Getalsud (Rukka) Dam in Ranchi, Jharkhand. The major population of Ranchi depends on these three dams, the Kanke Dam, Hatia (Dhurwa) Dam and Getalsud (Rukka) Dam, as these are the major of drinking water supplier, so it becomes very essential to monitor the water quality at regular interval of time. The samples were collected from various parts of the 3 different dams and the analysis was carried out on the parameters such as Hydrogen ion Concentration (pH), Dissolved Oxygen, Total Alkalinity, Chloride, Sulphate, Phosphate, Organic matter, Ammonical Nitrogen, Nitrate Nitrogen and Silicate. The range of various parameters of water of all the three water bodies were as Hydrogen ion Concentration (pH)(6.1 – 8.7), Dissolved Oxygen(4.3 – 10.7), Free Carbon-di-oxide (0.55 –7.37), Total Alkalinity (25.8 – 97.0), Chloride (9.5 –78.9), Sulphate (17.75 - 36.55), Phosphate (0.072 – 0.540), Organic matter (0.140 – 0.670), Ammonical Nitrogen (0.013 – 0.159), Nitrate Nitrogen (0.085 – 0.329) and Silicate (0.20 – 0.98).

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Abstract No. 20

**ASSESSMENT OF HMF FORMATION AND DIASTASE
ACTIVITY VARIATION UNDER DIFFERENT STORAGE
CONDITIONS IN APIS MELLIFERA HONEY FROM
NORTH MAHARASHTRA, INDIA**

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ABSTRACT

The current study focused on examining how different storage durations affect the levels of hydroxymethylfurfural (HMF) and diastase activity in *Apis mellifera* honey from the Khandesh region of India. To evaluate HMF and diastase activity, honey samples were kept at room temperature ($28 \pm 3^\circ\text{C}$) for 3, 6, 9, and 12 months and then analyzed. The findings revealed that storing honey for 9 and 12 months negatively impacted HMF concentration and diastase activity compared to storage for 3 and 6 months. The duration of storage increased the HMF content while reducing diastase activity. Specifically, the HMF content increased from 35.54 ± 3.41 to 45.72 ± 2.41 mg/kg over the 3-to 12-month storage period, indicating an increase in HMF levels with longer storage. Diastase activity decreased from 22.24 ± 1.21 to 14.19 ± 2.17 DN, suggesting enzyme deactivation due to prolonged storage. Consequently, it was concluded that honey storage can influence HMF content and diastase activity, thereby diminishing honey quality and its shelf life. However, ensuring suitable production and storage conditions can help maintain honey quality and enhance its market value.

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Abstract No. 21

**IMPACT OF TANNERY EFFLUENT ON EARTHWORM
MORPHOLOGY AND SOIL HEALTH**

Anjali and Eshita Pandey

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ABSTRACT

Tannery effluents contain high organic load, salts and toxic levels of heavy metals and pose serious risk to both soil quality and soil fauna. Earthworms as ecosystem engineers and sensitive bio-indicators provide critical insights into effluent toxicity through their morphological and ecological responses. Scientific studies where earthworms of different species when exposed to graded concentrations of tannery effluent-contaminated soils in acute exposure describe abnormalities, including surface discoloration, excessive mucus, coelomic fluid secretion, segmental swelling, and cuticular lesions. Prolonged exposure leads to clitellum degeneration, body shrinkage, loss of turgidity, weight reduction, and cuticle erosion. In concurrence soil analysis indicated reduced microbial activity, slower organic matter decomposition, disrupted pH balance, and heavy metal gathering, resulting in declines in soil absorbency, aeration, aggregation, and nutrient cycling. The combined findings highlight that morphological alterations in earthworms are not only direct biomarkers of tannery effluent toxicity but also early indicators of broader soil ecosystem degradation.

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Abstract No. 22

**E-WASTE POLLUTION: A GROWING THREAT TO
ECOSYSTEM AND PUBLIC HEALTH**

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ABSTRACT

Electronic waste (E-Waste) is the fastest growing municipal waste stream worldwide containing hazardous substances (heavy metals, persistent organic pollutants, flame retardants) and valuable recoverable materials. Every year millions of old or broken gadgets like mobile phones, computers, and TVs are discarded. Improper handling, informal recycling and uncontrolled disposal releasing harmful chemicals such as lead, mercury and cadmium and brominated flame retardants into the environment, causes serious threat to both ecosystem and human health. These toxic substances contaminate the soil, air and water that affects ecosystem, affecting plants, animals, microorganism and harming human health particularly in low and middle income region. Human exposure to e waste through direct contact or through contaminated food chains often suffer from respiratory problems, skin diseases and even serious health challenges like neurological disorders, kidney damage and other chronic health problems. Uncontrolled burning of e- waste releases green house gases and particulate matter which increases air pollution and causes climate change. Developing nations, often lacking efficient waste management system, are particularly vulnerable to these adverse impacts. This study emphasizes the urgent need for sustainable e- waste management practices, including eco-friendly recycling, public awareness and strict rules to mitigate environmental degradation and protect public health. Addressing e-waste pollution is essential for achieving environmental sustainability and safe guarding future generations.

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Abstract No. 23

**BIOCHEMICAL AND HISTOLOGICAL
RESPONSES IN FRESHWATER FISHES**

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ABSTRACT

This study investigates the physiological impacts of environmental stressors on freshwater fish species from Manorama River. The study focuses on *Labeo rohita*, *Catla catla*, and *Channa punctata* as model species. Through an analysis of biochemical and histological biomarkers, we examined the effects of exposure to various pollutants, such as pesticides, heavy metals, and industrial effluents, on critical tissues including the gills, liver, and kidneys. Biochemical assays measured changes in key parameters, including antioxidant enzyme activities (e.g., superoxide dismutase, catalase), markers of oxidative stress (e.g., lipid peroxidation), and metabolic indicators (e.g., protein, glucose, and enzyme levels). Concurrently, histological analysis revealed tissue-level damage, such as cellular necrosis, hypertrophy, hyperplasia, degeneration, and inflammation. The findings demonstrate that environmental contamination leads to significant alterations in the biochemical profiles and tissue architecture of freshwater fish. These integrated multi-biomarker responses serve as sensitive and reliable early warning signals for assessing aquatic ecosystem health.

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Abstract No. 24

**ISOLATION AND CHARACTERIZATION OF THE MICROBES
FROM THE WATER SAMPLES OF THE GANGETIC RIVER
SYSTEM, RIGHT AT IT SOURCE TO THE END POINT, WITH
SPECIAL REFERENCE TO HUMAN HEALTH**

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ABSTRACT

Water is one of the most vital natural resources and essential to a nation's socioeconomic growth. Waterborne pathogens result in around 4% of all deaths and emergence of antimicrobial resistance in the pathogens is a global concern. Rivers continue to be the primary source of surface water, nonetheless. About 252.8 million hectares make up the whole catchment area of India's many big, medium and minor rivers. The Indian subcontinent's largest river basin is the Ganga (Ganges) basin. It originated in the state of Uttarakhand and occupies more than one-fourth of the nation's land area. In this study, 17 water samples across the River Ganga, were collected to evaluate the Ganga River's diversity of bacterial species from Uttarakhand to the West Bengal, India. 22 bacterial isolates were identified through different biochemical tests in the water samples, and were subjected to eight antibiotics of different classes to check the susceptibility. 9 out of 22 bacterial isolates were found to have resistance against the broad-spectrum antibiotic. It was observed that the bacterial species reduces with the movement of water in the river course indicating the self-cleansing nature of river Ganga. It was also observed that the river water in the downstream of STP contains different types of enteric bacterial species, and absent in upstream samples, indicating requirement of improvement in the disinfection of STP treated water.

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Abstract No. 25

**HISTOPATHOLOGICAL AND HISTOMORPHOMETRIC
EVALUATION OF DOSE- DEPENDENT TOXICITY OF
ALOE-VERA EXTRACT IN *CHANNA MARULIUS***

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ABSTRACT

The present study evaluates the dose-dependent toxic impact of Aloe vera extract on *Channa marulius*, (Saur) emphasizing histopathological and histomorphometric responses. Experimental fish were exposed to varying concentrations of Aloe vera extract (0 mg/L, 5 mg/L, 10 mg/L, and 20 mg/L) for different exposure periods (1 hour, 6 hours, 12 hours, and 24 hours). Microscopic examination revealed progressive and concentration-dependent tissue alterations in the gills, liver, and kidneys, characterized by epithelial lifting, lamellar distortion, hepatocytic vacuolation, and glomerular shrinkage at higher doses. Histomorphometric measurements further confirmed these structural disruptions through a notable reduction in epithelial and cellular thickness in affected organs. Although Aloe vera is widely known for its therapeutic and antioxidant potential, excessive concentrations were found to trigger cytotoxicity and oxidative stress in *Channa marulius*. (Saur) The findings suggest that careful regulation of Aloe vera dosage and exposure duration is essential for ensuring its safe application in aquaculture practices and fish health management.

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Abstract No. 26

**UTILIZATION OF FENUGREEK AS A SUSTAINABLE
NATURAL RESOURCE NUTRACEUTICAL AND
ITS PHARMACEUTICAL VALUE**

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ABSTRACT

Food is essential for the sustainable development of life, and nature provides it to us abundantly in numerous variety and quantity. Health is directly dependent on the food we intake. A lot of research is being done on therapeutic diets and their nutraceutical and pharmaceutical properties. Foods like millets, green leafy vegetables and several spices are re-emerging for their nutritional and pharmaceutical values. Several natural foods are also used for the development of drugs. Fenugreek is one of most sustainable food crops which are in use since ancient time, as in Harrapan civilization, ancient Roman and Greek civilization. In Ayurveda Fenugreek is used for its medicinal properties. Recent scientific studies show that Fenugreek seeds are rich in steroidal saponins which help to slow carbohydrate digestion, reduce blood sugar level and amend hyperglycaemia. It is high in soluble dietary fibre which helps reduce LDL cholesterol levels. It also contains flavonoids and phenolic acids which provide antioxidants, control inflammation and are anti-inflammatory, and possibly have anti-carcinogenic benefits.

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Abstract No. 27

**ESSENTIAL OILS (EOS) EXTRACTION AND
THEIR FREE RADICAL SCAVENGING ASSAY**

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ABSTRACT

Nowadays, much attention has been given to natural antioxidants because of their involvement in human health as health promoters and anti-aging agents. Plant essential oils (EOs) are well known for their source of various bioactive compounds such as terpenoids, alkaloids, and phenolics, which contribute to their antioxidant potential. In the present study, we extract EOs from leaves of three different plants, namely *Catharanthus roseus*, *Cymbopogon* sp., and *Leucas aspera* by using a Clevenger's hydro-distillation apparatus. The recovered EOs were kept in Amber-coloured glass for further studies. Subsequently, free radical scavenging activity of EOs was performed by DPPH (2,2-diphenyl-1-picrylhydrazyl) assay. Ascorbic acid is used as a standard antioxidant. The photometric analysis was performed by using UV-Visible spectroscopy at a wavelength of 517nm. Our results showed, *Catharanthus roseus* essential oil (CREO) exhibits the highest antioxidant potential and was close to that of ascorbate, followed by *Cymbopogon* sp. essential oil (CEO). Whereas *Leucas aspera* essential oil (LAEO) exhibits the least antioxidant potential. The present findings suggest that the variation in the antioxidant potential of plant EOs may be potentially linked to the proportion of their phytochemical composition. These EOs may be used as a promising source of natural antioxidants.

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Abstract No. 28

**GREEN TECHNOLOGY INNOVATIONS FOR
WASTE MANAGEMENT**

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ABSTRACT

India has environmental issues related to waste generation, collection, transit, treatment and disposal. Rapid industrialization and population growth in India have led to the generation of hundreds of tons of waste per day and proper waste disposal is still a serious concern. This research addresses various types of wastes, such as industrial, agricultural, and municipal solid and liquid wastes, their generation, and the status of waste management. It discusses advanced green technologies used in harnessing energy and by products from wastes such as electricity, biofuel, biopolymers, fertilizers, and chemicals without damaging the quality of the environment, but rather creating a source that is an added value to the environment. Key technologies discussed include advanced recycling methods, bioconversion processes, waste-to-energy systems, and digital tools for efficient waste tracking and management. Advanced recycling techniques, such as chemical recycling and automated sorting, are highlighted for their ability to reclaim valuable materials and reduce landfill dependency. Bioconversion processes, including anaerobic digestion and composting, are presented as sustainable options for organic waste treatment, offering waste reduction and renewable energy production. Waste-to-energy technologies, such as incineration with energy recovery and thermal conversion methods, are evaluated for their effectiveness in reducing waste volumes while generating clean energy. It aims to inform and inspire stakeholders to adopt more sustainable waste management practices, driving the transition toward a cleaner, greener future.

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Abstract No. 29

**INFLUENCE OF ENVIRONMENTAL
STRESS ON HORMONE RECEPTORS**

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ABSTRACT

Hormone receptors sense and respond to environmental stress. They play an important role in maintaining homeostasis and health. Stress receptors serve as key biological mediators that detect and respond to environmental stressors and link external conditions to internal physiological reactions. Glucocorticoid receptors (GR), adrenergic receptors, and mineralocorticoid (MR) receptors, play a crucial role in activating the body's stress response. They translate external stress signals like extreme climate, pollution, and crowding into hormonal releases (cortisol, adrenaline), neural signalling and cellular reactions via the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic nervous system for adaptive responses. Chronic activation can lead to dysregulation, immune suppression, metabolic disorders, and mental health challenges. These stress responses regulate physiological and behavioural reactions to adapt to external stress. Present research focussed on molecular biology techniques, neuroimaging and controlled environmental studies can help to understand environmental changes and their influence on receptor expression and stress resilience. These inferences can help mitigate harmful effects of stress by promoting adaptive hormonal responses.

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Abstract No. 30

**A STUDY ON DIVERSITY OF ENDOPHYTIC
FUNGAL ASSEMBLAGES AND THEIR ROLE IN
BIOSYNTHESIS OF SILVER NANOPARTICLES (AGNPS)
IN *TINOSPORA CORDIFOLIA***

**Gulam Ahmad Siddique¹, Suraj Singh¹, Arvind Kumar¹,
Rajiv Ranjan², Veer Pratap Singh² and Deepak Kumar Singh¹**

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ABSTRACT

Nowadays, the demand for biogenic synthesis of metal nanoparticles (NPs) is driven by its significant advantages over conventional chemical and physical methods, primarily regarding environmental sustainability and biocompatibility. Endophytes and their derived NPs is growing field of research that combines microorganisms living within plants with nanotechnology for application in agriculture and medicine. In present study, we isolate and purified the endophytic fungi from stem of *Tinospora cordifolia*. We also assess the biocompatibility of recovered fungal strain in the biosynthesis of silver nanoparticles (AgNPs). The AgNPs were partially characterized by UV-Visible spectroscopy. In the current investigation, five endophytic fungal strains namely *Aspergillus elegans*, *Aspergillus ochraceus*, *Penicillium* sp., *Aspergillus tubingensis*, and *Chaetomium globosum* were recovered and morphologically identified. The fungal strains *Chaetomium globosum* and *Penicillium* sp. have successfully synthesised AgNPs with sharp absorbance at wavelength of 427nm and 442nm, respectively. Whereas, *Aspergillus elegans*, *Aspergillus ochraceus*, and *Aspergillus tubingensis* exhibits the insignificant results. The present findings suggest that the variation the metabolic properties of the fungal strains and biochemical composition of their filtrate may be potentially linked to synthesis of AgNPs.

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Abstract No. 31

**EFFECT OF ACUTE PESTICIDE STRESS ON EXPRESSION
OF mRNA OF PROGESTERONE RECEPTOR**

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ABSTRACT

Pesticides are extensively exploited in agriculture but have the capacity to function as endocrine-disrupting chemicals. Every organism from invertebrates to vertebrates including humans are exposed to these chemicals easily via environmental sources; soil, water and air. Environmental factors also play a crucial role in human pathogenicity. Pesticide exposure has been linked with menstrual irregularities, premature menopause, infertility, and disrupted oocyte maturation. They trigger disruption of steroid hormone biosynthesis and receptor signalling, oxidative stress, inflammation, and epigenetic changes thus compromising ovarian function. Acute pesticide exposures can quickly impact cellular gene regulation, particularly in the gonads. Progesterone production is regulated by vital steroidogenic genes whose expression of mRNA is sensitive to disruptions within the cellular environment. Taking into account the seriousness of the effect the study aimed to check the acute food toxicity response on the m-RNA expression of Progesterone Receptor. The sample collected after the completion of experimental study was subjected to RT-PCR technique. It was used to check the expression levels and the findings suggest that acute exposure of pesticide negatively influenced the gene expression of progesterone receptor.

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Abstract No. 32

**EVALUATION OF GROUNDWATER QUALITY AND
SUITABILITY FOR DRINKING, AGRICULTURAL AND
INDUSTRIAL USES IN THE VARANASI DISTRICT OF
UTTAR PRADESH, INDIA**

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ABSTRACT

A total of 70 water samples were collected from the Varanasi district of Uttar Pradesh and analysed for the physicochemical parameters to determine their suitability for drinking, agricultural, and industrial uses. The groundwater was alkaline, with a pH value ranging from 7.31 to 7.70. The EC values ranged from 389 to 1210 $\mu\text{S}/\text{cm}$, and TDS varied from 226 to 833 mg/L in the Varanasi district. The Mg^{2+} and HCO_3^- were the dominant cation and anion, respectively, in the Varanasi district. The groundwater suitability for drinking water was determined using the Water Quality Index (WQI) value, which ranged from 113 to 466 during the study period. Based on the WQI value, the groundwater quality in Varanasi district was unsuitable for drinking purposes. The agricultural suitability of the Varanasi district was determined using the Sodium Absorption Ratio (SAR), Na%, Magnesium Hazard (MH), and Kelly Index (KI). The values of these different indices indicated that most of the groundwater samples were suitable for irrigation purposes. The industrial suitability of the Varanasi district groundwater was determined using the Langelier Saturation Index (LSI) and Ryznar Stability Index (RSI). Both LSI and RSI values indicated that water samples were unsuitable for industrial use due to their corrosive and scale-forming nature.

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Abstract No. 33

**AQUATIC INSECTS AS BIO- INDICATORS IN
RAMGANGA RIVER AT MORADABAD**

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ABSTRACT

Abstract – Aquatic insects may consider model organisms in analysing the structure and function of the freshwater ecosystems. Environmental contamination research has been interesting in bioindicators recently. The basic objective of bioindicators research is to find species that can reliably detect environmental disturbances and demonstrate how those disturbances affect other species or biodiversity as a whole since they frequently come into contact with the harmful substance found in water insects are particularly valuable for evaluating how human activities affect the aquatic ecosystems and atmosphere. Ramganga river exhibit high magnitude of pollution due to indiscriminate disposal of water by large number of industrial units and sewage waste are being discharge either land an in the river Ramganga Moradabad has led to raped deterioration in the river quality of aquatic in Moradabad. Class insects have Diptera, Odonata, Trichoptera, coleoptera, Hymenoptera. Water insects or aquatic beetle are biological indicators. Aquatic insects have been our main focus since they indicators of change in water.

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Abstract No. 34

**EXPLORING THE ANTI-INFLAMMATORY AND SUSTAINABLE
POTENTIAL OF CLITORIA TERNATEA FOR HEPATIC HEALTH**

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ABSTRACT

Inflammation is a natural immune response to injury or infection but can be regulated with through anti-inflammatory agents. Phytochemical extracts, rich in bioactive compounds like flavonoids and alkaloids, offer promising natural alternatives by modulating inflammatory pathways, reducing oxidative stress, and promoting tissue repair with minimal side effects. The current study will evaluate the anti-inflammatory activity of *Clitoria ternatea* (Aparajita) extract on a hepatocyte cell line from Indian Knowledge System (IKS). In Ayurveda, all parts of *Clitoria ternatea* like stem, root and flower is claimed to protect the liver and are found to have anti-inflammatory and anti-oxidant properties in liver related diseases. Hydroalcoholic extracts of flower were tested on in-vitro hepatocyte models which were under oxidative stress. The extracts have the potential to reduce inflammatory markers and enhance cell regeneration. Liquid Chromatography–Mass Spectrometry (LC–MS) analysis identified a total of 60 bioactive compounds including several pharmacologically significant anti-inflammatory agents. The medicinal properties and biocompatibility of the plant provide strong evidence to support its applications in eco-sustainable pharmaceuticals.

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Abstract No. 35

**IMPACT OF EXTREME CLIMATE ALTERATIONS ON
HUMAN HEALTH: A META ANALYTICAL STUDY**

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ABSTRACT

The impact of climate change on human health is a topic of critical importance and is of utmost significance. In the past decade a lot of attention is being paid on impact of recent climate changes on human health which has gained attention that immediate action is necessary to minimize this impact. In the present study, we have outlined a subset of these effects in detail. We have examined how climate change has worsened respiratory allergic disease and exacerbated the mental and cardiovascular health. It is discussed at length, how climate change has altered antigen exposure, possibly disrupting antigen-specific tolerance by the immune system, leading, in turn, to an increase in the prevalence of immunologic diseases. Finally , an attempt has been made to assess the loss of biodiversity related to climate change that may affect the microbiome, potentially leading to dysbiosis, inflammatory, autoimmune and neurologic diseases.

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Abstract No. 36

**PHYTO-DIVERSITY AND THEIR ROLE IN ATTENUATION
OF DUST POLLUTION IN AND AROUND OPENCAST
MINING AREAS OF BUNDELKHAND REGION OF
UTTAR PRADESH, INDIA**

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ABSTRACT

Opencast mining, a very important economic activity in many countries especially developing world today including India, causes significant environmental degradation in and around the vicinity of mining areas. In the current investigation an attempt has been made to identify the floristic composition in and around of two selected opencast granite mines each of Jhansi and Lalitpur district belonging to Bundelkhand region of Uttar Pradesh, India. Present study revealed that there are a total of 96 species belonging to 39 different families from which maximum plant species found from Fabaceae family i.e. 16 species followed by Poaceae (07spp); Rutaceae (06spp) and so on. The existing species which are growing in such fragile environment and some are having dust scavenging nature may useful for greenbelt in mining areas to combat the air pollution.

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Abstract No. 37

**ASSESSMENT OF SEASONAL VARIATIONS IN
PHYSICOCHEMICAL PARAMETERS OF GANGA RIVER
WATER AT ADALPURA AND CHUNAR IN THE
VARANASI REGION**

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ABSTRACT

The Ganga River, one of India's most vital freshwater systems, faces increasing ecological stress due to urbanization, industrialization, and agricultural runoff. This study investigates the seasonal variation in key physicochemical and heavy metal parameters at two major sites — Adalpura and Chunar — to evaluate water quality in relation to BIS and WHO standards. Surface water samples were collected during pre- and post-monsoon seasons and analyzed for pH, electrical conductivity (EC), turbidity, alkalinity, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), and selected heavy metals (Pb, Cd, As, Cr). The results revealed significant spatial and temporal fluctuations. pH remained within the permissible range (6.5–8.5), while EC, TDS, and turbidity values consistently exceeded the standards, particularly at Chunar, indicating high ionic load and suspended particulates due to industrial effluents and domestic discharges. Although DO levels improved slightly after the monsoon, elevated BOD and COD values persisted, reflecting substantial organic and chemical contamination. Heavy metals such as Pb, Cd, and As were detected above safe limits, with maximum concentrations recorded during the pre-monsoon period at Chunar, signifying cumulative pollution from anthropogenic sources. Comparatively, Adalpura exhibited relatively better water quality, though it also showed deviations from safe thresholds. The findings highlight the urgent need for rigorous pollution control measures, continuous monitoring, and community-based river management to restore the ecological integrity and sustainability of the Ganga River.

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Abstract No. 38

**BIOACTIVE COMPOUNDS OF MUSHROOMS AND
THEIR ROLES IN DISEASE CONTROL**

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ABSTRACT

Mushrooms are increasingly recognized as valuable reservoirs of bioactive compounds with significant potential in disease control and human health management. They produce a wide spectrum of secondary metabolites, including polysaccharides, β -glucans, phenolic compounds, terpenoids, lectins, sterols, and alkaloids, which contribute to diverse pharmacological activities. Polysaccharides, particularly β -glucans, are well-documented for their immunomodulatory and antitumor properties by enhancing host immune responses and stimulating macrophage and natural killer cell activity. Phenolic compounds and terpenoids exhibit potent antioxidant and anti-inflammatory functions, reducing oxidative stress and mitigating chronic disease risks such as cardiovascular disorders and diabetes. Additionally, mushroom-derived lectins and sterols show promising antimicrobial, antiviral, and antifungal activities, positioning mushrooms as natural alternatives for combating multidrug-resistant pathogens. Certain compounds, such as lentinan from *Lentinula edodes* and polysaccharide-K (PSK) from *Trametes versicolor*, are clinically utilized as adjuvant therapies in cancer treatment due to their immune-stimulatory properties. Moreover, bioactive metabolites from mushrooms play roles in regulating blood glucose, lowering cholesterol, and protecting against neurodegenerative diseases, thereby broadening their therapeutic potential. With rising global interest in functional foods and nutraceuticals, mushrooms provide an eco-friendly and sustainable source of natural bioactives that can complement conventional medicines. Their integration into diet and therapeutic applications offers a promising strategy for disease prevention, control, and overall health promotion.

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Abstract No. 39

**ROLE OF MUSHROOM IN SUSTAINABLE
ENVIRONMENT AND AGRICULTURE**

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ABSTRACT

Mushrooms, as a diverse group of macrofungi, play a pivotal role in promoting sustainability in both environmental management and agricultural systems. They function as natural decomposers by recycling organic matter, thus enhancing soil fertility and structure through the breakdown of lignocellulosic biomass. This contributes to nutrient cycling and improves the bioavailability of essential minerals for crop production. In agriculture, mushrooms are increasingly recognized for their role in sustainable waste management, as they can utilize agro-industrial residues such as straw, husks, and sawdust as substrates, thereby reducing environmental pollution and adding value through edible biomass production. Beyond food security, mushrooms also provide functional bioactive compounds with antimicrobial, antioxidant, and immunomodulatory properties, contributing to human health and nutraceutical industries. Their integration into farming systems as part of agroecological practices promotes circular bioeconomy models by converting low-cost wastes into high-value products, including biofertilizers, animal feed, and soil amendments. Additionally, mushroom-based bioremediation techniques have demonstrated efficacy in mitigating environmental contaminants such as heavy metals, pesticides, and hydrocarbons, aligning with global climate resilience strategies. The role of mushrooms in carbon sequestration, soil health improvement, and ecosystem restoration further underlines their significance in addressing the challenges of climate change and sustainable agriculture. Thus, mushroom husbandry embodies a dual benefit: supporting food and nutritional security while simultaneously ensuring ecological sustainability. Harnessing mushroom biotechnology and its integration with modern agricultural practices offers a promising pathway toward achieving United Nations Sustainable Development Goals (SDGs) related to food, health, and environmental protection.

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Abstract No. 40

**ENVIRONMENTAL ETHICS AND HUMAN RESPONSIBILITIES:
DEVELOPMENT IN FUTURE**

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ABSTRACT

The problem of ecology in these times is becoming more acute every day. An environmental problem is a change in the natural environment that leads to disruption of the functioning and structure of nature. Global problems are generated by the contradictions of social development, affecting the surrounding world by a sharply increased scale of human activity. Also associated with the un even scientific, technical and socio-economic development of countries and regions. From the point of view of modern scientists, humanity lives in a world where everything is already collapsing. Dealing with current environmental problems is an ongoing process that requires the collective effort of individuals, communities and governments. By working together and implementing sustainable methods and technologies, we can create a better future for ourselves and for future generations. The protection of environment is needed for sustainable development. The Industrial pollution, degradation of forests, depletion of ozone layer, the green house gases results in global warming and climate which will have an adverse impact on environment and human health. There is a need for conservation of Biodiversity, protection of wetlands and prevention of environmental pollution, promotion of ecological balance enables sustainable development. There are several provisions provided in Indian Constitution for Protection of environment. There are certain legislations enacted viz. Environment Protection Act, Wildlife Preservation Act, Biodiversity Conservation Act, water and Air pollution prevention Acts etc The Judiciary playing a vital role in protection of Environment.

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Abstract No. 41

**SEASONAL INFLUENCE ON THE LIFE CYCLE OF
SILKWORMS AND ITS EFFECTS ON SILK PRODUCTION**

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ABSTRACT

The silkworm (*Bombyx mori* L.) is a poikilothermic insect, meaning its body temperature and biological functions depend on the surrounding environment. Because of this, changes in season strongly influence its growth, development, and silk production. This study explores how summer, monsoon, and winter conditions affect different stages of the silkworm's life cycle, from larval growth to cocoon formation and silk quality. Rearing was carried out under similar feeding and care conditions to focus on the effects of temperature and humidity alone. The observations showed that the moderate climate of the monsoon season provided the most favorable environment for healthy growth and high-quality cocoons, while extreme heat in summer and low temperatures in winter led to slower development and reduced productivity. Understanding the poikilothermic nature of silkworms and how they respond to seasonal changes can help farmers and researchers adopt better rearing practices. Such knowledge supports improved silk yield, enhances cocoon quality, and contributes to sustainable sericulture under changing climatic conditions.

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Abstract No. 42

**GAMMA-INDUCED ENHANCEMENT OF OIL YIELD AND
CHEMOTYPIC VARIATION IN VARIETY CIM-MOHAK OF
SPEARMINT (*MENTHA SPICATA* L.)**

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ABSTRACT

Spearmint (*Mentha spicata* L.) is valued worldwide for its carvone-rich essential oil, yet its commercial potential is constrained by limited oil yields. To address this, we applied gamma irradiation ((10, 20, 30, 50, 70, and 90 Gy) on suckers of the high-performing variety CIM-Mohak, aiming to unlock superior genetic variants. The LD₅₀ was established at 20 Gy, with survival rates declining predictably at higher doses. In the irradiated populations, 30 Gy emerged as the optimal dose, delivering maximum oil content (0.57%) with improved oil yield (about 25% increases over the control). Key traits viz. herb yield, oil yield, canopy spread, and plant height exhibited high heritability (>85%) and strong genetic advance (>22%), indicating strong selection potential. Correlation and path-coefficient analyses underscored fresh herb yield and oil content as the dominant drivers of oil productivity. Mahalanobis D² clustering revealed 11 distinct groups with substantial inter-cluster divergence, highlighting novel chemotypes enriched in limonene (up to 15.4%), menthol (up to 12.0%), and acetate esters while maintaining carvone stability (66%). Five elite mutants, combining superior biomass, oil yield, and refined oil composition, were advanced for stability trials. These findings demonstrate gamma irradiation as a powerful, targeted strategy for developing high-yielding, quality-enhanced spearmint variety to meet rising global demand.

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Abstract No. 43

**CHROMIUM EXPOSURE FROM OCCUPATIONAL AND
NON-OCCUPATIONAL SOURCES INDUCES OXIDATIVE
STRESS AND DNA DAMAGE IN THE POPULATION
NEAR KANPUR TANNERIES**

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ABSTRACT

The chrome tanning process is widely used in the tannery industry in India. Tannery workers are directly exposed to chromium (Cr) compounds due to inadequate safety protocols and insufficient awareness. This study aimed to assess oxidative stress and DNA damage in Kanpur tannery workers exposed to Cr at work and in their environment. Blood samples were collected from the residents of Jajmau, Kanpur, India. The participants were categorised into three groups: Group I comprised 100 individuals with occupational exposure to Cr in tanneries. Group II included 100 individuals living near tanneries but not exposed to Cr through their occupation. Group III comprised 100 healthy individuals with no history of chromium exposure. The chromium levels in all blood samples were measured using inductively coupled plasma-mass spectroscopy (ICP-MS). Oxidative stress was quantified by measuring the concentrations of malondialdehyde (MDA), reduced glutathione (GSH), and superoxide dismutase (SOD). A comet assay was employed to assess DNA damage, and comet tail lengths were measured in both the exposed and control groups. The levels of Cr, MDA, SOD, and DNA damage were significantly higher in the exposed groups than in the control groups ($P < 0.001$), whereas the GSH levels were notably lower ($P < 0.001$). The results of this research emphasise the urgent need to swiftly identify the adverse effects of Cr on tannery workers to lessen health hazards and reduce exposure.

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Abstract No. 44

**BIODIESEL: A SUSTAINABLE ALTERNATIVE
TO FOSSIL FUELS**

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ABSTRACT

The rapid depletion of fossil fuel reserves, coupled with escalating environmental concerns, has accelerated the global search for renewable and eco-friendly alternatives to conventional energy sources. Biodiesel, a renewable, biodegradable, and non-toxic fuel derived primarily from vegetable oils, animal fats, and waste cooking oils through the process of transesterification, has emerged as a viable substitute for petroleum-based diesel. Unlike fossil fuels, biodiesel offers significant environmental benefits, including lower emissions of greenhouse gases, particulate matter, carbon monoxide, and sulphur oxides, thereby mitigating the adverse impacts of climate change and air pollution. Moreover, its biodegradability reduces risks of soil and water contamination in the event of spills. From a socio-economic perspective, biodiesel production promotes rural development by creating opportunities for farmers to cultivate non-edible oilseed crops on marginal lands, enhancing agricultural sustainability and income security. The utilization of waste oils and fats further supports circular economy principles by minimizing environmental burden. Additionally, biodiesel is compatible with existing diesel engines with minimal modifications, making it an economically feasible transitional fuel in the ongoing shift towards cleaner energy. However, large-scale implementation of biodiesel faces challenges such as feedstock availability, competition with food crops, land-use changes, and relatively higher production costs. These limitations highlight the importance of technological innovations, including the development of second- and third-generation feedstocks such as microalgae, jatropha, and other non-food biomass, which offer higher yields and reduced ecological footprints.

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Abstract No. 45

**THREATENED TAXA OF PILIBHIT TIGER RESERVE,
PILIBHIT, UTTAR PRADESH**

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ABSTRACT

The plants diversity of India are approximately more than 45,000 species but due to rapid urbanization, agriculture and industrial development, destruction of forests causes extinction of several Indian plants. About 1,336 plant species are considered vulnerable and endangered. About 20 species of higher plants are categorized as possibly extinct as these have not been sighted during the last 6-10 decades. The threat status of plants has extensively described as per IUCN guidelines and an inventory of endangered plants have been published in the form of Red Data Book (India Book-2020, a reference annual). A number of plant species are useful for livelihood of human being. Present study is focused on threat status of native flora in Pilibhit Tiger Reserve (PTR) Pilibhit, Uttar Pradesh. Threatened species are those species or organisms whose existence is in danger due to natural as well as artificial (by human activities) reasons. The natural causes responsible for endangering plants are droughts, floods, earthquake, landslides, storm, avalanches as well as diseases. Besides, threats also include invasion of exotic, aggressive weeds, air pollution, water pollution and lack of pollinators. On the other hand artificial/ human activities threats include industrialization, urbanization, increasing township, dams, grazing, commercial exploitation, internal tourism, mining and so on. Over exploitation of plants also leads to destruction of their habitat. Pilibhit Tiger Reserve vegetations are also suffering with these calamities. Some examples which are in endangered condition in Pilibhit Tiger Reserve, Pilibhit, Uttar Pradesh are, *Olax nana*, *Uraria picta*, *Grewia sclerophylla*, *Grewia sapida*, *Erythra resupinata* etc.

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Abstract No. 46

**INTEGRATED APPROACHES TO BIODIVERSITY,
WATER, AND WILDLIFE MANAGEMENT FOR
SUSTAINABLE ECOSYSTEM RESILIENCE**

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ABSTRACT

The interconnectedness of biodiversity, water resources, and wildlife management is critical for maintaining ecosystem stability and ensuring sustainable development. Healthy ecosystems rely on diverse species, balanced hydrological cycles, and effective conservation practices to mitigate the impacts of climate change, habitat loss, and human-induced pressures. This paper explores integrated management strategies that combine ecological restoration, watershed protection, and wildlife habitat conservation. It highlights case studies where community participation, technological innovations, and policy frameworks have successfully enhanced biodiversity while ensuring efficient water resource utilization and safeguarding wildlife populations. Emphasis is placed on ecosystem-based approaches, adaptive management, and cross-sectoral collaborations as essential tools to promote resilience in fragile landscapes. The study further identifies research gaps and recommends holistic practices for future conservation planning. The findings contribute to global dialogues on sustainable natural resource management, offering insights applicable to both terrestrial and aquatic ecosystems across diverse geographical contexts.

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Abstract No. 47

**POLLEN SPECTRUM VARIABILITY AS AN INDICATOR OF
CLIMATE CHANGE AND BIODIVERSITY CONSERVATION**

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ABSTRACT

Melissopalynological analysis of honey was conducted from ten densely vegetated areas of the Ganga plain in Uttar Pradesh across four seasons viz. Spring, Summer, Rainy and Winteras to prepare pollen spectrum and to assess its variability as an indicator of climate change and to explore its implications for ecosystem stability and human well-being. The study emphasizes the value of melissopalynology in understanding floral diversity, phenological shifts and honey bee foraging behavior under changing climatic conditions. Pollen composition in honey serves as a sensitive bioindicator of environmental variability; linking vegetation dynamics with pollinator responses. Honey samples collected from these localities during different seasons were analyzed using Erdtman Acetolysis Method. A wide range of pollen types were identified, including dominant arboreal taxa such as *Azadirachta indica*, *Bombax ceiba*, *Caesalpinia pulcherrima*, *Syzygium cumini*, Anacardiaceae etc. and non-arboreal taxa comprising of Asteroideae, Cichorioideae, Solanaceae, Malvaceae, *Ziziphus* sp., *Brassica campestris*, *Coriandrum sativum* etc. Their frequency during different seasons were calculated and plotted to prepare pollen spectrum. Despite the floral richness of Ganga plain, the samples displayed limited pollen diversity, indicating selective foraging behavior of honey bees modulated by seasonal and climatic variations. These melissopalynological evidences effectively reflects climate-induced foraging shifts of pollinator, offering insights into ecosystem resilience, sustainable agriculture, and human well-being. This study underscores the importance of integrating palynological data to climate monitoring and adaptation strategies for biodiversity conservation in climate-sensitive regions.

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Abstract No. 49

**STUDY ON THE DOCILITY PATTERN OF
NILGAI (*BOSELAPHUS TRAGOCAMELUS*)
IN THE GOPALGANJ DISTRICT OF BIHAR**

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ABSTRACT

Nilgai is a hoofed ungulate and largest antelope in Asia. It is endemic to peninsular India having prominent sexual dimorphism and partially gregarious in nature. The present paper deals with the study conducted on the docile behaviour pattern of Nilgai in the Gopalganj district of Bihar. The method followed was direct sighting and observation using camera photography, questionnaire method, survey cum direct conversations with the local inhabitants. The local village population were not well acknowledged with the docile behaviour of the Nilgai. It was observed that Nilgai was very comfortable with cattle, grass egret. If possible this docility can be harnessed for beneficial purpose to mankind.

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Abstract No. 50

**WATERSHED CONSERVATION AS A CATALYST
FOR BIODIVERSITY PRESERVATION**

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ABSTRACT

Watersheds represent critical ecological systems that regulate water cycles, maintain soil productivity, and sustain diverse habitats essential for biodiversity. However, widespread deforestation, agricultural intensification, industrial pollution, and unplanned urbanization have led to severe watershed degradation, resulting in habitat loss, declining water quality, and diminishing species richness. This study explores the role of watershed conservation as a holistic approach to biodiversity preservation and long-term ecosystem resilience. Healthy watersheds support a wide range of species by maintaining hydrological balance, nutrient cycling, and natural filtration processes. Restoration efforts—such as reforestation of catchment areas, wetland rehabilitation, and sustainable land-use planning—directly enhance habitat quality while ensuring reliable water resources for human and ecological needs. Case studies from tropical and semi-arid regions demonstrate measurable benefits, including improved fish populations, revival of amphibian breeding grounds, and increased pollinator diversity. The research also highlights the importance of community participation, where local stakeholders contribute through participatory water governance, soil conservation techniques, and indigenous ecological knowledge. Advanced tools such as GIS mapping, hydrological modelling, and biodiversity monitoring are increasingly applied to assess watershed health and inform decision-making. Policy integration remains essential for scaling conservation efforts. Incentive-driven mechanisms like payment for ecosystem services (PES), biodiversity credits, and watershed protection funds encourage sustainable practices among farmers, industries, and local communities. This study concludes that watershed conservation serves as a cornerstone for biodiversity protection, climate adaptation, and water security. By aligning ecological restoration with socio-economic benefits, integrated watershed approaches offer a pathway toward achieving global conservation targets and ensuring ecosystem resilience.

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Abstract No. 51

**BALANCING NUTRITION, SAFETY, AND SUSTAINABILITY:
THE ROLE OF NATURAL RESOURCE MANAGEMENT
IN FOOD SYSTEM**

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ABSTRACT

To guarantee global food security, interconnected food systems must balance environmental sustainability, food safety, and nutritional adequacy. This study examines the critical role that natural resource management plays in achieving this balance through the sustainable use of soil, water, biodiversity, and energy resources. The study emphasizes how effective use of these resources improves food yield and quality while lowering risks to ecological degradation and public health. Using case studies and recent research, the study investigates how cutting-edge technology, waste reduction, and sustainable farming practices enable reliable and secure food systems. It also acknowledges regulatory frameworks, stakeholder collaboration, and community-based initiatives as essential means of integrating sustainable principles into food systems. In the end, this study emphasizes the necessity of a multifaceted strategy that synchronizes sustainability, safety, and nutrition objectives in order to encourage long-term environmental stewardship and provide fair access to nutritious food for both current and future generations.

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Abstract No. 52

**SPICE DERIVED ESSENTIAL OILS
AS PRESERVATIVES IN FOOD SYSTEM**

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ABSTRACT

The demand of safe foods with little or no artificial preservatives is one of the foremost leading challenges for food manufacturing industries. Traditionally, essential oils extracted from the aromatic plants used as spice, serving as natural preservatives in food systems by inhibiting microbial growth and oxidation to extend the shelf life of raw as well as stored food material. These oils offer a sustainable alternative to synthetic preservative which severe negative effects on human health and this increased consumer demand for safe food products and evoke the various food storage and packaging industries to use green and nature origins preservatives in place of chemical preservatives for the production of safe foods. Further, essential oils derived from spice are rich in various phytochemicals viz., terpenes, alcohol, aldehyde and phenolic compounds. These diverse compounds display significant biological activities such as antioxidant and antimicrobial without altering the sensory properties of food and food product. Nevertheless, their poor solubility in water and volatility limit their applications. To overcome these constraints, encapsulation is one of the best approaches to overcome the volatility limitation and also preserve the biological activities of spice and spice derived essential oil. Herein, we have comprehensively enlightened the encapsulated spice essential oil to improve the physical—chemical and antimicrobial stability and application in stored the food systems.

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Abstract No. 53

**ENVIRONMENTAL ETHICS AND HUMAN
RESPONSIBILITIES IN THE VAAYU PURANA**

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ABSTRACT

The *Vayu Purana* presents environmental ethics as an integral part of Dharma, linking ecological care with spiritual duty. It teaches that the natural world is a manifestation of the divine, and therefore must be treated with reverence. The *Purana* describes the five elements—earth, water, fire, air, and space—as sacred foundations of life that humans must protect. It emphasizes that air (vayu) is not merely a physical substance but a cosmic principle sustaining all beings. Because vayu nourishes life, the text instructs humans to maintain purity of air through righteous living and avoidance of harmful activities. The *Purana* also highlights the interdependence of humans and nature, stating that harming the environment ultimately harms oneself. It explains that polluting rivers, forests, or the atmosphere leads to decline in health, prosperity, and spiritual harmony. The text praises those who plant and protect trees, considering them benefactors of humanity and supporters of cosmic balance. It warns that the destruction of forests invites drought, famine, and ecological imbalance caused by disrupted natural cycles. The *Vayu Purana* encourages the practice of Tapas (austerity) and simplicity to reduce over consumption of natural resources. It teaches that gratitude to nature should be expressed through rituals, offerings, and respectful use of resources. Human beings are instructed to avoid violence against animals, recognizing all creatures as part of the same universal breath. The *Purana* states that rulers and householders have a special responsibility to preserve water bodies, ensuring clean and abundant water for all. It views environmental protection as an extension of ahimsa, where non-harm includes caring for ecosystems and biodiversity. Ultimately, the *Vayu Purana* asserts that protecting nature is essential for maintaining Rta, the cosmic order, thereby ensuring the wellbeing of present and future generations. The *Vayu Purana* is one of the oldest *Puranas* and contains significant teachings on the environment, five elements, forests, water bodies, animals, and ecological morals. It closely associates *dharma* with environmental protection.

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Abstract No. 54

**MODULATION OF BEHAVIOUR AND OXIDATIVE
PHYSIOLOGY OF BRAIN AND LIVER OF RATS BY
INDIAN CLASSICAL MUSIC**

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ABSTRACT

The exposure of stress triggers oxidative imbalance and behavioural disturbances by elevating reactive oxygen species (ROS) and disrupting neurophysiological homeostasis. Music, as a non-invasive auditory stimulus, has been increasingly recognized for its therapeutic potential in modulating neurobehavioral and biochemical parameters. The raga-based compositions of Indian Classical music possess unique tonal structures that may influence emotional and physiological responses through neuroendocrine regulation. The present study investigated the modulatory effects of Indian classical instrumental music on the behavior and oxidative stress biomarkers of Wistar albino rats (*Rattus norvegicus*) exposed to heat stress. Twenty adult male rats were divided into 4 groups viz., A. Control, B. Stress, C. Stress+Music, D. Music. Heat Stress ($40 \pm 0.5^\circ\text{C}$) was induced through a Bioincubator chamber for three alternate days, while the music-exposed groups were subjected to daily sessions of Indian classical instrumental music (60–70 dB, 2 h/day) for 15 days. Behavioural assessments viz., open field test, elevated plus maze, radial 8 arm maze and footprint analysis were performed to evaluate locomotor and anxiety-like responses. Oxidative stress markers viz., lipid peroxidation (LPO), superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx) were quantified in brain and liver of rats. It was observed that the stress + music exposure group markedly ameliorates behavioural abnormalities and restored antioxidant enzyme activities in response to control group. The findings suggest that structured musical interventions can serve as a non-invasive strategy for managing stress-related physiological dysfunctions.

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Abstract No. 55

IMPORTANCE OF BIODIVERSITY AND ITS CONSERVATION

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ABSTRACT

Biodiversity simply refers to the different varieties of plants and animals present on the earth. Biodiversity is a crucial component of the Earth's natural resources that underpin economic, social, and cultural development. We have a rich ecosystem with diverse flora and fauna, but its biodiversity is constantly threatened by human activities such as deforestation, pollution, land-use change, and climate change. So it is our moral responsibility to conserve our biodiversity. The conservation of biodiversity means to protect animals, plants and other ecosystem services such as soil fertility, pollination, and climate regulation. Diverse ecosystems are resilient against disasters such as floods or droughts. Human wellbeing is closely tied to biodiversity, as it ensures food security, advances medicine, and supports agriculture. Loss of biodiversity can disrupt the food chain, reducing natural resistance to diseases and disasters. Biodiversity stabilizes the ecosystem. Each biotic and abiotic component plays an important role in stabilizing and contributes to the overall functioning of the system. The loss of a species can disrupt the balance and lead to negative consequences such as reduced productivity, limited resilience, and increased vulnerability to diseases. In conclusion, biodiversity is a crucial component of natural resources that provides numerous benefits to its people. Therefore, there is a need to promote conservation policies and practices that ensure the sustainable development.

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Abstract No. 56

**DIFFERENTIAL TOXICOLOGICAL IMPACT OF SYNTHETIC
AND BIOGENIC METAL NANOPARTICLES ON FISHES:
A REVIEW**

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ABSTRACT

Nanoparticles (NPs) are particles of a size between 1 and 100 nm. Metal oxide nanoparticles (NPs) are used very significantly these days in various products like cosmetic industry, biomedical waste, electronic and paint factories due to their unique intriguing properties, establishing antimicrobial features as well. This comprehensive review highlights both synthetic and biogenic nanoparticles, focusing on their toxic effects on aquatic fish and their antimicrobial activity against various bacterial strains. The study suggests that biogenic nanoparticles, being less toxic, could serve as a safer alternative to synthetic ones. Their antimicrobial properties also offer benefits for applications in biomedicine, cosmetics, water purification, and food preservation. The current findings indicate that more research is needed to explore additional properties of green-synthesized ZnO nanoparticles in different aquaculture applications and across various fish species. It is also important to develop strategies to ensure their safety, minimize negative effects, and assess any potential risks to human health. Significant research opportunities remain in the biogenic synthesis of nanoparticles using plants such as duckweed and Satawari. Further studies are required to fully understand their long-term effects.

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Abstract No. 58

**EVALUATION OF OXIDATIVE STRESS RESPONSE TO
DETERGENT IN FRESHWATER CAT FISH
MYSTUS VITTATUS (BLOCH)**

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ABSTRACT

Fish are highly vulnerable to damage caused by reactive oxygen species (ROS). Under normal physiological conditions, their cells maintain an efficient antioxidant defense system that balances the production and elimination of ROS. However, when ROS generation exceeds the capacity of the antioxidant defenses, or when these defenses are impaired, oxidative stress occurs, leading to cellular damage. In this context, the present study aims to investigate variations in the activities of key antioxidant enzymes superoxide dismutase (SOD), peroxidase (POD), catalase (CAT), and glutathione S-transferase (GST) in the liver and muscle tissues of *Mystus vittatus* following exposure to sublethal concentrations of detergent. The present study demonstrated a significant increase in the activities of antioxidant enzymes, including SOD, COD, POD, and GST, in fish exposed to detergent. Results from the one-way ANOVA indicated that sublethal and lethal concentrations of detergent had a pronounced effect on the antioxidant enzyme activities in the fish. Furthermore, the post hoc Tukey test revealed notable alterations in SOD, COD, POD and GST levels in response to both sublethal concentrations and different exposure durations. Overall, these findings suggest that *Mystus vittatus* can serve as a potential biomarker of chemical pollution, as reflected by changes in its antioxidant enzyme responses.

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Abstract No. 59

**ENVIRONMENTAL INFLUENCE ON NANOPARTICLE
DRIVEN BLOOD FLOW AND HUMAN HEALTH**

Shruti Gangwar, Shivangi Verma and Madan Lal

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ABSTRACT

The way our body systems react to outside factors-like magnetic fields, temperature changes, and nanoparticles is strongly influenced by environmental conditions. The nanoparticles studied here comes from pollution caused by industries, vehicle emissions and chemical waste. Understanding their movement and interaction within the bloodstream helps assess their potential effects on human health. The study also shows how environmental conditions such as magnetic fields and temperature can affect the body, linking environmental science with human health and well-being. The study investigates the steady flow of blood containing nanoparticles through an inclined, tapered, stenosed artery with a porous wall under a magnetic field. The expressions for flow resistance and wall shear stress are derived using the Homotopy Perturbation Method (HPM). The study highlights the interconnectedness of environmental contamination and human health, supporting pollution mitigation efforts and the sustainable design of nano-materials for safer biomedical use. The study improves understanding of blood flow in narrowed arteries, aiding diagnosis and treatment of cardiovascular diseases. The findings support advancements in magnetic stents, flow regulators, and targeted drug delivery systems using nanoparticles. It also supports the development of better medical devices and drug delivery systems. Overall, it promotes safer and more sustainable use of nano-materials in healthcare, benefiting public health and medical technology.

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Theme: CLIMATE CHANGE: MITIGATION AND
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6 & 7 December, 2025

Abstract No. 61

**ENVIRONMENTAL, SCIENTIFIC AND
SOCIETAL IMPACT CFD-BASED MODELLING**

Jyoti Patel, Shivangi Verma and Madan Lal

Department of Applied Mathematics
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ABSTRACT

Environmental sustainability is enhanced through the use of modelling and simulation, which significantly reduces laboratory waste, chemical usage and energy consumption. Unlike conventional experimental setups that produce biomedical waste and rely on physical materials, Computational Fluid Dynamics (CFD) enables clean and efficient analysis of blood flow in virtual environments. This digital approach supports eco-friendly scientific practices and minimizes the environmental footprint of studies. Scientifically, the work focuses on analyzing blood flow through stenosed arteries using Casson fluid modeling. The governing equations are solved through MATLAB's Bvp5c method for accuracy and stability. Results indicate that magnetic fields and variations in Casson parameters decrease velocity and influence shear stress distribution. This improves understanding of blood flow, heat transfer and magneto-hydro dynamic (MHD) behavior under stenosis. From a societal perspective, this method promotes ethical, non-invasive and cost-effective practices. It reduces dependency on animal testing, lowers research costs and improves accessibility to advanced simulation techniques. Accurate prediction of blood flow behaviour supports better diagnosis and cardiovascular treatment planning, enhancing patient well-being and public trust in healthcare systems.

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Abstract No. 62

THE EFFECTS OF PARASITES ON FISH: A REVIEW

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ABSTRACT

Aquaculture is the world's fastest-growing food production sector, currently contributing about 50% of the global fish supply. By 2030, it is expected to become the primary source of fish for human consumption. Fish an excellent substitute for red meat, fish serves as a rich source of essential amino acids and minerals such as iodine, phosphorus, potassium, iron, and copper, as well as vitamins A and D. In addition, fishes are high in omega-3 fatty acids, which help reduce inflammation in blood vessels and support cardiovascular health. Fish oil contributes to the stabilization of fat deposition, preventing the build up of plaque on arterial walls, thereby reducing the risk of heart disease. Parasitic infections significantly affect the health and productivity of freshwater fishes, leading to alterations in their haematological, biochemical, physiological, and immunological parameters. Changes such as reduced red blood cell count, haemoglobin, and protein levels, along with elevated glucose and liver enzyme activities, indicate stress and organ dysfunction caused by parasites. Seasonal fluctuations and poor water quality often increase the intensity and prevalence of infections. These disturbances not only weaken the immune response but also reduce growth and survival rates, impacting aquaculture yield. Therefore, regular monitoring, proper management practices, and eco-friendly preventive measures are essential to control parasitic infestations and promote sustainable fish farming.

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Abstract No. 63

**ATHEROSCLEROSIS, ENVIRONMENTAL DEGRADATION
AND THE MATHEMATICAL MODELLING ARTERIAL FLOW**

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ABSTRACT

Human comfort often depends on practice that exploits nature. The pursuit of convenience and luxury – without sustainability leads to environmental degradation, threatening both the planet and future human well-being. Heart disease has become very common today, taking many lives around the world. Unhealthy lifestyles, poor diets, stress, pollution, and lack of exercise which strain the heart and blood vessels. The study focuses on how a magnetic field and the porosity (or permeability) of the artery walls affect blood flow when the artery is Stenotic, Tapered and Unsteady. The blood flow through artery was described by Navier – Stokes equations which were presented along with continuity equation and modelled it as a nonNewtonian fluid using the Casson model to stimulate the characteristics of blood flow. The main goal was to calculate and analyze key medical factors: the velocity profile (how fast and where the blood flows), the pressure drop (how much pressure is needed to push the blood past the blockage), and the wall shear stress (the frictional force exerted by the blood on the artery wall). The study's findings can assist clinicians in understanding and anticipating blood flow behavior in arteries affected by atherosclerosis and aid the medical practitioners to predict blood movement in tapered and overlapped stenosed artery.

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Abstract No. 64

**CONDITION FACTOR AND ORGANO-SOMATIC
INDEX OF *MYSTUS VITTATUS* AS BIO-MONITORING
TOOLS OF DETERGENT TOXICITY**

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ABSTRACT

Biomarker or physical indices act as indicator of stress that is somehow affecting the organism ability to grow, reproduce, survive and adapt in a given environment. The present investigation was designed to study the effect of sub-lethal concentration (4.5mg/L and 9.0 mg/L) of detergent on condition factor (CF), hepato-somatic index (HSI) and gonado-somatic index (GSI) of *Mystus vittatus* (8.5±0.2 cm in length and 9.0±1g gm in weight) was studied. Exposure of fish to detergent showed significant ($P < 0.05$) reduction in HSI, GSI and CF in detergent exposed fishes in comparison to control one. The reduced values of above parameters found directly proportional to the detergent concentration and duration of the exposure. Changes in, CF, HSI and GSI might reflect metabolic and physiologic disturbances under the effect of synthetic household detergent. So, changes in these indexes were used to determine and monitor the detergent toxicity in aquatic animals. Thus, this paper gives an overview of the manipulation of fish, *Mystus vittatus* as a biomarker of detergent pollution through alterations in condition factor, hepatosomatic and gonadosomatic index. The results may be used for selective breeding programme, sustainable fishery management and conservation of *Mystus vittatus* in its natural habitat.

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Abstract No. 65

**TARGETTED THERAPY FOR ATHEROSCLEROSIS:
MODELLING MAGNETIC NANOFLUID DYNAMICS
UNDER ENVIRONMENTAL STRESS**

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ABSTRACT

Environmental factors contribute to the hardening of arteries (atherosclerosis) primarily through mechanisms involving inflammation, oxidative stress, and endothelial dysfunction. These factors initiate or exacerbate the buildup of fatty deposits, cholesterol, and cellular waste (plaque) within artery walls, making them thick and stiff. Air pollution, smoke, toxic metal exposure acts as the sources for these factors. Blood flow pattern are very important for finding diseases like arteriosclerosis (hardening of arteries) because of this, bioengineers and medical scientists study how blood moves inside the body's circulatory system .This study is about understanding and controlling blood flow in the body, especially for diagnosing and treating diseases like arteriosclerosis (hardening of the arteries).The study analyzed blood flow inside a vessel that contained tiny magnetic nanoparticles (like small pieces of magnetite or zinc oxide) and shows how different physical forces and effects (like magnetohydrodynamic, Hall effect ,ion slip effect, Brownian motion) influence the blood's movement, temperature, and composition by creating a complex mathematical model (a system of partial differential equations) to represent all these effects simultaneously then solve these equations and see what happens to the blood .The study's findings have significant potential to benefit society by advancing medical treatments, Revolutionizing Targeted Drug Delivery like Precision Medicine, Reduced Side Effects, Enhanced Efficacy, Advancing Therapeutic Hyperthermia ,Improving Circulatory Disease Management (Flow Control, Diagnostic Tools), Driving Bioengineering Innovation.

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Abstract No. 66

**IMPACT OF SUGAR FACTORY EFFLUENT ON RELATIVE
GROWTH RATE AND OXYGEN CONSUMPTION RATE OF
FRESHWATER CATFISH, *CHANNA PUNCTATA* (BLOCH)**

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ABSTRACT

The present study investigated the long-term effects of sublethal concentrations of sugar factory effluent on the freshwater fish *Channa punctatus*, with emphasis on survival rate, relative growth rate (RGR), and oxygen consumption. Using the 96-hour LC_{50} value of 10.56% v/v as a reference, two sublethal concentrations were selected: 1.1% v/v (approximately 1/10th of LC_{50}) and 2.2% v/v (approximately 1/5th of LC_{50}). No mortality occurred at either concentration, indicating complete survival. However, a gradual decline in RGR was observed with increasing effluent concentration and exposure duration. Similarly, oxygen consumption significantly decreased in effluent treated fish, with greater reductions at higher concentrations and longer exposure periods. These results indicate that the chronic toxic effects of the effluent are concentration- and time-dependent.

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Abstract No. 67

**PAPER MILL EFFLUENT TOXICITY ON FISH:
ORGANOSOMATIC INDEX AND CONDITION
FACTOR APPROACH**

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ABSTRACT

Biomarker or physical indices are act as indicator of stress that is somehow affecting the organism ability to grow, reproduce, survive and adapt in a given environment. So, the present investigation has been designed to study the effect of sublethal concentrations (20% and 30%) of paper mill effluent on the health indices like condition factor, hepatosomatic and gonadosomatic index of *Mystus vittatus* after exposure to 30 days. The result of present investigation shows that all the three parameters (HSI, GSI and CF) were decreased significantly ($P < 0.05$) as compared to control. Changes in, HSI, GSI and CF might be reflecting metabolic and physiologic disturbances under the effect of industrial effluent. So, changes in these indexes were used to determine and monitor the industrial effluent toxicity in aquatic animals. Thus, this paper gives an overview of the manipulation of fish, *Mystus vittatus* as a biomarker of industrial effluent through alternation in condition factor, hepatosomatic, gonadosomatic index and oxygen consumption rate.

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Abstract No. 68

**ENVIRONMENTAL LITERACY AS A TOOL FOR MITIGATING
HEALTH RISKS FROM EMERGING CONTAMINANTS**

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ABSTRACT

Emerging contaminants such as microplastics, pharmaceuticals, and per- and polyfluoroalkyl substances (PFAS), novel industrial byproducts, are becoming a serious threat to both human health and the environment. These substances are found in water, soil, and food, and can cause serious health problems, including hormonal changes, immune issues, and some types of cancer. Traditional methods like regulation and technology are helpful but not enough to solve this growing problem. This paper explains how environmental literacy (EL), especially environmental health literacy (EHL), can help people, communities and organizations to understand these risks and take action to protect themselves. The main findings are: (1) Emerging contaminants produce multiple system health effects in the body and often require precautionary and community-based solutions. (2) Environmental health literacy (EHL) strengthens adaptive behaviors, encourages collective action, and supports the use of effective risk-reduction methods. (3) Coordinated strategies combining formal education, clear and customized communication, public participation in research (citizen science) and policy engagement offers the greatest likelihood of reducing exposures and harm. Overall, improving environmental literacy can turn knowledge into action and help create healthier and more sustainable communities.

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Abstract No. 69

**MHD APPLICATIONS IN SUSTAINABLE INDUSTRIAL AND
ENERGY TECHNOLOGY**

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ABSTRACT

Global energy demands, largely met by fossil fuels, are the primary driver of climate change. Significant improvements in heat transfer devices—like those enabled by MHD studies—can reduce energy losses, which in turn leads to lower fossil fuel consumption and a reduction in greenhouse gas emissions. The application mentioned in this study, thermal control in polymeric processing, directly relates to industrial manufacturing. Optimizing these processes via MHD can reduce the energy input required per unit of material produced, contributing to broader industrial energy savings. Investigates how a fluid's movement and temperature change when it flows between two parallel, permeable disks under the influence of a magnetic field. The detailed understanding of flow and heat transfer in a magnetic field gained from study contributes to the development of more energy efficient technologies and cleaner power generation (such as fusion), both of which are critical for mitigating global warming. The study aims to understand the characteristic of flow by the help of Reynolds number, the magnetic parameter and the Prandtl number. This phenomenon has practical importance in lubrication theory, magnetic storage device, mechanical and manufacturing processes, and is beneficial for thermal control in polymeric processing within the industry.

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Abstract No. 70

**EFFECT OF DISTILLERY EFFLUENT ON ANTIOXIDANT
ENZYME OF FISH, *MYSTUS VITTATUS* (BLOCH)**

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ABSTRACT

Industrial effluents are one of the main sources of chemical pollution in water bodies, releasing thousands of harmful substances into the environment. In this study, the freshwater fish *Mystus vittatus* was exposed to two sublethal concentrations (2.5% and 5.0% v/v) of distillery effluent to study their effect on the activity of liver antioxidant enzymes such as catalase, peroxidase, superoxide dismutase, and glutathione S-transferase. The results showed a significant increase in these enzyme activities compared to the control group. The effect was more pronounced as the concentration of effluent and duration of exposure increased. This indicates that industrial effluents contain chemicals or xenobiotics that cause oxidative stress, affecting the health of aquatic organisms. The findings suggest that changes in antioxidant enzyme activity can serve as biomarkers to assess the impact of industrial effluents on fish health and biochemical processes. This study highlights the importance of eco-toxicological assessments of industrial waste and taking steps to reduce its harmful impact on fish populations and freshwater ecosystems. It also points out that such wastewater can disturb aquatic life, so strict rules and proper treatment of industrial effluents are necessary before releasing them into water bodies.

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Abstract No. 71

**OPTIMIZING MAGNETIC NANOPARTICLE TRAJECTORIES IN
A PERMEABLE VESSEL: A CAPUTO-FABRIZIO FRACTIONAL
APPROACH TO ECO-FRIENDLY DRUG DELIVERY**

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Department of Applied Mathematics
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ABSTRACT

Environmental pollution and exposure to toxic materials have been directly linked to rising cases of cancer and cardiovascular diseases. Cancer remains a leading cause of death globally, and the high fatality rate for certain types is a major public health challenge. Conventional drug delivery methods often require high doses that increase systemic toxicity and environmental pharmaceutical waste. Magnetic drug targeting (MDT), inspired by eco-friendly nanotechnology principles, minimizes drug dispersion in the body and reduces chemical contamination during manufacturing and treatment. This study investigates magnetohydrodynamic (MHD) blood flow through a permeable vessel, incorporating Caputo–Fabrizio fractional-order derivatives to simulate memory effects and non-local dynamics of blood motion. The mathematical formulation combines the modified Navier–Stokes equations with magnetic and Darcy permeability terms. The outcomes of this model aim to enhance precision medicine by ensuring efficient, localized drug delivery with minimal side effects. Environmentally, it reduces pharmaceutical pollution, while socially; it lowers healthcare costs and improves life expectancy. By integrating mathematical modelling, environmental consciousness, and medical innovation, this study contributes to a sustainable and healthier society through advanced nanomedical drug-targeting techniques and development of new drug targeting apparatus and treatments.

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Abstract No. 74

**ENVIRONMENTAL EDUCATION,
AWARENESS AND BEHAVIOURAL CHANGE**

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ABSTRACT

There is a close relationship between environmental education, awareness and behavior change, and it is very important for sustainable development. Providing information about the condition and problems of the environment through environmental education, so that individuals can develop an understanding of maintaining balance with nature by using resources appropriately, in another ward making environmental subjects compulsory in educational institutions, organizing tree planting programs and providing information about land, water, air and pollution. Awareness plays an important role in awakening the sensitivity of the society towards environmental problems like climate change, pollution, deforestation etc. and making people responsible towards the environment. In this, mainly NGOs, social media and environmental institutions try to make the society aware. This article examines the interrelationships between these three concepts. Environmental education provides scientific, social, and ethical knowledge. Through this knowledge, individuals begin to understand how plastic waste harms rivers, streams, ponds, and ultimately the ocean. Vehicle exhaust contributes to air pollution, and deforestation causes floods and soil erosion. Environmental education fosters a sense of the seriousness of environmental problems. This knowledge is the foundation of environmental awareness. Simply having knowledge or information about the environment is not enough; individuals become emotionally aware and self-motivated to work towards environmental conservation. This awareness leads individuals to adopt new methods and practices for environmental protection and addressing these problems, leading to positive results. Thus, it can be said that environmental education is the seed, awareness is the water and fertilizer, and behavioral change is the fruit. Without these three, the tree of sustainable development cannot flourish. To make human life happy and progressive, lasting changes in behavior can be achieved by instilling deep awareness in individuals, which is crucial for building a better society.

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Abstract No. 75

**WETLANDS: SIGNIFICANCE, THREATS AND
THEIR CONSERVATION**

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ABSTRACT

Wetlands are areas where land and water meet, with water present either all year or for part of the year. They include places like swamps, marshes, rice fields, tidal flats, and flooded riverbanks. Wetlands provide many important functions they recycle nutrients, purify water, control floods, recharge groundwater, support wildlife, and supply resources like drinking water, fish, fodder, and fuel. They also help reduce soil erosion, manage urban runoff, and offer recreational benefits. However, due to human activities and urbanization, wetlands are disappearing rapidly. They have features of both land and water ecosystems, and the presence of water for long periods changes the soil, plants, and animals that live there. Since ancient times, wetlands have supported human civilization, agriculture, and economic growth. They strongly influence human health, the environment, and ecosystem balance. Loss of wetlands can lower the water table and disrupt food chains and nutrient cycles, harming both nature and people. Its loss also causes serious environmental and ecological issues that directly affect the social and economic well-being of nearby communities. It can lead to problems such as increased flooding, reduced water quality, and the decline, deformity, or extinction of various species. Wetlands also serve as vital genetic reservoirs for many plants and amphibians' species. Wetlands are now protected by both state and national laws, and in recent years, public awareness and support for their conservation have grown greatly. Raising awareness and promoting education are key to wetland conservation. Protecting these ecosystems through proper actions and policies is essential for maintaining environmental health and human well-being.

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Abstract No. 76

**INNOVATION, INFRASTRUCTURE AND INDUSTRIAL
GROWTH: A CASE STUDY OF POWER LOOM
MODERNIZATION IN MAU CITY**

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ABSTRACT

This study looks at the link between innovation, infrastructure, and industrial growth. It focuses specifically on the modernization of power looms in Mau City, Uttar Pradesh, India. The findings show that modernization efforts, such as using semi-automatic and shuttleless looms, improving energy infrastructure, and increasing access to financial and digital networks, have boosted productivity, product variety, and market competitiveness. However, the study also points out ongoing issues, like unequal access to modern technology for small-scale businesses, inconsistent policy enforcement, and a lack of skill development. The results highlight the important connection between infrastructure and innovation in promoting sustainable industrial growth. To build on these improvements, it's vital to strengthen institutional support, promote public-private partnerships, and expand access to modern technology and training. The study uses only secondary data sources, including government reports, industry surveys, academic publications, and policy documents, to analyze how infrastructure improvements and technological innovations have changed Mau's traditional textile industry. This case study offers useful insights into how we can effectively evaluate industrial modernization efforts in emerging regional economies using secondary data.

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Abstract No. 77

**PULSATILE NANO- DRUG DELIVERY IN STENOTIC
ARTERISE: A COMBINED STUDY OF THERMOPHYSICAL
PROPERTIES AND ENVIRONMENTAL
HEALTH IMPLICATIONS**

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ABSTRACT

The presented work is a comprehensive mathematical and numerical study related to the optimization of pulsatile blood flow and nano-drug delivery in a stenosed artery. Considering the relations between cardiovascular diseases and environmental stressors, in our model, blood was treated as a non-Newtonian fluid conveying ternary hybrid nanoparticles (Au, GO, Fe₃O₄), which can be used for local thermal therapy. Solutions of the momentum, energy, and concentration equations lead to some important results: Stenosis significantly increases WSS and flow resistance. Thermophysically, nanoparticles are able to enhance the thermal conductivity of the blood dramatically, which allows precise control over heating using an external magnetic field. Most importantly, the magnetic field reduces the local blood velocity, prolonging the residence time of the nano-drug at the target site for a sufficient therapeutic effect. Beyond clinical applications, the models have value in the prediction of complex fluid dynamics within environmental systems, such as pollutant dispersion. The investigation of these engineered nanomaterials represents a necessary component of the global discussion focused on environmental fate and responsible stewardship of new medical technologies. The contributions of this work are twofold: first, actionable insight into the optimization of targeted therapies in complex vascular systems, and second, framing the problem within the context of global health and environmental challenges.

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Abstract No. 78

**MAGNETIC FIELD EFFECTS ON HYBRID GPL BLOOD
FLOW IN STENOSED ARTERIES: ENVIRONMENTAL AND
SOCIETAL IMPACT**

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ABSTRACT

Coronary artery disease is one of the main causes of death worldwide, creating an urgent need for better and sustainable medical treatments. This study investigates how a magnetic field and hybrid nanoparticles made of silver and gold can improve blood flow in blocked or narrowed arteries. Using COMSOL Multiphysics software, the effects of different magnetic field strengths and nanoparticle concentrations are analyzed to understand their role in managing artery blockages. Besides medical benefits, this research focuses on environmental and social impacts. Improper handling of nanoparticles may lead to soil and water contamination, affecting aquatic life, plants, and ecosystems. Therefore, adopting eco-friendly methods for nanoparticle production and disposal is essential. Recycling and effective waste management can ensure the safe and sustainable use of nanotechnology. From both environmental and societal perspectives, applying hybrid nanoparticles in healthcare should follow green and responsible practices. Encouraging industries to use clean production methods and safety standards can minimize environmental harm. Moreover, raising public awareness and educating people about the safe use of nanotechnology will help them understand its advantages and possible risks. Government policies promoting the recycling of medical waste and supporting the development of biodegradable nanoparticles can further enhance sustainability. Through these steps, nanomedicine can become both environmentally safe and socially beneficial, leading to a healthier and more sustainable future.

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Abstract No. 79

**HARNESSING NANOTECHNOLOGY: A DUAL APPROACH
TO ENVIRONMENTAL REMEDIATION AND TARGETED
DRUG DELIVERY**

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ABSTRACT

The challenges brought about by environmental degradation and human healths are inextricably linked to each other, since the prevalence of a number of diseases is considered to be strongly related to environmental factors. Against a backdrop of rising levels of pollutants in natural ecosystems and persistently high rates of environmentally linked diseases, new solutions that take both ecological and human health into consideration must be developed. This study adopts a two-fold strategy: It firstly utilize magnetic nanoparticles, designed and deployed through magnetohydrodynamic principles for the selective capture and removal of heavy metal pollutants from contaminated water sources. Secondly, the hybrid technology has been adapted for applications involving targeted drug delivery, with magnetic fields guiding therapeutic agents to disease sites, such as tumors. The synthesis of biocompatible nanoparticles, surface property optimization for pollutant capture/drug binding, and in vitro and in vivo studies to establish efficacy and safety are involved. Its successful execution will bring a revolutionary improvement in environmental health and public health outcomes. Remediation of polluted environments will decrease exposure to harmful substances, whereas allowing targeted drug delivery will enhance the therapeutic efficiency of the drugs while reducing side effects. A holistic approach promises significant advancement in environmental sustainability and human health toward a healthy and resilient future.

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Abstract No. 80

**MODELLING THE ENVIRONMENTAL INFLUENCE ON
MAGNETOHYDRODYNAMIC HYBRID NANOFLUID BLOOD
FLOW USING FRACTIONAL CALCULUS**

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ABSTRACT

Environmental factors such as temperature variations, electromagnetic exposure, and pollution significantly influence blood properties and the behavior of nanoparticles in biological systems. The growing use of metallic nanoparticles like gold and copper in medicine raises environmental concerns due to their potential release into ecosystems, which can alter fluid dynamics in living organisms. Studying magnetohydrodynamic (MHD) hybrid nanofluid blood flow helps understand how magnetic fields-often intensified by industrial and environmental sources-interact with biological fluids and affect human health. This study investigates the influence of pressure gradient on MHD blood flow containing gold and copper hybrid nanoparticles. Caputo's fractional derivative is applied to capture the time-dependent and memory effects of the flow. The governing equations are solved using the Concentrated Matrix Exponential (CME) method, ensuring accurate numerical results even with complex Bessel function terms. Velocity, temperature, and concentration profiles are analyzed to determine how environmental magnetic fields and nanoparticle interactions influence physiological processes such as heat and mass transfer. The findings reveal that fractional-order derivatives enhance velocity, temperature, and skin friction, emphasizing the sensitivity of blood flow to environmental and magnetic variations. Understanding these effects can improve targeted drug delivery, medical diagnostics, and cardiovascular treatments, while promoting sustainable and safe use of nanoparticles in biomedical applications.

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Abstract No. 81

**HYBRID NANO FLUID-ASSISTED BLOOD
FLOW THERAPY IN STENOSIS**

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ABSTRACT

Current heart treatments often place an unseen burden on the environment, consuming vast amounts of energy in hospitals, generating chemical waste from medications, and relying heavily on resource-intensive technologies. This presentation is guided by a simple humanitarian belief: innovations in healthcare should heal patients without harming the planet that sustains us. In this presentation, we explore a smart hybrid nano-fluid composed of microscopic Gold and Copper particles, used to enhance blood flow through stenosed (blocked) arteries under the influence of gentle magnetic forces and controlled heat. The novelty of this technique lies in its precision—the magnetic field allows the nano-fluid to be guided only to the affected area, reducing unnecessary drug exposure to the rest of the body. Patients may receive targeted therapy with increased safety, fewer side effects, and improved recovery time. Additionally, by using a therapy that requires significantly less energy and fewer chemical agents, we help reduce environmental load, contributing to cleaner hospital operations and decreased biomedical waste. Cardiovascular diseases affect millions globally and in low-resource communities, advanced treatments are often unaffordable or inaccessible. A controlled, energy-efficient method like this has the potential to make life-saving care more accessible and to lower the economic burden on families and healthcare systems. Ultimately, the vision is a future in which medicine remains effective and safe while also sustainable—serving humanity without sacrificing the environment.

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Abstract No. 82

**SYNERGY OF ENVIRONMENTAL ETHICS AND HUMAN
RESPONSIBILITY FOR SUSTAINABLE DEVELOPMENT:
A PHILOSOPHICAL AND POLICY PERSPECTIVE WITH
REFERENCE TO INDIA**

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ABSTRACT

The mounting ecological crises of the twenty-first century—climate change, deforestation, pollution, and biodiversity loss—underscore the urgent need to re-evaluate the ethical foundations of humanity's relationship with nature. This paper explores the synergy between environmental ethics and human responsibility as a moral and practical foundation for achieving sustainable development. It argues that sustainability is not solely a scientific or economic issue but a profoundly ethical enterprise that demands a reorientation of values and responsibilities. Drawing from philosophical theories, Indian ethical traditions, and environmental policy frameworks, the paper examines how moral reasoning and human agency can shape equitable, ecologically balanced development. It concludes that India's cultural heritage and constitutional commitments offer a unique ethical basis for harmonizing environmental preservation with developmental goals, thereby contributing to the global pursuit of sustainable development.

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Abstract No. 83

**EFFECT OF PESTICIDES ON FISH BEHAVIOR AND
GILLS OF *HETEROPNEUSTES FOSSILIS***

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ABSTRACT

The distal Part of the gill of *Heteropneustes fossilis* showed swollen gill Lamellae at their base some of the lamellae become branched in proximal area the fusion of neighboring lamellae was noted which was progressive towards the distal portion. The most significant response was degeneration of Gill lamellae. The blood Vessels of branchial region suggested haemostatic changes. The size of nucleus was increased indicating the penetration of cancerous tendency and the occurrence of oedema and gill dropping. The surface increased considerable with loss of co ordination laboured breathing increase mucous secretion and ultimately twisting start swimming with head down position were observed during laboured determination while in the long exposure the histological alternation of gill revealed that specially the pellaster cell shrunken.

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6 & 7 December, 2025

Abstract No. 85

**ADVANCES IN GREEN TECHNOLOGY AND
WASTE MANAGEMENT**

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ABSTRACT

Advances in green technology have become one of the most crucial drivers of sustainable development in the 21st century. Green technologies are innovations that minimize environmental impact, conserve natural resources, and promote cleaner production and energy use. One of the most significant areas of progress is in renewable energy, particularly solar, wind, and hydro power. Modern solar panels now use high-efficiency photovoltaic cells that can convert sunlight into electricity with far less energy loss, while offshore wind farms and floating turbines are expanding the potential of wind energy. Moreover, breakthroughs in energy storage technologies—such as lithium-ion batteries, solid-state batteries, and hydrogen fuel cells—are solving the intermittency problem associated with renewable, allowing energy to be stored and supplied even when sunlight or wind is unavailable. Another major frontier in green technology is green manufacturing and sustainable materials. Industries are increasingly adopting eco-friendly production methods, using biodegradable, recyclable, or renewable raw materials to replace non-renewable and polluting substances. Technologies like 3D printing are reducing material waste by producing customized parts on demand, while bio-based plastics and composites are gradually replacing petroleum-based products. Carbon capture, utilization, and storage (CCUS) is also a growing field, aiming to trap CO₂ emissions from factories and power plants and convert them into useful products such as synthetic fuels, construction materials, or fertilizers. Parallel to these innovations, waste management technologies are evolving to deal with the rising amount of industrial and municipal waste generated by urbanization and consumption. Traditional waste disposal methods such as land filling and incineration are being replaced by integrated waste management systems that focus on the 3Rs—Reduce, Reuse, and Recycle—and even add two more: Recover and Refuse.

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Abstract No. 86

**TOWARDS SUSTAINABLE HEALTH CARE:
ENVIRONMENTAL AND SOCIAL BENEFITS OF
MAGNETIC BLOOD FLOW ANALYSIS**

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ABSTRACT

The study of magnetically influenced blood flow has significant environmental and societal implications. Environmentally, magnetic field-based biomedical technologies offer an eco-friendly alternative to chemical-based treatments, reducing the need for invasive procedures and minimizing the use of harmful contrast agents or toxic substances in diagnostic and therapeutic applications. This approach aligns with sustainable healthcare practices by promoting cleaner and safer medical technologies that generate less biomedical waste. From a societal perspective, understanding how magnetic fields affect blood flow can enhance patient-specific treatments and improve the effectiveness of targeted drug delivery, leading to faster recovery and reduced side effects. Such advancements contribute to a higher quality of life and decreased healthcare costs. Moreover, the insights gained from these studies can support the development of non-invasive diagnostic tools, benefiting patients in remote or resource limited areas. The interdisciplinary nature of this research—linking physics, biology, and healthcare encourages innovation and collaboration, paving the way for sustainable medical solutions that are both socially beneficial and environmentally responsible.

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Abstract No. 88

**EFFECT OF WEED FLORA ON YIELD OF PIGEON PEA AS
INTERCROPPING SYSTEM WITH CEREALS AND MILLETS**

**Alka Kushwaha, Vijay Kumar Singh,
Sunil Kumar and Rachana Singh**

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ABSTRACT

Weeds compete with crops for essential resources such as soil moisture, light, space, and nutrients, thereby reducing crop productivity. Implementing effective weed management practices significantly, improves crop yields particularly when combined with modern production technologies. Since, weeds often emerge alongside crops but possess stronger adaptations and faster growth rates; they gain a competitive edge over cultivated plants. Pigeon pea, though primarily grown as a kharif crop across the country season is both feasible and productive, can also be cultivated during the rabi season in regions with mild and short winters with appropriate varieties and favourable climatic conditions. Weeds incidence tends to be higher in pulses cultivated during the kharif and summer seasons, primarily due to rainfall and irrigation. The level of infestation however, varies depending on crop species, soil type, and management practices. Since pulse crops are generally weak competitors, uncontrolled weed growth can lead to significant yield reductions. Effective weed management therefore, demands a site-specific approach that considers the prevailing weed flora, soil conditions, history of herbicide use, and the broader cropping system to achieve maximum productivity. Pigeon pea (Arhar) may be grown as a sole crop or intercropped with millets and cereals, including Pearl-millet (*Pennisetum glaucum*), Sorghum (*Sorghum bicolor*), Wheat and Barley. In Intercropping with millets and cereals the symbiotic association with rhizobium bacteria contributes to soil fertility by facilitating biological nitrogen fixation. Hence, intercropping pigeon pea with cereals such as bajra, jowar, wheat, and barley effectively enhances weed suppression and improves overall system productivity, offering a robust strategy for sustainable, resilient agriculture in rainfed or resource-constrained environments.

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Abstract No. 89

**BEHAVIORAL OBSERVATION OF INDIAN RHINOCEROS
(*RHINOCEROS UNICORNIS*) IN EX-SITU CAPTIVITY**

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ABSTRACT

The Indian rhinoceros (*Rhinoceros unicornis*), commonly known as the greater one-horned rhinoceros, is an endangered mega herbivore native to the Indian subcontinent, primarily inhabiting the floodplains of Assam and parts of Nepal. Observations were recorded in Kanpur Zoological Park. Severe habitat destruction, fragmentation, and poaching have drastically reduced its wild population, emphasizing the importance of ex-situ conservation programs. These programs, implemented in zoological parks and breeding centers, function as vital genetic reservoirs and provide controlled environments for studying animal behavior, welfare, and management. Key behaviour such as feeding, resting, wallowing, locomotion, and social interactions were systematically observed. The subjects exhibited distinct diurnal activity patterns, with feeding and wallowing predominant during cooler hours, while resting and shade-seeking were observed during midday. Compared to wild counterparts, captive rhinos demonstrated reduced exploratory activity and limited space utilization, of ten due to enclosure constraints. Instances of stereotypic behaviors, including pacing and repetitive head movements, were noted, especially in less enriched enclosures. The introduction of environmental enrichments such as mud wallows, diverse vegetation, and hidden feeding sites significantly enhanced behavioral diversity and reduced abnormal activities. Social interactions remained largely amicable, though minor dominance behaviors were occasionally recorded among males. Research highlights the necessity of proper enclosure design, environmental enrichment, and minimal human interference to foster natural behaviors and improve welfare in captive Indian rhinoceroses. Behavioral assessments such as this are essential for optimizing husbandry protocols, ensuring psychological well-being, and supporting the long-term success of conservation breeding and reintroduction programs.

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Abstract No. 90

**CLIMATE CHANGE AND HUMAN WELL-BEING:
THE MEDIATING ROLE OF ENVIRONMENTAL
AWARENESS AND COMMUNITY ACTION**

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ABSTRACT

Climate change poses unprecedented challenges to human well-being by affecting health, livelihoods, and overall quality of life. However, the extent of its impact is significantly mediated by the levels of environmental awareness and the effectiveness of community-based actions. This paper examines the interconnections between climate change, environmental consciousness, and collective community responses in shaping human resilience and well-being. It highlights how informed and engaged communities can mitigate adverse climate impacts through sustainable practices, resource management, and adaptive behavior. Environmental awareness fosters a deeper understanding of ecological processes and encourages pro-environmental attitudes that translate into practical community initiatives such as afforestation, waste reduction, and climate-resilient agriculture. Simultaneously, community action strengthens social cohesion, enhances adaptive capacity, and empowers local populations to participate actively in climate governance. The synergy between awareness and collective action creates a feedback loop that reinforces both environmental sustainability and social well-being. The study emphasizes the necessity of integrating environmental education, participatory governance, and local capacity-building into climate adaptation strategies. It concludes that enhancing human well-being in the face of climate change depends not only on technological or policy interventions but equally on raising ecological consciousness and mobilizing grassroots-level participation. Strengthening environmental awareness and fostering community action thus emerge as essential mediators for achieving climate resilience and sustainable human development.

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Abstract No. 91

**MICROBIAL QUALITY ASSESSMENT OF
GROUNDWATER IN JAJMAU, KANPUR**

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ABSTRACT

Groundwater is the main drinking source for residents of Jajmau, Kanpur, yet rapid industrial growth and inadequate wastewater management raise concerns about microbial contamination. This study evaluates the microbial quality of groundwater over a one-year period (2024-2025) by using bactaslyde slide BS101 for total bacterial count and Total yeast count. Random collection of water samples were performed in monthly basis and total 48 samples in a year. These samples were collected from Hand pumps/submersible across seasonal and analyzed for indicator Total bacterial count and Total Yeast counts. Results showed that a substantial proportion of samples exceeded for indicating total bacterial count and Total Yeast count with the highest counts observed during the monsoon season. The present study showed, revealed total bacterial count and Total yeast count loads near industrial clusters, suggesting anthropogenic influence. The findings highlight the need for regular monitoring and protective measures to safeguard public health.

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Abstract No. 92

**ERI CULTURE AS A CATALYST FOR WOMEN
EMPOWERMENT AND SOCIAL SUSTAINABILITY**

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ABSTRACT

The Cultivation of Eri-silkworm (*Samia ricini* DONOVAN) for Eri silk manufacturing, or "Eri-culture," is a promising path toward social sustainability and women's empowerment. Eri culture might provide rural women in economically disadvantaged communities with a revolutionary livelihood option. Eri silk manufacturing is distinctively accessible to women entrepreneurs and self-help organizations due to its non-violent harvesting method, cheap capital investment needs, and adaptability to small-scale operations, in contrast to traditional Eri-culture. The study examines several aspects of empowerment made possible by Eri-culture, including greater social standing in communities, increased decision-making power within households, skill development in raising and spinning, and economic independence through income production. Eri cultivation's distributed structure promotes inclusive participation by allowing women to strike a balance between productive employment and household duties. Additionally, by utilizing castor (*Ricinus communis*), papaya (*Carica papaya*), tapioca (*Manihot esculenta*) and other host plants that flourish in the agroclimatic conditions of Uttar Pradesh, Eri culture integrates with agroforestry systems to enhance environmental sustainability. The study looks at current government initiatives, NGO interventions, and cooperative models to well integrate Eri-culture into women-centric development projects throughout rural and semi-urban regions of India. It identifies important elements that affect program performance, such as market connections, community support networks, and training infrastructure. The findings show that Eri culture not only creates sustainable livelihoods but also uplifts women as artisans and entrepreneurs but also reinforces the socio-cultural fabric of sustainable rural development, encourages ecological conservation, and helps achieve Sustainable Development Goals pertaining to responsible production, gender equality, and poverty alleviation.

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Abstract No. 93

**HARISHANKARI: A RELIGIOUS AND SCIENTIFIC WAY OF
PLANTING AND ITS BENEFITS TO ENVIRONMENT**

**Rachana Singh, Irfana Khan, Alka Kushwaha,
Vijay Kumar Singh and Sunil Kumar**

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ABSTRACT

"Harishankari" refers to a combination of three "Sacred tree's" of fig family "Moraceae" ie. Peepal, Pakar, and Banyan are planted together at one location. This is called "Trio" or "Three in One." In Hindu traditions, Harishankari represents the trinity of Lord Brahma, Lord Vishnu and Lord Shiva and planted at the time of Hindu rituals, ceremonies or in the places of worship. The trees are planted in a way that their canopies merge together, that symbolizing unity and harmony and are considered to have spiritual and environmental significance. It provides shelter, shade, food, coolness to animals, humans and the small plants which grows under the shade of these huge trees. The honourable C.M. Uttar Pradesh Mr. Yogi Aaditya Nath started the 'Van Mahotsav' program at Chitrakoot district of Uttar Pradesh with planting to "Harishankari" for the protection of our environment and also for the enhancement of green cover and biodiversity of that particular area where it planted.

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Abstract No. 94

**BIODIVERSITY CONSERVATION AS A TOOL FOR
CLIMATE CHANGE MITIGATION AND ENHANCEMENT
OF HUMAN LIVELIHOODS**

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ABSTRACT

Biodiversity conservation plays a crucial role in mitigating climate change while simultaneously supporting human livelihoods. The interdependence between ecological stability and socio-economic well-being underscores the need for integrated conservation strategies that balance environmental sustainability with human development. This paper explores biodiversity conservation as a multifaceted tool for climate change mitigation through mechanisms such as carbon sequestration, ecosystem restoration, and maintenance of ecological resilience. Diverse ecosystems—forests, wetlands, grasslands, and mangroves—act as significant carbon sinks, regulating greenhouse gas concentrations and buffering the adverse effects of climate variability. Furthermore, biodiversity sustains essential ecosystem services, including soil fertility, pollination, and water regulation, which directly enhance agricultural productivity and rural livelihoods. Conservation-oriented livelihood models such as community forestry, ecotourism, and agroforestry exemplify how biodiversity protection can generate economic opportunities while preserving ecological integrity. The study also emphasizes the importance of traditional ecological knowledge and community participation in designing effective conservation and adaptation frameworks. Despite the growing recognition of biodiversity's climate and livelihood benefits, challenges persist in policy integration, financial mechanisms, and equitable resource distribution. Strengthening institutional frameworks, promoting nature-based solutions, and incentivizing local stewardship are imperative for maximizing co-benefits. The paper concludes that biodiversity conservation should be repositioned not merely as an environmental objective but as a foundational strategy for sustainable climate action and human well-being. By linking ecological preservation with economic resilience, biodiversity-based approaches offer a pathway toward a more adaptive, inclusive, and sustainable future under changing climatic conditions.

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Abstract No. 95

**DIETARY AND HORMONAL MANIPULATIONS IN
ADVANCING MATURATION FOR QUALITY SEED
PRODUCTION OF INDIAN CULTURED FISHES**

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ABSTRACT

With the steadily growing importance of culture fisheries, the fish culturists should improve the technique necessary for securing basic requirement, the production of young ones (fry and fingerlings) for stocking. Hence, the artificial propagation technique needs constant refinement for obtaining quality fish seed at the desired times of the year. Recent advances in fish endocrinology have led to a better understanding of the hormonal factors involved in the control of gamete production, mode of their action and regulation of their secretion during different stages of reproductive cycle. Environmental stimuli like photoperiod and temperature are perceived by the brain which releases gonadotropin-releasing hormone (GnRH) that binds specifically to receptors in the pituitary gonadotrophs and stimulates secretion of gonadotropic hormone (GtH- I, II) which enhance gonadal development and final maturation. GtH-I functions at the target sites in two ways- it induces synthesis and secretion of estradiol-17 β during pre-vitellogenic phase which, in turn, induces vitellogenesis or yolk production during post-vitellogenic phase, GtH-II triggers the synthesis of 17 α ,20 β -dihydroxyprogesterone (17,20-P) responsible for the final gonadal maturation leading to ovulation and spermiation. The recent identification of three GnRH (GnRH 1, GnRH 2 and GnRH 3), kissproteins, two kiss genes (kiss-1, kiss-2) and two kiss receptors (GPR54)- kiss 1r and kiss 2r as well as cytochrome P450 aromatase gene (CYP19) in brain and gonads (ovary and testis) have given better insight into mechanism of hormonal interactions in fish reproduction. Role of pheromones are also gaining importance in advanced phases of reproduction involving the synchronization of maturity, attraction of prospective mates, triggering spawning behaviour and release of gametes.

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Abstract No. 96

MYCOREMEDIATION IN BIOLOGICAL SYSTEMS

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ABSTRACT

Fungi possess unique metabolic versatility, enabling them to degrade, transform, or immobilize a wide variety of environmental pollutants including hydrocarbons, pesticides, dyes, heavy metals, and emerging contaminants. Filamentous fungi and white-rot fungi are particularly effective due to their extracellular ligninolytic enzymes, such as laccases, lignin peroxidases, and manganese peroxidases, which non-specifically oxidize complex and recalcitrant compounds. In biological systems, mycoremediation functions through biosorption, bioaccumulation, biodegradation, and biomineralization processes, thereby reducing pollutant toxicity and restoring ecosystem health. The application of fungal biomass, both living and dead, offers eco-friendly and cost-effective alternatives to conventional remediation technologies, with the added advantage of adaptability to diverse environmental conditions. Additionally, mycorrhizal fungi enhance phytoremediation by improving plant tolerance to heavy metals and organic contaminants, thus creating synergistic plant–fungus remediation systems. Mycoremediation also contributes to circular bioeconomy models by converting toxic substrates into valuable products such as biofertilizers, biofuels, and enzymes. Despite its potential, challenges such as large-scale application, ecological variability, and pollutant-specific efficiency remain areas of ongoing research. Overall, mycoremediation in biological systems represents a natural and sustainable strategy for pollution control, aligning with global goals of environmental conservation, climate resilience, and sustainable development.

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Abstract No. 97

**INTEGRATED APPROACHES TO BIODIVERSITY,
WATER, AND WILDLIFE MANAGEMENT FOR
ECOLOGICAL SUSTAINABILITY**

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ABSTRACT

The management of wildlife, water, and biodiversity are all essential components of ecological sustainability. Ecosystem resilience and productivity are supported by biodiversity, which guarantees the provision of vital services like nutrient cycling, water purification, and climate regulation. As the basis of all life, water supports aquatic and terrestrial species and has a direct impact on species distribution and habitat quality. To preserve ecosystem functions and conserve biodiversity, water resources must be managed effectively through wetland restoration, watershed protection, and sustainable use practices. Similarly, maintaining ecological balance depends on scientific wildlife management techniques that emphasize habitat preservation, population tracking, and conflict resolution. Integrating biodiversity conservation with water and wildlife management has become a top global priority in an era of rapidly changing climate and environmental degradation brought on by humans. This presentation highlights the need for holistic, science-based management frameworks that promote ecosystem resilience, enhance ecological connectivity, and contribute to achieving the United Nations Sustainable Development Goals (SDGs) on life below water, life on land, and climate action.

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Abstract No. 98

**INDOOR AIR QUALITY IN CRITICAL HOSPITAL
MICROENVIRONMENTS: POLLUTANT CHARACTERIZATION
AND HEALTH RISK ASSESSMENT AMONG PATIENTS
AND HEALTHCARE WORKERS**

**Fatima Khursheed^{1,2}, Monika Gupta²,
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ABSTRACT

This study systematically characterized IAQ in eight hospitals located across the eight administrative zones of Lucknow, a rapidly urbanizing metropolitan city in northern India, during the peak monsoon season (5 September 2025 - 15 October 2025). Fine ($PM_{2.5}$) and ultrafine ($PM_{0.1}$) particulate matter were measured using Envirotech APM- 550 and APM-577 M samplers, while formaldehyde (HCHO) and total volatile organic compounds (TVOCs) were quantified using a BR-SMART-126S portable detector. Airborne microbial loads were assessed through passive gravitational sampling using the standard 1/1/1MA scheme across four functional hospital blockier. Operation theatre (OT), general ward, storage room, and hospital laboratory services (HLS). Parallel indoor-outdoor sampling was conducted at each site. $PM_{2.5}$ concentrations ranged from 13 - 48 $\mu g/m^3$, and PM_{10} from 16 - 79 $\mu g/m^3$, with the highest levels recorded in pathology laboratories (Zone1). HCHO concentrations varied between 0.002-1.305 mg/m^3 , peaking in general wards (Zone 3), while TVOCs ranged from 0.003- 5.762 mg/m^3 , with maximum levels in OTs (Zone3). Microbial analysis revealed the highest bacterial load (1690CFU/ m^3) in general wards (Zone6) and the highest fungal load (1179CFU/ m^3) in storage rooms (Zone 5), dominated by *Klebsiella*, *E. coli*, *Bacillus*, *Candida*, and *Aspergillus* species. Indoor pollutant concentrations frequently exceeded WHO and Indian NAAQS reference values, highlighting poor ventilation, inadequate filtration, and persistent indoor emission sources. Although the monitoring period was limited, the findings provide compelling evidence. That many hospital environments are in critical condition and require urgent, high level attention from policymakers and health authorities.

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Abstract No. 99

**FROM ANTHROPOCENTRISM TO ECOCENTRISM:
REIMAGINING LEGAL PERSONHOOD AND
ETHICAL DUTIES TOWARDS NATURE**

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ABSTRACT

For a long time, environmental law has evolved within an anthropocentric lens, where nature's worth is measured by its usefulness to humans. Yet, with accelerating climate change, deforestation, and species loss, it is time for a shift toward ecocentrism — a philosophy that recognizes nature's intrinsic acknowledged the living character of natural entities and emphasized collective duties toward their preservation value and independent right to exist. This article examines how the Indian legal system is gradually embracing this shift. Through decisions such as *T.N. Godavarman v. Union of India* (1997) and *Mohd. Salim v. State of Uttarakhand* (2017), Indian courts have. These developments align with Article 48A and Article 51A(g) of the Constitution, which impose ecological responsibilities on both the State and citizens. Beyond Indian jurisprudence, the paper also engages with global movements — such as Ecuador's recognition of the “Rights of Nature” and New Zealand's Whanganui River model — to explore how legal personhood can serve as a bridge between ethics and enforceable environmental rights. The article argues that recognizing legal personhood of nature is not merely symbolic but foundational for redefining human obligations and establishing accountability mechanisms that go beyond compensation or conservation. Such a shift calls for reimagining law as a living instrument — one that promotes coexistence, ecological justice, and intergenerational responsibility. Ultimately, moving from human-centered governance to planet-centered stewardship is vital to secure ecological balance and long-term human well-being. In doing so, law evolves as a guardian of life's continuity rather than a regulator of its exploitation, aligning jurisprudence with both ethical responsibility and sustainable development goals.

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Abstract No. 100

**ECO-FRIENDLY APPROACHES IN THE SYNTHESIS OF
PHARMACEUTICAL NANOPARTICLES**

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ABSTRACT

The increasing demand for sustainable and biocompatible nanomaterials in the pharmaceutical sector has driven significant interest toward green synthesis strategies. Conventional physical and chemical methods for nanoparticle synthesis often involve toxic solvents, high energy consumption, and hazardous by-products, posing environmental and health concerns. In contrast, eco-friendly approaches utilize biological resources such as plant extracts, microorganisms, polysaccharides, and natural polymers as reducing and stabilizing agents to produce nanoparticles in an environmentally benign manner. This paper explores recent advancements in the green synthesis of pharmaceutical nanoparticles, emphasizing the underlying mechanisms, advantages, and biomedical applications of these sustainable techniques. The discussion highlight show parameters such as pH, temperature, and precursor concentration influence nanoparticle morphology and functionality. Moreover, the potential of green-synthesized nanoparticles in targeted drug delivery, antimicrobial therapy, cancer treatment, and diagnostic imaging is examined. By integrating green chemistry principles with nanotechnology, these innovative synthesis routes offer a promising pathway toward safer, cost-effective, and scalable production of nano-medicines, aligning pharmaceutical innovation with global sustainability goals.

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Abstract No. 101

**PSYCHOLOGICAL DIMENSIONS OF CLIMATE CHANGE:
IMPLICATIONS FOR VULNERABLE POPULATIONS IN INDIA**

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ABSTRACT

The global community is confronting a critical challenge from climate change, which exerts profound effects on human life, biodiversity, and overall well-being. Major concerns include rising global temperatures, accelerated sea-level rise, and increased ultraviolet radiation exposure, and the growing frequency and severity of natural disasters— all of which heighten physical and mental health risks. Beyond its environmental and economic dimensions, climate change also poses serious psychological consequences, particularly for vulnerable populations. As one of the world's fastest-growing economies, India faces significant climate-related challenges that demand urgent and inclusive responses. Addressing the psychological dimensions of climate change requires interdisciplinary collaboration, long-term research, and equitable policies that prioritize the most at-risk groups. A comprehensive and collective approach will help ensure not only ecological resilience but also psychological well-being in the face of a rapidly changing climate.

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Abstract No. 102

CLIMATE CHANGE AND ENVIRONMENTAL ETHICS

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ABSTRACT

Climate change represents one of the most pressing global challenges of the 21st century. This research paper explores the interconnected dimensions of climate change, focusing on mitigation strategies and environmental ethics as essential pillars of sustainable human well-being. Through a multidisciplinary lens, it discusses the scientific, technological, philosophical, and ethical frameworks required to combat climate change and secure a liveable future for all life forms on Earth. Despite growing awareness, climate change mitigation faces numerous obstacles — political inertia, economic constraints, and public apathy. Balancing economic growth with ecological preservation requires systemic transformation. Future research must focus on cross-disciplinary solutions that integrate science, technology, ethics, and policy. Empowering local communities, promoting global solidarity, and fostering moral imagination will be crucial to ensure a just and sustainable future. Climate change is not merely an environmental issue but an ethical, social, and existential challenge. Effective mitigation demands a convergence of technological innovation and moral responsibility. By reorienting human values toward ecological harmony and intergenerational justice, societies can achieve sustainable well-being. The path forward lies in embracing environmental ethics as the guiding compass for all human development.

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Abstract No. 103

**CONTROL OF EGGPLANT (*SOLANUM MELONGENA* LINN.)
SHOOT AND FRUIT BORER *LEUCINOIDES ORBONALIS*
GUENEE (LEPIDOPTERA:PYRALIDAE)**

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ABSTRACT

The Brinjal (*Solanum melongena* Linn.) Occupies an important place in vegetable cultivation due to its high yielding capacity and is widely grown in Uttar Pradesh State. low in calories and high in nutrition, the vegetables have very high-water content and is a very good source of fiber, calcium, phosphorus, and folate. Brinjal fruit contains 92.7% water, 4% carbohydrates, 1.4% protein, 1.3% fiber, 0.3% fats, 0.3% minerals and vitamins A, B, C. White brinjal is said to be good for diabetic patients under Ayurvedic medicines. Unlike staple foods such as cereals and pulses, it is more nutritious having all the essentials of a balanced diet. India, China, Turkey, Japan and Philippines are the major production countries. In India, brinjal is grown on nearly 550,000 hectares, making the country the second largest producer after China with a 26% world production share. It is an important cash crop for more than 1.4 million small, marginal and resource-poor farmers. Brinjal, being a hardy crop that yields well even under drought conditions, is grown in almost all parts of the country. Major brinjal producing states include: West Bengal (30% production share), Orissa (20%), and Gujarat and Bihar (around 10% each). In 2005-2006, the national average productivity of brinjal was recorded around 15.6 tons per hectare. The area under brinjal cultivation is estimated at 0.51million ha. with total production of 8,200,000 Mt. (FAO data, 2005). One of the major constraints for the low productivity is that the crop is more vulnerable to the attack many insect pests. There are many insect pests that attack right from the nursery stage up to seed harvesting stage.

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Abstract No. 104

**INTEGRATING ENVIRONMENTAL EDUCATION FOR
SUSTAINABLE HEALTH DEVELOPMENT**

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ABSTRACT

Environmental education plays a crucial role in promoting health literacy and sustainable lifestyles by fostering awareness of the interdependence between human well-being and ecological balance. The study explores how environmental learning initiatives influence individual and community health behaviors through knowledge, attitude, and action-oriented approaches. It emphasizes the integration of environmental concepts within educational curriculum to encourage responsible practices such as waste management, clean water usage, and pollution reduction. The research highlights that schools and community programs can act as catalysts in cultivating environmentally conscious citizens who understand that a healthy environment ensures better physical, mental, and social health. Findings suggest that enhancing environmental education not only improves environmental protection efforts but also contributes significantly to the achievement of public health goals and sustainable development.

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Abstract No. 105

**SPATIAL VARIATION AND BIODIVERSITY OF
AQUATIC FLORA IN FRESHWATER PONDS
OF BANTWALTALUK, KARNATAKA**

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ABSTRACT

Aquatic flora plays a vital role in maintaining the ecological balance of freshwater ecosystems by contributing to primary productivity, nutrient cycling, and habitat complexity. Hydrophytes are used as food sources some of them are have medicinal importance and most importantly these play a vital role in healthy ecosystems. The present study was undertaken to assess the spatial variation and biodiversity of aquatic macrophytes and microphytes in selected freshwater ponds of Bantwaltaluk, Dakshina Kannada district, Karnataka. The macrophytes were collected by hand pricking from the littoral one and exposed marginal areas of the tank near to sampling station and then brought to laboratory immediately. The collected specimen were identified and confirmed with regional floras. Phytoplankton groups recorded in certain water bodies of Bantwaltaluk comprises six major groups viz., Chlorophyceae, Bacillariophyceae, Cyanophyceae, Euglenophyceae and Xanthophyceae. Among five groups Chlorophyceae members dominated followed by Cyanophyceae and Bacillariophyceae respectively. A total of 11 genera and 15 species of Bacillariophyceae were recorded and a total of 18 genera and 30 species of Cyanophyceae were recorded. There are about 70 species of hydrophytes recorded from 52 genera's. The aquatic plants diversity represented by different growth form majority of them is rooted anchored plants. The plant species like *Ipomea aquatica*, *Chara*, *Colocasia esculenta*, *Pistia*, *Echornia*, *Hydrilla verticillata* are found in large number in most of all ponds by suppressing the growth of regional biota. The findings highlight the importance of conserving small freshwater bodies as reservoirs of aquatic biodiversity and as indicators of ecological health. Continuous monitoring and sustainable management practices are recommended to preserve these vital ecosystems in the rapidly developing landscapes of coastal Karnataka.

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Abstract No. 106

**INDIAN VISCUM SPECIES AS A CROSSROAD FOR
ECOLOGICAL AND HEALTH SECURITY**

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ABSTRACT

Mistletoe, *Viscum species*, is a group of hemiparasitic plants with established ecological, economic and cultural significances. Mistletoes are considered as keystone species of the forest ecosystems. It contributes to forest ecosystems by interacting with multiple host trees, influencing forest diversity and serving as a resource for various birds and insects. Globally, mistletoe (*Viscum*) preparations are also known for its anticancer action and are commercially available in market, especially in Europe. India represents more than ten per cent of global *Viscum* diversity. Indian Mistletoes are widely distributed across India and well known for its use in traditional medicinal system. In Indian traditional medicine, mistletoe species have been used for centuries to treat ulcers, tumor, hypertension, blood related diseases, inflammatory diseases, snake bites, reproductive problems etc. The present study focused on exploring the *Viscum* diversity in Western Ghats region of India and its potential as therapeutic anticancer agent. Plant samples were collected from Western Ghats region of India. Plant extract was prepared and the bioactive ingredient of the extract was purified. Both, plant extract and its bioactive ingredient were tested for its anticancer activity against blood cancer (leukemia) cell lines. The plant extract and its bioactive compound showed immense anticancer potential against leukemia cell lines. The study is one of the very first researches on bioactive compounds of Indian mistletoe with anticancer therapeutic prospects. The study presented mistletoe as a tool in bridging the gap between ethnomedicine and modern pharmacology. Thus, sustainable management Indian mistletoe has dual significance with balancing ecological and medicinal values to optimize conservation and healthcare benefits.

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Abstract No. 107

**ENVIRONMENTAL IMPACT OF CLIMATE CHANGE ON
THE REPRODUCTIVE FECUNDITY OF FRESHWATER FISH
CHANNA SPECIES IN RIVER KUANO, UTTAR PRADESH,
INDIA: IMPLICATIONS FOR ECOSYSTEM SUSTAINABILITY
AND RURAL WELL-BEING**

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ABSTRACT

Climate change poses significant threats to freshwater ecosystems, altering environmental conditions that regulate aquatic biodiversity and fish reproductive processes. The present study investigates the environmental impact of climate variability on the reproductive fecundity of freshwater fish *Channa* species inhabiting the River Kuano in Uttar Pradesh, India. As a vital component of the rural economy, these fish serve as both a nutritional resource and livelihood base for local communities. Seasonal field sampling and laboratory analyses will be conducted to evaluate physico-chemical parameters (temperature, pH, dissolved oxygen, hardness, nutrients, etc.) and biological indices such as Gonadosomatic Index (GSI), fecundity, and ova diameter. Statistical models will be used to establish correlations between environmental factors and reproductive traits, identifying how changing climatic patterns—especially temperature fluctuations and altered rainfall—affect gonadal development and spawning success. The findings are expected to provide quantitative evidence of climate-induced stress on fish reproduction and ecosystem productivity. The study will further discuss implications for sustainable fisheries management, biodiversity conservation, and rural well-being under a changing climate. By linking ecological responses to socio-economic outcomes, this research supports climate adaptation and mitigation strategies that ensure the resilience of freshwater ecosystems and the communities dependent on them.

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Abstract No. 108

**TOXIC IMPACT OF CLOTHIANIDIN ON GLYCOGEN
CONTENT IN THE KIDNEY TISSUE OF FRESHWATER
FISH *PUNTIOUS SOPHORE***

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ABSTRACT

The freshwater fish *Puntius sophore* was selected as an experimental model to evaluate the biochemical toxicity of the neonicotinoid insecticide Clothianidin, a widely used systemic agent in modern agriculture. *Puntius sophore*, being a small cyprinid fish commonly found in Indian freshwater bodies and widely consumed by humans, serves as a reliable bioindicator for assessing aquatic contamination and potential human health risks. The present study was designed to determine the acute toxic effects of Clothianidin on the glycogen content in kidney tissue, a crucial metabolic indicator of energy balance and organ health. The fish were exposed to graded, sub-lethal concentrations of Clothianidin corresponding to different exposure durations 24, 48, 72, and 96 hours with test concentrations equivalent to 5.15 mg, 4.2 mg, 3.1 mg, and 1.6 mg, respectively. These doses were selected based on the acute toxicity (LC₅₀) values of related neonicotinoids such as Clothianidin to ensure comparable physiological stress conditions. The findings revealed a progressive decline in glycogen content in the kidney tissues with increasing exposure time and concentration of Clothianidin. This depletion indicates a shift in the fish's metabolic processes, wherein glycogen stores are mobilised to meet the heightened energy demands imposed by toxic stress. Such glycogen degradation is likely linked to enhanced glycolytic activity and increased utilisation of carbohydrate reserves for detoxification and survival mechanisms. Histopathological observations of the kidney tissue further supported these biochemical changes, showing mild to severe cellular degeneration, tubular damage, and vacuolation in the renal epithelium at higher concentrations. The reduction in glycogen, therefore, not only reflects impaired carbohydrate metabolism but also points to the onset of metabolic distress and renal dysfunction in *Puntius sophore*.

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Abstract No. 109

**BIOMASS CONSERVATION: A PATHWAY TO ENERGY
SECURITY AND ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Biomass conservation represents a critical strategy for sustainable resource management in an era of increasing energy demands and environmental concerns. It is a key pillar of sustainable development, emphasizing the efficient and responsible use of biological resources to reduce environmental degradation. This study examines the multifaceted approaches to conserving biomass resources, including agricultural residues, forest materials, and organic waste streams, while maintaining ecological balance and supporting renewable energy initiatives. By promoting the conversion of organic waste into renewable energy and value-added products, it minimizes reliance on fossil fuels and curbs greenhouse gas emissions. The findings demonstrate that implementing comprehensive biomass conservation frameworks can achieve up to 30-40% reduction in resource waste while simultaneously supporting carbon sequestration goals and promoting circular economy principles. Sustainable biomass management not only preserves ecosystem balance and soil fertility but also supports the transition toward a circular, low-carbon economy. This review highlights recent advances, challenges, and future directions in biomass conservation as a pathway toward global energy security and environmental resilience.

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Abstract No. 110

**CLIMATE CHANGE MITIGATION AND ENVIRONMENTAL
CHANGE USING REGRESSION ANALYSIS**

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ABSTRACT

Climate change has emerged as the most pressing global challenge of the 21st century, leading to rising temperatures, altered weather patterns, biodiversity loss, and increased frequency of extreme climatic events. Understanding the quantitative relationship between anthropogenic activities and global temperature changes is essential for designing effective mitigation strategies. This study proposes a regression-based framework to evaluate the impact of key environmental drivers—carbon dioxide emissions (CO₂), CO₂ per capita, and energy consumption—on global temperature anomalies. Using global datasets from 2010–2023, a multiple linear regression model, polynomial regression, and autoregressive time-series regression were applied to quantify environmental change. Results show that CO₂ emissions exhibit the strongest positive correlation with temperature anomaly ($p < 0.05$), followed by energy consumption per capita. The polynomial regression model reveals a non-linear accelerating warming trend, confirming that incremental CO₂ concentration leads to disproportionately larger temperature increases. Time-series modelling (ARX) shows high inertia in temperature change, with a lag coefficient of 0.82. Findings provide a scientifically supported basis for policy interventions aimed at reducing emissions, increasing renewable energy adoption, and monitoring environmental indicators. This work contributes to data-driven climate mitigation strategies by presenting a robust mathematical and statistical modelling framework.

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Abstract No. 111

**AN INTERFACE OF MASS MEDIA IN SUSTAINABLE
DEVELOPMENT: A CASE STUDY OF SDGS**

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ABSTRACT

The Sustainable Development Goals (SDGs) represent a global commitment to addressing urgent challenges such as poverty, inequality, climate change, environmental degradation, and the need for peaceful and inclusive societies. Designed as a universal roadmap for progress, the SDGs require a coordinated action from governments, institutions, and communities. Their success relies not only on policymaking but also on widespread public understanding and participation. Without broad awareness, the goals risk remaining distant international declarations rather than becoming meaningful, actionable priorities within people's everyday lives. In this context, mass media functions as a crucial bridge that connects global development agendas with public consciousness. Through news reporting, digital storytelling, social media campaigns, documentaries, discussions, and community-based communication, media translates complex SDG themes into accessible information. By highlighting real-world examples, showcasing grassroots initiatives, and framing sustainability issues in relatable terms, media helps individuals see how global goals intersect with local realities. Media's agenda-setting and framing power allow it to determine which SDG issues gain visibility and how urgently they are perceived. The interaction between media communication and public awareness shapes society's overall engagement with sustainable development. Clear and consistent messaging encourages people to recognize their own role in issues such as responsible consumption, environmental protection, gender equality, and community well-being. When media uses inclusive language, culturally relevant narratives, and locally grounded stories, the SDGs become more understandable and approachable. Public motivation to participate in sustainable practices grows as people see examples from within their own communities.

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Abstract No. 112

**FOOD SAFETY ENHANCEMENT THROUGH
NATURAL BIOPESTICIDES IN POST - HARVEST
SORGHUM GRAIN PROTECTION**

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ABSTRACT

Food safety issues are one of the major challenges for us today. Millets play a vital role in sustainable agriculture due to their high nutritional value, adaptability to harsh climates, and resilience to drought. To ensure food security, it is essential to maintain the safety and quality of millets. Among various millets, Sorghum is one of the most important, as it is rich in carbohydrates, proteins, vitamins, and minerals. Sorghum serves as the main food crop in dry regions, and Uttar Pradesh is one of the leading producers of this millet in India. However, the major challenge lies in the post-harvest storage of Sorghum grains, which are often attacked by several insect pests. Infestation by these pests leads to reduced grain weight, poor germination, contamination, and deterioration of nutritional value, ultimately affecting both market and household-level food quality. To overcome these problems, many farmers are now using botanical pesticides such as Neem (*Azadirachta indica*), Sweet flag (*Acorus calamus*), Custard apple (*Annona squamosa*), Shatavari (*Asparagus racemosus*), and Harshingar (*Nyctanthes arbor-tristis*) instead of chemical pesticides. These botanical pesticides are considered the best natural alternative to synthetic chemicals because they are biodegradable, cost-effective, and eco-friendly, providing safe protection to stored grains. Thus, these natural pesticides are a sustainable and farmer-friendly solution for protecting stored Sorghum grains from pest damage. The use of these natural pesticides thus plays a vital role in sustainable Sorghum production and protection, ultimately contributing to human health and food safety.

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Abstract No. 113

ENVIRONMENTAL ETHICS AND HUMAN RESPONSIBILITIES

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ABSTRACT

In an age defined by technological progress and ecological decline, environmental ethics has become the moral compass guiding humanity's relationship with nature. This paper examines the philosophical and practical dimensions of human responsibility toward the environment, emphasizing that ethical awareness is not merely an intellectual pursuit but a collective necessity for survival. Environmental ethics encourages a transition from anthropocentric to ecocentric thinking, where all living and non-living components of the ecosystem are valued for their intrinsic worth. Human responsibility extends beyond conservation to include stewardship, innovation, and sustainable coexistence. This study proposes an integrated ethical framework that blends traditional ecological wisdom, modern environmental science, and sustainable practices. Through this synthesis, environmental responsibility can evolve from moral rhetoric into daily action. Ultimately, restoring harmony between humanity and nature is not an aspiration for the future—it is an ethical imperative of the present.

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Abstract No. 114

**GREEN NANOTECHNOLOGY-BASED NANOFLUIDS FOR
SUSTAINABLE ENHANCED OIL RECOVERY**

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ABSTRACT

With the increasing demand for cleaner, greener energy, the interest in ecologically friendly methods of Enhanced Oil Recovery has grown. Nanotechnology, being a green alternative to conventional chemical and thermal EOR methods that are often energy-intensive and ecologically hazardous, is at the core of this work. In an effort to develop environmentally acceptable nanofluids for sustainable Enhanced Oil Recovery, zinc oxide, titanium dioxide, and silica nanoparticles are dispersed in xanthan gum polymer solutions. The prepared nanofluids exhibit lower toxicity, higher interfacial activity, and superior stability compared to conventional surfactants. According to experimental results, the optimized nanoparticle concentrations have significantly reduced interfacial tension, enhanced viscosity, and improved wettability toward water-wet conditions, all of which enhance the mobilization of crude oil. These benefits ensure that higher sweep efficiency can be achieved with fewer amounts of chemical dosages and lower operating energy use. Low concentrations of metal oxide nanoparticles reduce the generation of waste and their detrimental impacts on the environment. In summary, nanofluids prepared with nanoparticles are a feasible route for green technology that encourages efficient resource utilization, a minimal environmental impact, and compliance with international sustainability goals.

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Abstract No. 115

**BIOREFINERIES ON SIX LEGS: INSECTS AS
CENTRAL AGENTS IN WASTE VALORIZATION AND
THE CIRCULAR BIOECONOMY**

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ABSTRACT

The transition to a Circular Bioeconomy necessitates innovative, low-carbon solutions for managing mounting organic waste streams and securing sustainable resources. This study explores the transformative potential of entomology-based bioconversion, focusing on the strategic utilization of insect species—primarily the Black Soldier Fly (*Hermetia illucens*) and mealworms—as efficient, decentralized "biorefineries on six legs". Insects possess a unique biological capacity to rapidly process heterogeneous organic waste (e.g., agricultural by-products, food waste, manure) into valuable biomaterials, thereby achieving comprehensive waste valorization. This process effectively closes nutrient loops, aligning with core green technology principles. The larvae convert low-value input into three primary high-value outputs: (a) Sustainable Protein and Lipid Fractions: High-quality animal feed and potential food ingredients, reducing reliance on unsustainable feedstocks like fishmeal and soy, (b) Chitin and Chitosan: Advanced functional biopolymers with applications in biomedicine, water treatment, and food packaging and (c) Insect Frass: A nutrient-rich soil amendment that serves as a biofertilizer, enhancing soil health and productivity. Furthermore, this bioconversion process offers significant environmental benefits, including substantial reduction in waste volume, mitigation of greenhouse gas emissions associated with landfilling, and decreased consumption of land and water resources compared to conventional protein production. This paper discusses the critical advances in optimizing insect rearing systems, standardizing bioprocessing technologies, and navigating regulatory pathways essential for scaling up this entomology-driven green technology. Ultimately, leveraging insects as central agents in waste valorization provides a scalable, sustainable, and economically viable pathway toward achieving a truly resource-efficient Circular Bioeconomy.

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Abstract No. 116

**ECOFEMINISM AS A PATHWAY TO SOCIAL AND
ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Ecofeminism offers a critical framework for understanding the interconnected oppression of women and the degradation of the natural environment. This research explores how ecofeminist philosophy provides a powerful pathway to achieving both social and environmental sustainability. By highlighting the parallel domination of women and nature under patriarchal and exploitative economic systems, ecofeminism argues that genuine sustainability cannot be attained without addressing gender inequality and ecological injustice. The study examines major ecofeminist thinkers—such as Vandana Shiva, Maria Mies, and Carolyn Merchant—to show how women's traditional knowledge, community-centered practices, and ecological stewardship contribute to sustainable living models. Further, the paper analyses how ecofeminist principles align with social sustainability goals, including equity, participation, community well-being, and inclusive development. It also evaluates ecofeminism's relevance to environmental sustainability, particularly in promoting biodiversity conservation, climate resilience, and ethical resource use. Case examples from India—such as the Chipko Movement and women-led environmental activism—demonstrate how women's leadership fosters ecological protection and social empowerment simultaneously. The study concludes that ecofeminism does not merely critique existing development patterns but offers a holistic vision of sustainability grounded in justice, care, cooperation, and ecological balance. Integrating ecofeminist insights into policymaking, environmental governance, and community development can significantly strengthen efforts toward a socially just and environmentally sustainable future.

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Abstract No. 117

**DIGITAL NATIVES, GREEN CITIZENS: HOW SOCIAL MEDIA
CAMPAIGNS SHAPE ENVIRONMENTAL CONSCIOUSNESS
AND PRO-ENVIRONMENTAL BEHAVIOR AMONG YOUTH**

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ABSTRACT

This paper examines the transformative role of social media campaigns in shaping environmental consciousness and pro-environmental behaviour among youth populations. As digital natives get more involved in climate activism via platforms such as Instagram, TikTok, and Twitter, understanding the mechanisms by which online environmental communication influences real-world behaviour becomes crucial. Through synthesis of existing literature, case studies of prominent campaigns, and theoretical frameworks including the Theory of Planned Behavior and Social Cognitive Theory, this research reveals that social media campaigns effectively raise awareness, foster collective identity, and facilitate behavioral change when they incorporate authentic storytelling, peer influence, and actionable steps. However, challenges such as performative activism, information overload, and the intention-behavior gap persist. The findings suggest that while social media represents a powerful tool for environmental mobilization, its effectiveness depends on strategic design that bridges digital engagement with tangible environmental action.

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Abstract No. 118

**IN SILICO MOLECULAR DOCKING ANALYSIS OF PAES AND
PAHS WITH BREAST CANCER TARGETS HER2 AND BRCA1**

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ABSTRACT

Endocrine-disrupting chemicals (EDCs), particularly phthalate esters (PAEs) and polycyclic aromatic hydrocarbons (PAHs), are increasingly associated with carcinogenesis due to their ability to interact with oncogenic and tumor-suppressor pathways. This study presents an in silico molecular docking assessment of selected PAEs dimethyl phthalate (DMP), diethyl phthalate (DEP), and butyl benzyl phthalate (BBzP) and PAHs benzo(a)pyrene [B(a)P] and pyrene (Pyr) toward key breast cancer related protein targets: HER2 (ERBB2) and BRCA1. Two HER2 structures were examined to explore binding across distinct functional regions: the extracellular domain (PDB ID: 3PP0) and the intracellular kinase domain (PDB ID: 3RCD). Additionally, docking against the BRCT domain of BRCA1 (PDB ID: 1JNX) enabled evaluation of interactions with DNA repair associated sites. Among the tested compounds, BBzP displayed the strongest affinity for the HER2 extracellular domain (116.17), while DMP, DEP, and Pyr exhibited comparable binding profiles for both HER2 and BRCA1. Notably, B(a)P demonstrated the highest affinity for the HER2 kinase domain, suggesting a potential mechanism by which PAHs may influence HER2 driven signaling pathways. Key stabilizing interactions included van der Waals forces, hydrogen bonding, carbon hydrogen interactions, and π -alkyl contacts. Pharmacokinetic and physicochemical characteristics of the compounds were evaluated using SWISSADME, providing insights into bioavailability and exposure-related risks. Protein stereochemical quality was validated via Ramachandran plot analysis. Overall, the docking results indicate that environmentally relevant EDCs can form stable complexes with HER2 and BRCA1, supporting a potential mechanistic link between chronic exposure to PAEs/PAHs and breast cancer initiation or progression.

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Abstract No. 119

**STUDY OF ENVIRONMENTAL ETHICS IN THE AGE OF
TECHNOLOGY: CHALLENGES AND RESPONSIBILITIES**

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ABSTRACT

Artificial intelligence, robotics and renewable energy systems have experienced unprecedented technological development in the 21st century. Although the advancements have increased the standards of living of the human beings, it has also increased the rate of environmental degradation, reduction of resources and climatic extremities. The nexus between the environmental ethics and technology brings complicated moral issues, which require the redefinition of the human responsibility. This paper is a critical analysis of the ethics of technological innovation in terms of its environmental impact, ethical responsibility, and ways to address it. Through a qualitative and conceptual framework, it investigates how ethical reasoning, sustainability principles, and ecological consciousness can guide responsible technological development. The study ends by stating that sustainable progress will never be achieved without the incorporation of environmental ethics into the design and governance of technology as well as the education.

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Theme: CLIMATE CHANGE: MITIGATION AND
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6 & 7 December, 2025

Abstract No. 120

**ETHNO-MEDICINAL STUDIES OF VASCULAR
PLANTS IN VICINITY OF SANDI BIRD SANCTUARY,
HARDOI, UTTAR PRADESH**

**Vineet Kumar Singh, Shubham Kumar,
Atul Kumar Anand and Alka Kumari**

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ABSTRACT

In Indian culture, traditional remedies play a significant role. The results of a two-year investigation on ethnomedicinal applications of plants in Sandi Bird Sanctuary (SBS) and the surrounding areas are illustrated in present study. Information about several plants that the local population uses to treat a variety of common illnesses has been observed. Data on the use of medicinal plants were gathered through in-depth observations and discussions with local indigenous people as well as interviews through questionnaire. Around 50 participants of different age groups were selected for each plant. The present study reported the use of around 40 plants from 23 families by different tribals as well as the indigenous healers. The plant species *Dalbergia sissoo*, *Cassia fistula*, *Butea monosperma*, and *Albizia lebbek* had the maximum utility. Hepatitis, jaundice, diabetes, respiratory conditions, and skin problems were the most often reported ailments. The most commonly used plant parts are roots (17%), followed by leaves (16%) and bark (15%). This study provides insights of advanced research initiatives in field of pharmacognosy and in viewpoints to search some novel medicinal plants.

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Abstract No. 121

**ALTERED COMPETITION OUTCOMES AMONG INSECT
SPECIES UNDER EXPERIMENTAL WARMING CONDITIONS**

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ABSTRACT

Experimental warming studies reveal that temperature-mediated alterations in competitive interactions among insect species represent a critical mechanism through which climate change restructures arthropod communities. Field experiments with artificial heating demonstrate that herbivore biomass increases disproportionately compared to plant biomass, while parasitoid biomass remains unchanged at elevated temperatures, resulting in communities increasingly dominated by herbivores. Temperature elevation of 5°C above ambient conditions in a corn-aphid-predator-ant system paradoxically reduced aphid abundance despite accelerated population growth rates, attributed to decreased ant abundance and reduced aggressive defense of aphids against predators at higher temperatures. Laboratory experiments reveal that fecundity declines with adult density through intraspecific competition, with the strength of competitive interactions being temperature-dependent and most pronounced at temperatures optimal for reproduction. Multi-species transplant experiments into sites 2.5°C warmer than native ranges documented marked shifts in guild structure, characterized by reduced sapsucker populations and increased predator and scavenger abundance, suggesting differential thermal advantages across functional groups. Temperature-induced body size alterations reflect changes in ecological interactions including competition and predation, with significant implications for population abundance and overall community composition. Under resource-limiting conditions enhanced by temperature extremes, insects capable of surviving with lower resource consumption gain competitive advantages, while species exhibiting higher phenotypic plasticity through body size reduction can reduce resource demands in warm environments. These experimental findings underscore that competitive hierarchies among insect species are not static under climate warming but rather exhibit complex, temperature-dependent reorganization with profound implications for community assembly, ecosystem functioning, and pest management strategies in agricultural and natural systems.

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Abstract No. 122

**IMPACT OF DEMOGRAPHY ON THE DIVERSITY OF
GUANOPHILIC FUNGI OF FULVOUS FRUIT BAT,
*ROUSETTUS LESCHENAULTII***

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ABSTRACT

Bats are ecologically significant reservoirs of various fungal communities, some of which possess pathogenic potential. This study investigated the impact of demography and roost site-specific fungal association with fulvous fruit bat, *Rousettus leschenaultii* at two roost sites in Uttar Pradesh. The guano samples were subjected to fungal culture and characterized using scanning electron microscopy (SEM). The analysis of guano samples revealed notable site-specific differences in fungal communities. Fungal species such as *Aspergillus fumigatus* and *A. niger* were common to both sites. High fungal diversity ($n=7$) was observed at King Palace with unique occurrence of species such as *Fusarium oxysporum*, *Umbelopsis ramanniana*, and *Arthroderma insingulare*. In contrast, A fim Kothihosteda fewer fungal diversity ($n=5$), including potentially pathogenic species such as *Apophysomyces elegans* and *Cladosporium cladosporioides*, likely influenced by anthropogenic factors. These findings highlight how the structure of bat colonies and the surrounding microclimate together influence the fungal diversity present in their roosts. The presence of opportunistic and pathogenic fungi underscores the need for regular fungal monitoring in bat habitats. The high fungal diversity at bat roost sites suggest the suitability of stable environment for favorable fungal growth. This study enhances our understanding of fungal communities in bat associated environments and possible risks to human.

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Abstract No. 123

**CARDIOVASCULAR CHALLENGES IN A CHANGING
ENVIRONMENT: MODELING OVERLAPPING STENOTIC FLOW**

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ABSTRACT

Environmental conditions are quietly reshaping human health, with rising pollution levels, temperature fluctuations, and lifestyle shifts placing added strain on the cardiovascular system. These factors can thicken blood, intensify inflammatory responses, and hasten arterial narrowing, creating an urgent need to understand how such external pressures interact with existing vascular obstructions. Motivated by these concerns, this study investigates blood flow through an overlapping arterial stenosis, where multiple constricted segments coincide and significantly disrupt normal hemodynamics. The stenosed arterial region is modeled as a cylindrical tube with overlapping constrictions, and analytical as well as numerical methods are used to capture essential flow features. Only the key characteristics, such as velocity distribution, pressure gradients, and wall shear stress, are examined to keep the focus sharp and relevant. The results reveal how geometric complexity influences flow resistance, amplifies shear forces, and may accelerate disease progression. By clarifying the connection between environmental stressors, stenosis geometry, and altered blood flow, this work supports improved diagnostic methods, better biomedical device design, and more effective treatment strategies. Ultimately, the study contributes to societal well-being by strengthening our understanding of cardiovascular risks in an era where environmental factors increasingly shape human physiology.

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Abstract No. 124

**ENVIRONMENTAL ETHICS IN GENERIC PHARMA: THE
CRITICAL ROLE OF ENVIRONMENTAL RISK ASSESSMENT
AVOIDING REJECTION AND DELAYS IN GENERIC DOSSIER**

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Banasthali Vidyapith, Jaipur (Rajasthan), India

ABSTRACT

The ethical obligation to minimize environmental harm during drug development and manufacturing becomes paramount. For approval of a generic drug in most of the regulated market, Environmental Risk Assessment (ERA) is one of the requirements. Absence of ERA or justification for its exclusion can lead to rejection of the application or delay the approval, which ultimately delay patient's access to affordable medicines. Generic drug dossier's assessments are no more merely technical. They reflect a broader ethical commitment to sustainable pharmaceutical practices that protect ecosystems and, by extension, human well-being. The U.S. Food and Drug Administration (FDA) under the National Environmental Policy Act (NEPA) and FDA regulations in 21 CFR Part 25, requires inclusion of ERA or its categorical exclusion. Absence of an ERA leads to "Refuse to Receive", which means the dossier will not be accepted for review. European regulatory body EMA (EMA/CHMP/SWP/4447/00 Rev. 1) mandates that all marketing authorisation applications to perform ERA. ERA must be submitted in appropriate dossier module as per country specific requirements. Similarly, Health Canada as per Canadian Environmental Protection Act, 1999 assesses ERA. Environmental Risk Assessment (ERA) isn't just about meeting regulatory requirements; it's a responsibility we share to make sure medicines are safe for both people and the planet.

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Abstract No. 125

**ENVIRONMENT, HEALTH, AND PRECISION THERAPY:
FRACTIONAL-ORDER MODELLING OF
MAGNETIC DRUG DELIVERY**

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ABSTRACT

Modern environmental pressures such as rising pollution, chemical exposure, and climate-driven health vulnerabilities are intensifying the global burden of cancer and cardiovascular diseases. These conditions not only weaken human immunity but also demand treatment strategies that are safer, more precise, and less taxing on the body and healthcare systems. Motivated by these environmental and societal challenges, this study focuses on magnetic drug targeting as a modern nanotechnology-based approach capable of delivering medication directly to diseased tissues while minimizing side effects and reducing medical waste. In this work, drug-carrying nanoparticles are modeled as they move through a permeable blood vessel containing Jeffrey fluid, with memory effects represented through the Caputo fractional time derivative. The governing equations are non-dimensionalized, the velocity field is obtained analytically using Laplace and Hankel transforms, and a fourth-order Runge-Kutta algorithm is employed to compute particle trajectories. The results show that short memory effects support faster movement toward the target, relaxation slows the carriers, whereas retardation enhances progression. Stronger magnetization and higher nanoparticle concentration increase capture efficiency, while porous resistance decelerates motion. By clarifying how these physical factors shape targeted drug transport, the study contributes to societal well-being by promoting precise, low-impact, and environmentally adaptive drug-delivery technologies that reduce treatment intensity, limit systemic toxicity, and support healthier communities.

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Abstract No. 126

**CHARACTERIZATION OF GENETIC DIVERGENCE AMONG
GLADIOLUS VARIETIES FOR BREEDING APPLICATIONS**

Shenu Sankhwar and Archana Srivastava

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ABSTRACT

An investigation was conducted to assess genetic divergence among 30 gladiolus (*Gladiolus* spp.) varieties using Mahalanobis D^2 statistics and multivariate analysis techniques. Fifteen quantitative and qualitative characters including plant height, spike length, floret diameter, number of florets per spike, days to spike emergence, days to first floret opening, corm weight, and corm yield were evaluated. The genotypes were grouped into five distinct clusters, with Cluster I contain the maximum number of varieties (12), followed by Cluster II (8), Cluster III (5), Cluster IV (3), and Cluster V (2). Principal component analysis revealed that the first four components accounted for 78.6% of the total variation, with spike length (22.3%), floret diameter (18.4%), and days to flowering (15.7%) contributing maximum divergence. The maximum inter-cluster distance was observed between Cluster II and Cluster V ($D^2 = 487.32$), followed by Cluster I and Cluster IV ($D^2 = 412.68$), indicating substantial genetic diversity. Intra-cluster distances ranged from 18.45 to 56.78, considerably lower than inter-cluster values. Cluster II exhibited superiority for spike length (92.4 cm) and number of florets (18.6), while Cluster V showed maximum floret diameter (11.8 cm) and corm yield (285.4 g/plant). The analysis identified varieties 'White Prosperity' (Cluster V) and 'American Beauty' (Cluster II) as most divergent genotypes. Crosses between genetically distant clusters, particularly II $\times$ V and I $\times$ IV combinations, are recommended for hybridization programs to exploit maximum heterosis and generate superior transgressive segregants with enhanced flower quality and yield attributes.

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Abstract No. 127

**FACTORS INFLUENCING THE SUCCESS OF
WOMEN- LED STARTUP IN INDIA**

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ABSTRACT

The startup ecosystem in India has evolved exponentially over the past decade, positioning itself among the top startup hubs globally. As this entrepreneurial wave gained momentum, a significant development has been the emergence of women-led startups. From technology and e-commerce to social entrepreneurship and health-tech, Indian women entrepreneurs are gradually reshaping traditional business dynamics. However, despite the increasing participation of women in entrepreneurship, they continue to face a multitude of challenges that affect the scalability, sustainability, and success of their ventures. Traditionally, Indian society has been deeply patriarchal, where women's roles were confined to domestic spheres. While urbanization, globalization, and educational reforms have contributed to changing this scenario, women's participation in the economic landscape— particularly in leadership and entrepreneurship—remains limited. According to a 2023 report by NASSCOM, only about 18% of all Indian startups are led by women. These women-led ventures often face gender-based discrimination, limited access to capital, underrepresentation in high-growth sectors, and societal skepticism. Moreover, factors such as access to education, skill development, family support, mentorship, financial inclusion, government policies, and institutional backing greatly influence a woman entrepreneur's journey. The absence or presence of these factors can determine whether a startup merely survives or truly succeeds. In recent years, the Government of India has recognized the need to promote inclusive entrepreneurship, resulting in the launch of initiatives like Stand-Up India, Startup India, and Women Entrepreneurship Platform (WEP). These schemes have helped in raising awareness, offering financial support, and creating networking opportunities for aspiring women entrepreneurs. However, gaps persist in implementation, outreach, and impact. Therefore, it becomes pertinent to examine what truly influences the success of women-led start-ups in India, beyond just funding and policy.

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Abstract No. 128

**PREVENTING THE EXPLOITATION OF THE ENVIRONMENT
IN WAR AND ARMED CONFLICT COUNTRIES**

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ABSTRACT

The environment often becomes a silent victim during wars and armed conflicts. Natural resources, such as water, forests, and minerals, are often exploited to support military operations, leading to severe and long-term ecological harm. This research focuses on preventing environmental exploitation in war-affected and conflict-prone countries by integrating legal, ethical, and ecological perspectives. It examines how inter national humanitarian law and environmental law can collaborate to protect nature from deliberate or unintentional harm during warfare. Key instruments, such as the Geneva Conventions, the Rome Statute, and United Nations policies, are reviewed to assess their relevance in addressing wartime environmental damage. The study highlights that ecological loss in conflicts not only threatens biodiversity but also deepens humanitarian crises by reducing access to clean air, water, and fertile land. Case studies from recent wars underline the urgent need for more decisive global action and accountability for environmental crimes, often called ecocide. The paper proposes reforms, including enhanced international cooperation, recognition of environmental protection in peace agreements, and post-conflict ecological restoration programs. It concludes that protecting the environment in times of war is a shared responsibility among nations and global institutions. A peaceful future depends on respecting nature, even in the midst of conflict, because the survival of ecosystems ensures the survival of humanity itself.

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Abstract No. 129

**ENVIRONMENTAL EDUCATION,
AWARENESS AND BEHAVIOURAL CHANGE**

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ABSTRACT

Environmental education plays a crucial role in developing awareness, positive attitudes, and responsible behaviours toward the environment. It helps individuals understand ecological issues, equips them with problem-solving skills, and motivates them to adopt sustainable practices. Increased awareness leads to a deeper understanding of human impacts on nature, which further encourages behavioural changes such as reducing waste, conserving resources, protecting biodiversity, and supporting eco-friendly policies. Effective environmental education combines knowledge, experiential learning, and community participation to bring long-term behavioural transformation. By empowering citizens—especially students and youth—it contributes significantly to building a sustainable and environmentally responsible society.

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Abstract No. 130

**GREEN PHARMACEUTICAL CO-CRYSTALS: A SUSTAINABLE
APPROACH TO ENHANCE EFFICACY AND ENVIRONMENTAL
SAFETY OF DRUG SUBSTANCES**

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ABSTRACT

Pharmaceutical co-crystals represent a sustainable alternative to conventional solid-state modification techniques. By combining active pharmaceutical ingredients with safe coformers, co-crystals improve solubility, stability, and bioavailability without altering pharmacological activity. This approach minimizes the need for toxic solvents and reduces manufacturing waste, supporting green chemistry principles. Environmentally conscious synthesis methods such as solvent-free grinding and anti-solvent crystallization further decrease the ecological footprint of drug development. The adoption of co-crystal technology contributes to sustainable pharmaceutical design by optimizing therapeutic efficacy while ensuring environmental safety. This aligns with Sustainable Development Goals related to health, responsible production, and environmental protection. The study highlights the potential of green co-crystal engineering as a forward-looking path for pharmaceutical innovation and social sustainability.

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Abstract No. 131

**SEASONAL VARIATION IN PHYTOPLANKTON DIVERSITY IN
PARVATI ARGH WETLAND OF GONDA DISTRICT (U. P.)**

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ABSTRACT

Wetlands are complex and dynamic ecosystems that perform essential ecological functions such as flood regulation, water purification, nutrient retention, and support of biodiversity. Despite their importance, they face serious threats from human activities, including agricultural runoff, industrial discharges, urbanization, and land-use changes. Parvati Argh, a Ramsar site located in the Gonda district of eastern Uttar Pradesh, is a large, shallow, horseshoe-shaped wetland situated in the Terai region. The present study examined the seasonal variations in phytoplankton density and diversity over a one-year period. A total of 34 genera of phytoplankton were identified, of which 14 belonged to Chlorophyceae, 11 to Bacillariophyceae, 7 to Cyanophyceae, and 2 to Euglenophyceae. The annual distribution revealed that Chlorophyceae dominated the phytoplankton community, contributing 50.52% of the total population, followed by Bacillariophyceae (28.42%), Cyanophyceae (17.35%), and Euglenophyceae (3.71%). Seasonal analysis indicated that phytoplankton abundance was highest during summer, moderate in winter, and lowest during the monsoon season.

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Abstract No. 132

**ROLE OF WOMEN AND TRIBES IN SOCIAL AND
ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Women and tribal communities are crucial for social and environmental sustainability because they are often primary managers of natural resources, possess invaluable traditional knowledge, and lead community-based conservation efforts. Women, in particular, play vital roles as caretakers, producers, and educators, and their deep connection to their local ecosystems is essential for sustainable practices like seed preservation, water conservation, and organic farming. Tribal communities have developed resilience through sustainable resource management and traditional techniques passed down through generations, which are critical for biodiversity and food security. Empowering women and incorporating their knowledge into decision-making processes are essential for achieving long-term environmental and social well-being. Tribal women are central to social and environmental sustainability by acting as custodians of traditional knowledge, managing natural resources, and upholding cultural and community values. They are also at the forefront of environmental movements, using their deep connection to nature to advocate for conservation. *Resource management:* Women are responsible for collecting forest products like firewood, food, and fodder, and have developed deep knowledge of local resources for sustainable management. They also participate in activities like forest fire management and conservation. *Traditional practices:* Women pass down knowledge of traditional medicine, sustainable housing, and other practices that embody a deep respect for the environment. *Environmental activism:* Tribal women have led significant environmental movements, such as the Chipko Movement, where they physically protected trees from being cut down. *Economic roles:* They contribute significantly to the household economy through their work in collecting forest produce and selling goods in local markets. *Empowerment:* Their active role in managing resources and protecting the environment has led to empowerment, with initiatives now focusing on training them in areas like regenerative agriculture.

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Abstract No. 133

CO₂ SEQUESTRATION AND CLIMATE CHANGE MITIGATION

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ABSTRACT

The research focuses on the growth and evaluation of future-generation adsorbent-based approaches to CO₂ capture, with specific reference to catalytic nanostructures grown via green pathways. The overall hypothesis is that appropriately designed nanomaterials can improve CO₂ adsorption capacity, stability, and recyclability under dynamic exhaust environments. The methodology includes synthesis and characterization of nanostructured adsorbents using BET, SEM/TEM, and TGA measurements and subsequent gas adsorption–desorption experiments. Performance is compared with traditional adsorbents to evaluate efficiency and scalability. Key findings classify catalytic nanostructures as being of greater CO₂ adsorption, enhanced response, and better regeneration than normal materials. Observations also see their value to be integrated in industrial exhaust systems for both the reduction of emissions and valorization of CO₂ as fuel, chemicals, or building materials. The research depicts the worth of CO₂ sequestration with materials as a cost-effective climate change mitigation strategy. Besides limiting the greenhouse gas emissions, the process is valuable for transition to clean energy, circular economy, and decarbonization processes on long-term futures. Crossing the capture–use gap, the research explains how environmentally friendly catalytic nanostructures can provide manageable, sustainable, and scalable climate change solutions.

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Abstract No. 134

**DIVERSITY, DISTRIBUTION AND THREAT STATUS OF
VASCULAR PLANTS IN SAMASPUR BIRD SANCTUARY,
RAEBARELI, UTTAR PRADESH**

**Shubham Kumar, Atul Kumar Anand, Aanchal Verma,
Vineet Kumar Singh and Alka Kumari**

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ABSTRACT

This study provides the details of the diversity, distribution, and threat status of vascular plant species within the Samaspur Bird Sanctuary, which is designated as a Ramsar site in 2019, located in the Rae Bareilly district of Uttar Pradesh. During preliminary field surveys, around a total 149 plant species of higher plants consisting of 129 genera and 60 families, with dicots (108 species) have been documented. Among these, Poaceae family has been found as most dominant followed by Euphorbiaceae, Asteraceae, and Solanaceae. The flora is overwhelmingly herbaceous (approximately 86.1%) and distributed throughout the sanctuary area and wetland hydrophyte categories. The primary and most severe threat to this native diversity is the widespread invasion of alien plant species, which account for over 40% of natural flora. Key invasive species like *Pontederia crassipes* (Water hyacinth), *Typha angustata*, and *Ipomoea carnea* are aggressively displacing the native floral species, causing the shrinkage of open water bodies, and restricting waterfowl movement, thereby severely compromising the Sanctuary's ecological integrity. Further studies on threat status and ethnobotanical uses of collected specimens are under progress.

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Abstract No. 135

**RESEARCH FRONTIERS IN GREEN TECHNOLOGY AND
WASTE MANAGEMENT: RECENT DEVELOPMENTS AND
FUTURE TRAJECTORIES**

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ABSTRACT

Recent research in green technology and waste management has yielded significant breakthroughs that address critical sustainability challenges through interdisciplinary approaches. In photovoltaic research, tandem solar cells combining perovskite and silicon layers have demonstrated laboratory efficiencies exceeding 33%, approaching theoretical limits while reducing manufacturing costs through solution-based processing methods. Wind energy research focuses on biomimetic blade designs inspired by humpback whale flippers, reducing turbulence and increasing energy capture by 20-25%. Electrochemical energy storage research has advanced lithium-sulfur and sodium-ion battery chemistries as sustainable alternatives to conventional lithium-ion systems, offering higher energy densities and utilizing abundant materials. Waste management research emphasizes biotechnological solutions and advanced material recovery systems. Enzymatic plastic degradation using engineered PETase variants can depolymerize polyethylene terephthalate at ambient temperatures within hours, contrasting sharply with centuries-long natural decomposition. Microbial fuel cell technologies convert organic waste directly into electrical energy while simultaneously treating wastewater, achieving dual remediation-generation objectives. Hydrothermal carbonization research demonstrates conversion of wet biomass waste into hydrochar, a carbon-rich material suitable for soil amendment or energy applications, without energy-intensive drying processes. Machine learning algorithms optimizing waste collection routes have reduced fuel consumption by 15-30% in pilot studies across multiple municipalities. Life cycle assessment research increasingly guides technology selection by quantifying environmental impacts across production, operation, and disposal phases. Nanotechnology applications in photocatalytic waste treatment show promise for degrading persistent organic pollutants under solar irradiation.

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Abstract No. 137

**IMPACT OF INSECT-INDUCED DAMAGE ON PROTEIN
COMPOSITION OF PEARL MILLET DURING STORAGE**

**Menka Srivastava, S.P. Srivastava, Vaishnavi Gupta,
Ritikesh K Roy, Disha Singh and Vinod Kumar**

Department of Zoology
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ABSTRACT

The present study investigates the impact of insect infestation on the crude protein content of four pearl millet (*Pennisetum glaucum*) varieties—ICMB-155, WCC-75, NDFB-3 (Narendra Chara-3), and ICTP-8203—under storage conditions. Results showed a noticeable increase in crude protein levels after infestation across all varieties. Protein values increased 1.2% in ICMB-155 (from 11.5% to 12.7%), 1.3% in WCC-75 (from 10.8% to 12.8%), 0.9% in NDFB-3 (from 9.9% to 10.8%), and 1.3% in ICTP-8203 (from 12.0% to 13.3%). This apparent rise in protein content may be attributed to the incorporation of insect body tissues, cast skins, and dead insect remnants into the grain mass during infestation, which artificially elevates the measured protein percentage. Such biochemical alterations indicate that insect attack not only deteriorates grain quality but also distorts nutritional parameters during storage. This analysis forms part of a broader assessment being carried out on fifteen pearl millet varieties to understand biochemical responses under insect-induced stress. Beyond their ecological role, pearl millet grains are nutritionally important, being rich in iron, zinc, fiber, antioxidants, and complex carbohydrates. Yet, post-harvest losses by *S. cerealella* reduce both yield and nutritional value. The study shows that factors like grain hardness, biochemical traits, and temperature shape pest performance and directly influence food quality and sustainability. Using resistant, nutrient-rich millet varieties in eco-friendly storage systems can enhance food security; reduce chemical use, and support sustainable, health-focused agriculture under climate change. Moreover, Senior Dr. Prof. S. K. Sinha of GSVM Medical College, Kanpur, also highlighted the significance of millets in improving nutritional security and promoting sustainable agriculture in his statement published in Dainik Jagran, which further reinforces the findings of the present study.

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Abstract No. 138

**A PHARMACEUTICS PERSPECTIVE ON ENVIRONMENTAL
ETHICS, GREEN TECHNOLOGY, AND HUMAN
RESPONSIBILITY IN CANCER PREVENTION**

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ABSTRACT

Pharmaceutics is crucial for improving cancer treatment, but it also raises significant ethical and environmental concerns. Improper disposal of cytotoxic drugs and pharmaceutical waste can contaminate water and soil with carcinogens. Research has found residues of anticancer drugs, including cyclophosphamide and ifosfamide, in hospital effluents and rivers in India, posing mutagenic and ecological risks. These issues highlight the pharmaceutical industry's ethical obligation to adopt eco-friendly and sustainable practices. Innovations in green pharmaceuticals, such as solvent-free synthesis, supercritical CO₂ extraction, and biodegradable nanocarriers, are transforming drug production and reducing environmental impact. Green nanotechnology, featuring carbon quantum dots, lipid-based nanoparticles, and pH-sensitive polymeric micelles, provides safer, biodegradable options compared to traditional heavy-metal-based systems used in targeted cancer therapy. Additionally, following CPCB biomedical waste guidelines for ethical waste management ensures that cytotoxic waste is properly separated and incinerated, reducing risks to healthcare workers and nearby communities. By integrating environmental ethics, green technology, and human responsibility, pharmaceuticals can advance toward a sustainable approach to preventing and treating cancer. These strategies protect both the environment and public health, demonstrating that responsible pharmaceutical innovation is vital for long-term social and environmental sustainability.

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Theme: CLIMATE CHANGE: MITIGATION AND
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6 & 7 December, 2025

Abstract No. 139

**STUDY ON ENVIRONMENTAL AWARENESS AND
ITS INFLUENCE ON WASTE WATER MANAGEMENT
PRACTICES IN URBAN COMMUNITIES**

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ABSTRACT

Urban Communities across the globe are grappling with the immense challenges of managing wastewater effectively. The conventional approach, which often views waste water merely as a problem to be disposed of, is increasingly proving to be unsustainable. This abstract explores the pivotal role of environmental awareness as a transformative force in reshaping urban wastewater management practices. It argues that a shift in public consciousness from apathy to active concern is not just beneficial but essential for the adoption of sustainable solution. As citizens become more educated about the detrimental impacts of polluted water on ecosystem and public health – such as the contamination of rivers, groundwater, and the spread of waterborne diseases – they are more likely to support and adopt responsible practices. This includes reduced consumption of water, the proper disposal of household chemicals and pharmaceutical, and the acceptance of water conservation policies. Furthermore, informed communities exert greater pressure on local governing bodies and municipal corporations to invest in advanced, eco-friendly treatment technologies, such as decentralized treatment plants, water recycling for non – potable uses, and nature based solutions like constructed wetlands. When people see themselves as stakeholders in the health of their local water bodies, they transition from being passive recipients of municipal services to active participants in the water management cycle. In conclusion, environmental awareness acts as a crucial catalyst, driving a paradigm shift in urban wastewater management from a linear 'take-make-dispose' model to a more circular, resilient, and sustainable system that values water as precious resource.

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Abstract No. 140

**ECO-FRIENDLY PEST MANAGEMENT THROUGH *DRACAENA TRIFASCIATA* AND *SOLANUM SURATTENSE* EXTRACTS
AGAINST *COCCIDOHYSTRIX INSOLITA* ON BRINJAL**

**Vaishnavi Gupta, S.P. Srivastava, Menka Srivastava,
Ritikesh Kumar Roy and Vinod Kumar**

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ABSTRACT

The overuse of synthetic pesticides poses a severe threat to biodiversity, soil health, and human well-being. Addressing this, the present investigation explores the synergistic bioefficacy of *Dracaena trifasciata* (snake plant) extract treated with alkaline water and *Solanum surattense* (bhatkatiya) extract as a sustainable dual-plant formulation against the mealybug *Coccidohystrix insolita*, a major pest of brinjal (*Solanum melongena*). Both plant extracts, rich in alkaloids, flavonoids, and saponins, were prepared in aqueous form and tested at three concentrations—5%, 10%, and 15%—under controlled laboratory and field conditions for 45 days. The combined formulation exhibited enhanced pest mortality and improved plant vigor compared to individual treatments. Maximum mortality (up to 79.4%) and minimal reinfestation were observed at 15% concentration, while 10% and 5% showed 62.3% and 41.7% reduction in infestation, respectively. Additionally, brinjal plants treated with the combined extracts demonstrated a 27.8% yield improvement and reduced leaf chlorosis, indicating better physiological health.

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Abstract No. 141

**FOOD MICROBIOLOGY: SIGNIFICANCE,
MICROBIAL DIVERSITY, AND ROLE OF SOFTWARE
TOOLS IN FOOD SAFETY 2025**

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ABSTRACT

Food microbiology is the prime area that helps ensure foods are safe and of good quality globally. It impacts the fundamentals of our method of approach to the production and preservation of food and how we handle the chain of supply. Examples of microorganisms that may be found in food are bacteria, yeasts, moulds, viruses, and parasites. These microbes can ferment food or cause its spoilage and create health hazards. With the evolution of technology in food processing, thermal treatment, fermentation, and more recently non-thermal processes like high-pressure processing, the microbial ecology of foods has changed for the better, thereby increasing their safety while allowing for functional foods to be developed. Software tools and AI-powered platforms are foreseen to constitute the technological changes the food industry is about to go through in 2025 to help manage food safety. Smart systems will provide increased traceability, compliance reporting, training, and environmental monitoring along the full food supply chain, updating traditional HACCP models to further support preventive measures in reducing human error. Such systems will apply real-time analytics, predictive maintenance, and automated risk assessment to quickly identify and address potential dangers while maintaining detailed records for regulatory checks and audits. Food microbiology is increasingly converging with digital technology to create enhanced food safety processes and operational efficiencies, catalyzing a more proactive approach toward risk management. As new knowledge about microbes continues to evolve and technological solutions keep pace, interdisciplinary approaches would be called for assuring food integrity and public health—a new era in food science which is all about prevention, transparency, and innovation.

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Abstract No. 142

**CLIMATE CHANGE, MITIGATION, AND ENVIRONMENTAL
ETHICS FOR HUMAN WELLBEING: AN INTEGRATED
APPROACH FOR A SUSTAINABLE FUTURE**

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ABSTRACT

Climate change has become one of the most pressing global issues of our time, posing serious threats to ecological balance, biodiversity, food security, public health, and the overall wellbeing of humanity. With rising temperatures, extreme weather patterns, rising sea levels, and the degradation of ecosystems, we see a deepening of socio-economic disparities and a disruption of community resilience. While it's crucial to implement mitigation strategies—like cutting emissions, embracing renewable energy, and enhancing carbon capture—their success hinges on embedding strong environmental ethics that steer responsible human behaviour. Ethical principles grounded in justice, equity, and stewardship lay the groundwork for sustainable decision-making, ensuring that climate action serves both current and future generations. This paper offers a comprehensive and multidisciplinary look at climate change, pathways for mitigation, and the role of environmental ethics in fostering sustainable human wellbeing. It underscores the necessity for scientific approaches to align with ethical considerations to build resilient societies. The discussion delves into global and national mitigation policies, the significance of biodiversity conservation, the value of climate education, and the vital contributions of women and indigenous communities as environmental leaders. The study's findings emphasize that climate mitigation and environmental ethics are two sides of the same coin when it comes to enhancing human wellbeing. A sustainable future demands a blend of technological progress with moral accountability, the strengthening of institutional frameworks, and the promotion of global collaboration. By adopting ethical standards, we can pave the way for a more sustainable and equitable world.

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Abstract No. 143

**PCR AND NGS APPROACHES: TRADITIONAL AND
MOLECULAR METHODS FOR MICROBIAL DETECTION 2025**

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ABSTRACT

Clinical diagnostics as well as environmental and food safety monitoring rely on the accurate identification of microorganisms. The ability to isolate and identify viable organisms through culture-based techniques has for a long time and remains the gold standard. However, the traditional techniques are often time-consuming, have low sensitivity, and are unable to detect non-culturable or fastidious organisms. To overcome these limitations, molecular techniques such as the Polymerase Chain Reaction (PCR) and Next Generation Sequencing (NGS) have been developed and widely used. Microbial DNA can be detected with extreme sensitivity by PCR, even for those organisms which are impossible or very difficult to culture. NGS further enables comprehensive genomic and metagenomic analyses which help in identifying emerging pathogens and antimicrobial resistance determinants. This review aims to evaluate the three methods of detection: culture-based methods, PCR, and NGS, and analyze their working principles and strengths, weaknesses, and cases when they are most appropriate to use. There is no question that culture is important in demonstrating the presence of live pathogens and in performing subsequent phenotypic tests. However, molecular techniques provide faster results with greater detail. In conclusion, traditional methods coupled with molecular approaches can improve the accuracy, speed, and breadth of detection of microorganisms, which can be beneficial for medical, industrial, or environmental purposes.

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Abstract No. 144

ENVIRONMENTALLY INTEGRATED INVENTORY MODELLING

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ABSTRACT

Environmental degradation, climate change, and resource scarcity have intensified the need for sustainable operations across global supply chains. Inventory modelling, traditionally focused on minimizing cost and optimizing operational efficiency, has evolved into a discipline deeply intertwined with environmental considerations, including carbon emissions, ecological footprints, waste management, reverse logistics, and circular economy principles. This paper critically examines the intersection of environmental sustainability and inventory modelling, discussing how economic order quantity (EOQ), production inventory models, stochastic demand systems, and multi-echelon frameworks adapt to environmental constraints. Emerging models such as carbon-regulated EOQ, green production-inventory systems, energy-aware supply chains, and closed-loop inventory systems are analyzed. The research synthesizes recent advancements in green logistics, environmental policy impacts, and optimization algorithms used for sustainable inventory control. Furthermore, the study highlights methodological gaps, ethical concerns, and future research directions emphasizing artificial intelligence (AI), life cycle assessment (LCA), and real-time environmental monitoring.

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Abstract No. 145

**DIVERSITY OF SOIL CYANOPROKARYOTES AND
ALGAE IN NURSERY OF ACHARYA JAGADISH CHANDRA
BOSE INDIAN BOTANIC GARDEN, HOWRAH**

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ABSTRACT

Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah spread in 273 acres on the west bank of the river Ganga (Hooghly). Geographically it is located at 22°35'N latitude and 88°21'E longitude at the elevation of 4.6m above the sea level. There are 25 divisions in Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG), Howrah. Nursery number 01 is situated in Division number 06 which is the main nursery of AJCBIBG. Soil is the top layer of the Earth's surface, composed of a mixture of minerals, organic matter (humus), air, and water. Cyanoprokaryotes and Algae are important in nurseries because they boost plant growth, improve soil fertility, and protect against diseases. They act as bio-fertilizers by fixing nitrogen and can be used as bio-stimulants and bio-pesticides to create stronger, healthier plants. The main purpose of this is to study the diversity of Algae and Cyanoprokaryotes on topmost layer of the soil of nursery of AJCBIBG which is rich in plantation and humid environment, large variety of Cyanoprokaryotes and Algae present in this environment which is found through in this study. During study altogether 61 species of different classes (Cyanophyceae/ Cyanobacteria/ Cyanoprokaryota, Chlorophyceae, Chrysophyceae, Coscinodiscophyceae, Bacillariophyceae, Klebsormidiophyceae, Trebouxiophyceae and Zygnematophyceae) of microalgae of soil surface were identified. This is a first study report of diversity of Cyanoprokaryotes and Algae of nursery of AJCBIBG, Howrah.

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Abstract No. 146

**AGRONOMIC AND ENVIRONMENTAL IMPACTS OF
WASTEWATER IRRIGATION ON PULSE CROPS
(*VIGNA RADIATA* L. AND *LENS CULINARIS* L.)
IN UTTAR PRADESH, INDIA**

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ABSTRACT

Pulses play a vital role in the agriculture, economy, and nutritional security of Uttar Pradesh, serving as a major source of dietary protein and contributing to soil fertility through biological nitrogen fixation. With increasing freshwater scarcity, the use of sewage water for irrigation has become a widespread practice among farmers. Although sewage water contains beneficial organic matter and essential nutrients such as nitrogen, phosphorus, and potassium that can enhance soil fertility and crop growth, it may also carry toxic heavy metals and pathogenic microorganisms that pose significant risks to plant health and food safety. The present study evaluates the effects of sewage water irrigation on the growth and productivity of key pulse crops, including *Vigna radiata* (mung bean) and *Lens culinaris* (lentil), cultivated in Uttar Pradesh, India. Sewage water collected from local sources was used to irrigate experimental plots, and its impact on germination percentage, plant height, chlorophyll content, and seed yield was assessed in comparison with crops irrigated using groundwater. The results indicate that while sewage water initially promoted better growth due to its higher nutrient content, long-term application resulted in the accumulation of heavy metals in both soil and plant tissues. This led to adverse effects on crop physiology and potential concerns regarding food quality and soil sustainability. The study underscores the necessity for effective treatment and monitoring of sewage water prior to its use in agriculture to ensure sustainable pulse production, safeguard environmental health, and protect consumer safety.

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Abstract No. 147

**ROLE OF ALLELOPATHY IN FOOD AND HEALTH SAFETY &
SUSTAINABLE DEVELOPMENT OF NATURAL RESOURCES**

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ABSTRACT

Allelopathy, the biochemical interaction among plants through the release of natural compounds, plays a significant role in enhancing food and health safety while supporting the sustainable development of natural resources. Allelochemicals help suppress weeds, pests, and pathogens, reducing dependence on synthetic pesticides and herbicides that leave harmful residues in food and the environment. This promotes safer crop production and minimizes human exposure to toxic chemicals. Additionally, many allelopathic compounds possess medicinal properties, contributing to nutraceutical and pharmaceutical development. In ecological terms, allelopathy supports soil fertility, biodiversity, and water conservation and reduces environmental pollution by lowering chemical inputs. By integrating allelopathic species into crop rotations, cover cropping, and agroforestry systems, agriculture can move toward more eco-friendly, resilient, and resource-efficient practices. Thus, allelopathy offers a natural and sustainable pathway to improve food safety, public health, and long-term environmental sustainability.

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Abstract No. 148

**FROM CONTAMINATED SOILS TO CATALYTIC SOLUTIONS:
NOVEL LINB DEHALOGENASES FOR
ENHANCED HCH DEGRADATION**

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ABSTRACT

Hexachlorocyclohexane (HCH) is a persistent organic pollutant that has been used extensively in the past for around sixty years for the protection of crops and control of vector borne diseases. HCH contains 60-70% α -HCH, 5-12% β -HCH, 10-15% γ -HCH, and 6-10% δ -HCH isomers. Later when the toxicity of HCH-isomers was understood, the formulations containing γ -HCH (also referred by its trade names Gamaxene, lindane etc.), the only isomer that has insecticidal property, was purified from t-HCH and used. The remaining 'HCH-muck' is discarded, whose large amounts are present at different dump sites across the world and pose a serious risk to health. Bioremediation of these contaminated sites is therefore highly desirable. Enzyme 'Haloalkane dehalogenase LinB' mediates the first step in the metabolism of β - and δ -HCH. Several variants of LinB have been characterized from different HCH-degrading microorganisms. LinB-UT26 and LinB-B90, which differ in their activity for β - and δ -HCH suggested that more variants of these might be present in contaminated soils, but have not been accessed so far due to unknown culture conditions. This research explores the isolated novel LinB variants, which were obtained by PCR amplification from metagenomic DNA of HCH-contaminated soils. Distinct variants of each gene were expressed in *E. coli* and their studies on the activity and enantioselectivity towards different HCH isomers and their pentachloro cyclohexenes (PCCH) were evaluated. Novel LinB dehalogenase variants from contaminated soils, demonstrating significant diversity in enzyme properties and catalytic activities. LinB's versatility is not limited to HCH. It has also been shown to transform other halogenated compounds, expanding its applicability in environmental remediation strategies. These findings provide valuable insights for developing enhanced bioremediation strategies for HCH-contaminated environments.

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Abstract No. 149

**IMPACT OF TEMPERATURE EXTREMES ON GRAIN FILLING
AND STABILITY YIELD IN MAJOR CEREAL CROPS**

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ABSTRACT

Temperature extremes pose a significant threat to global cereal production, directly impacting grain filling processes and overall stability in wheat, rice, and maize. Increasing temperature reduces yield by reducing the grain filling period, while extreme temperatures during the blooming stage reduce cereal kernel count, thickness, and quality. Current research demonstrates that for wheat, a 1°C temperature increase results in a 6.1% yield loss when temperature rise is below 2.38°C; however, when it exceeds 2.38°C, yield loss rises to 8.2% per 1°C warming. For corn in the southeastern United States, every 1°C increase in maximum temperature causes a 34% yield reduction. Extreme temperature events, characterized by short-term spells of a few days with temperature increases over 5.0°C above normal, cause frost-induced sterility and grain abortion, while extreme heat decreases grain number and reduces grain filling duration. The critical period around flowering in cereals is particularly vulnerable to temperature stress, establishing grain number per unit area. Under 2°C warming, the probability of >10% yield loss in major maize-producing countries reaches 46-69%, with synchronized production shocks across all four top producers increasing from virtually 0% currently to 6% under 2°C warming and 87% under 4°C warming. This research emphasizes the urgent need for developing heat-tolerant cultivars, optimizing agronomic management practices, and implementing climate-resilient breeding programs to ensure food security for the growing global population under accelerated climate change scenarios.

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Abstract No. 150

**BRAIN–OVARY NEUROENDOCRINE INTERACTIONS DURING
THE FEMALE GONADAL CYCLE OF FRESHWATER CATFISH,
HETEROPNEUSTES FOSSILIS (LINN.)**

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ABSTRACT

The present study examines the structural and functional relationships between brain neurosecretory cells (NSCs) and the female gonadal cycle in the freshwater catfish *Heteropneustes fossilis*. Neurosecretory cells located in the preoptic nucleus and hypothalamus play a pivotal role in regulating reproductive physiology through the release of gonadotrophic neurohormones. Seasonal histological observations revealed marked cyclic changes in NSC morphology, including variations in cell size, nuclear prominence, cytoplasmic granulation, and staining intensity. These neurosecretory fluctuations showed a strong correlation with distinct ovarian developmental stages. During the preparatory and pre-spawning phases, NSCs exhibited heightened activity with dense granulation and increased neurosecretory material within the hypothalamo–hypophysial tract, indicating elevated gonadotrophic stimulation required for vitellogenesis. Conversely, during spawning and post-spawning phases, NSCs displayed reduced activity and secretory depletion corresponding to ovulation and subsequent ovarian regression. The findings demonstrate a clear synchrony between neurosecretory regulation and the reproductive cycle of *H. fossilis*, emphasizing the essential role of hypothalamo–hypophysial control in teleost reproduction and offering insights beneficial for aquaculture breeding strategies.

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Abstract No. 153

**HARNESSING PLANTS FOR MICROPLASTIC REMEDIATION:
ADVANCES AND PROSPECTS IN INDUSTRIAL
CONTAMINATION ZONES**

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ABSTRACT

A viable and sustainable method for addressing microplastic contamination from plastic manufacturing sectors is phytoremediation. This environmentally beneficial method uses certain plants, called hyperaccumulators, to filter plastics from water (phytofiltration), collect microplastics through roots and leaves (phytoaccumulation), and immobilise them in soil (phytostabilisation). This study aims to show that terrestrial and aquatic plants can absorb and break down a variety of microplastic particles, reducing their spread throughout the environment. Long-term remediation is supported by plant root exudates and related rhizosphere microorganisms, which further promote plastic decomposition and lower phytotoxicity. Such as determining the best plant species, controlling the stress that plastics cause to plants, and making sure that accumulated plastics are recovered or recycled continue to be crucial. Incorporating phytoremediation into frameworks for managing plastic waste and treating industrial wastewater could greatly lower microplastic contamination, improve ecosystem recovery, and advance circular sustainability. Significant phytoremediator plants include terrestrial plants like fava bean (*Vicia faba*) and lettuce, which exhibit root adsorption of plastics; aquatic species like water hyacinth (*Pontederia crassipes*) and duckweed (*Lemna minor*), which efficiently adsorb microplastics from water; and plants like okra (*Abelmoschus esculentus*) whose extracts have demonstrated high microplastic removal efficiency. Future promising plants being studied for improved microplastic degradation include cattail (*Typha latifolia*), which is used in artificial wetlands for contaminant filtration, vetiver grass (*Chrysopogon zizanioides*), which is known for its strong root system and pollutant tolerance, and genetically modified plant varieties that express enzymes that can more effectively break down plastic polymers.

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Abstract No. 154

**INFLUENCE OF PH, TEMPERATURE AND TOTAL HARDNESS
ON THE LETHAL TOXICITY OF PHENOL TO FRESHWATER
FISH *LEPIDOCEPHALICHTHYS GUNTEA***

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ABSTRACT

Phenolic compounds are found as pollutants in aquatic habitats and has several sources including industrial wastes, coal, wood distillation, road tars, petroleum refining, chemical and plastics manufacturing and they enter natural water causing contamination and affecting fishes and other aquatic organisms. The climate change and acid rain are changing the physicochemical nature of water and when these changes occur and presence of toxic chemical phenol in water drastically affect fish physiology and kill fish. Physicochemical factor like temperature, total hardness and pH of water manipulates the toxicity of phenol to fish. So the static renewal bioassays were done for 96 hours to study the influence of temperature, pH and total hardness on the lethal toxicity of phenol to the freshwater fish *Lepidocephalichthys guntea*. The studies shows that phenol toxicity decreased as the pH, temperature and total hardness of the water increased to the said fish. The 24,48,72 and 96 hours LC₅₀ values were found out at temperature of 20°C, 25°C, 30°C, respectively, The 24,48,72 and 96 hours LC₅₀ values for total hardness water as CaCO₃ of 30 mg/l, 100 mg/l and 250 mg/l. The 24,48,72 and 96 hours LC₅₀ values were calculated at pH 6.0, pH 7.5 and pH 9.0 respectively for the said fish exposed to phenol were studied.

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Abstract No. 155

**METAGENOMIC APPROACHES IN MICROBIAL
BIOREMEDIATION OF INDUSTRIAL TOXIC DYES:
INSIGHTS INTO FUNCTIONAL DIVERSITY AND
MECHANISTIC PATHWAYS**

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ABSTRACT

One of the main contributors of industrial dye effluents released from textile, leather, paper, and other related industries that are still very much in the environment, is their very complex aromatic structures, high stability, and the toxic by-products that get into the water and land ecosystems and cause harm. The common physical and chemical methods of treating such effluents often do not succeed in getting the complete mineralization and, furthermore, produce dangerous waste. Therefore, the need for eco-friendly and sustainable alternatives is further emphasized. Microbial bioremediation is the process that has been developed as a non-polluting and more cost-effective way of treatment, using the enzymatic capability of bacteria, fungi, and microbial consortia to break down and render harmless dyes. The gradual innovations made in the field of metagenomics have turned the study of dye-degrading microbiomes on its head, yielding to the discovery of their teeming variety in taxonomy, the functional gene pools, and the metabolic pathways. High-throughput sequencing and bioinformatics have made it possible to discover new enzymes such as azo-reductases, laccases, and dye-decolorizing peroxidases, while also uncovering the important contribution of plasmids and horizontal gene transfer in the spreading of these biodegradative traits. In addition to that, metagenomic understanding aids in building the productive and innovative biofilm-based setups and synthetic consortia for industry wastewater treatment. It is suggested that future research should be a combination of long-read and single-cell genomics, multi-omics platforms, and artificial intelligence to not only predict metabolic interactions but also to engineer microbial communities and keep track of pollutant transformation in real-time. Collectively, metagenomics brings to the table a thorough and inclusive structure that helps in the development of next-generation sustainable dye bioremediation strategies involving molecular discovery and environmental applications.

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Abstract No. 156

ENVIRONMENT AND SEX DETERMINATION IN FISH

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ABSTRACT

Among vertebrates, fishes display an extraordinary diversity and flexibility in sex-determination systems, with even closely related species often differing in their mechanisms. Teleosts, in particular, experience frequent shifts in sex-determining strategies, providing unique opportunities to explore the molecular and evolutionary processes that drive such changes. Genetic Sex Determination (GSD) occurs in both freshwater and marine species, represented by the XX/XY (male heterogamety) and ZZ/ZW (female heterogamety) systems. Unlike mammals, however, the master sex-determining genes in fishes vary across species, and their sex chromosomes are often homomorphic (morphologically indistinguishable). Sex determination in fishes can be broadly classified into three categories: (i) Genetic Sex Determination (GSD), (ii) Environmental Sex Determination (ESD), and (iii) mixed systems where both genetic and environmental cues interact. In ESD, external factors such as temperature, pH, salinity, social interactions, or exposure to endocrine-disrupting chemicals influence sexual fate. Although often regarded as an ancestral mechanism gradually replaced by chromosomal systems, ESD persists in several fish taxa. Recent advances in understanding sex determination, sex chromosome evolution, reproductive strategies, and sexual dimorphism have informed practical applications in aquaculture, particularly in sex control. Despite the striking diversity of sex-determination mechanisms in teleosts, one highly conserved feature is the central role of oestrogens and the aromatase enzyme complex (P450arom), encoded by the Cyp19a1a gene, which is crucial for gonadal differentiation. This paper emphasizes the importance of Cyp19a1a while providing insights into the proximate mechanisms underlying transitions between different sex-determining systems.

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Abstract No. 157

**MICROBIAL ASSISTED REMEDIATION OF HEAVY METAL
POLLUTION FOR ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Contamination by heavy metals poses a significant worldwide environmental issue because of the enduring, toxic, and non-biodegradable characteristics of metals like lead (Pb), cadmium (Cd), mercury (Hg), arsenic (As), chromium (Cr), nickel (Ni), and copper (Cu). Microbial remediation (bioremediation) involves utilizing bacteria, fungi, algae, and actinomycetes to alter, stabilize, or eliminate heavy metals from ecological systems. Microorganisms provide a sustainable, cost-effective, and effective method for removing heavy metals from soil, water, and industrial wastewater. Microbes inherently interact with metals in their surroundings and have developed multiple defense and detoxification strategies, enabling them to be effective in remediation. Microbial-mediated remediation offers a strong biological approach to address heavy metal toxicity via processes such as biosorption, biomineralization, biotransformation, and exopolysaccharide production, allowing microbes to effectively diminish the mobility and toxicity of pollutants. Progress in genetic engineering, nanotechnology, and microbial ecology, offers improved efficiency, scalability, and adaptability of microbe-driven remediation to various contaminated sites. In the future, we can utilize genetically modified microbes (GEMs), consortium-driven cleanup, nanobioremediation, immobilized cell methods, bioelectrochemical systems, metagenomics, and the integration of omics technologies with phytoremediation.

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Abstract No. 159

ROLE OF MYCO-PARASITIC FUNGI IN ENVIRONMENT

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ABSTRACT

Myco-parasitic fungi, which parasitize other fungi, play a crucial ecological role in maintaining environmental balance and regulating fungal populations in natural and agricultural ecosystems. These fungi exhibit diverse parasitic strategies, ranging from necrotrophy to biotrophy, allowing them to influence nutrient cycling, decomposition, and biological control processes. Species such as *Trichoderma*, *Coniothyrium*, and *Pythium oligandrum* are well-known myco-parasites that suppress plant pathogenic fungi through mechanisms like mycoparasitism, competition, antibiosis, and enzymatic degradation. Their potential as natural biocontrol agents contribute significantly to sustainable agriculture by reducing the dependency on chemical fungicides and mitigating environmental pollution. Moreover, myco-parasitic fungi enhance soil health by promoting microbial diversity and facilitating organic matter turnover. Emerging research highlights their role in ecosystem resilience under changing climatic conditions, as they help regulate pathogen dynamics and support plant-fungal symbioses. Understanding the molecular interactions and signaling pathways governing mycoparasitic relationships can lead to innovative applications in bioremediation, soil restoration, and integrated pest management. Therefore, myco-parasitic fungi represent an ecologically vital and biotechnologically valuable group for environmental sustainability.

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Abstract No. 160

**MUSEUM ENVIRONMENTAL RESPONSIBILITY INITIATIVES
TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS**

Al Shaz Fatmi

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ABSTRACT

Museums are among the most trusted public institutions, and this legacy can be harnessed to deepen as well as disseminate knowledge about environmental responsibility among individuals. This will be a positive and fruitful effort in carbon peaking and achieving carbon neutrality. To achieve the target, it is necessary to illuminate a pathway towards a green metamorphosis in India. A cognizant understanding of various clean energy efforts will lead to achieving the Sustainable Development Goals (SDGs) set by UNESCO. Museums are both Scientific and Cultural institutions housed in magnificent buildings amidst a large landscape, offering the public access to educational, entertaining, and learning experiences. Nationwide, there are 1176 officially recorded museums, and alone in Uttar Pradesh, there are 141 established and 34 upcoming museums. It gives an outline for a pan-India network of Museums. Millions of visitors come to visit the museum or participate in indoor or outdoor activities. The display areas are illuminated with lights, and other spaces are equipped with various electrical equipment, consuming a reasonable amount of energy. Museums need to leverage their leadership and advocacy roles to catalyse low-carbon consumption practices across society. The study explores the museum sector's energy dynamics through recycling of the exhibition materials, carbon footprint assessments for the museum and staff, clean energy practices, development of a tailored carbon emission accounting framework, and ways to reduce energy consumption. It will also deal with various practices museums can adopt as emission reduction efforts. The role of the museum for mobilising visitors to reduce their carbon footprints and decarbonization moves will be discussed. The research will describe several decarbonising strategies that can be adopted or enhance those already in practice, technical platforms for carbon assessment and emission reduction efforts in the museum sector. It will be novel research, but the impact will be higher and will give a global platform to set forth the plans for this untouched but important sector. To achieve the SDGs, the research will serve as a benchmark study in the field of museology.

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Abstract No. 161

**WOMEN'S PARTICIPATION IN NATURAL RESOURCE
MANAGEMENT AND SUSTAINABLE LIVELIHOODS:
A STUDY OF KANPUR DEHAT DISTRICT (U.P.)**

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ABSTRACT

This study examines the role of rural women in natural resource management and their impact on sustainable livelihoods, using evidence from Kanpur Dehat District in Uttar Pradesh. It investigates how women engage with land, water and forest resources; how their involvement contributes to household income and community well-being; and how spatial disparities across the district affect both resource access and livelihood outcomes. Using a mixed-methods approach, the research utilises block-wise quantitative data on indicators such as female literacy, sex ratio, land access and participation in resource-management activities, and complements this with qualitative field interviews of women engaged in agriculture, self-help groups and resource conservation. The findings highlight significant variations in women's resource-management roles and livelihood benefits across different blocks. Women in better-connected blocks with higher education levels and stronger institutional support showed greater agency, higher incomes and more sustainable practices, whereas those in remote blocks faced constrained resource access, lower education and limited economic opportunities. The study emphasises the importance of strengthening women's land-rights, enhancing local institutional support and addressing regional service gaps to ensure inclusive, sustainable development. These insights are relevant for policy-makers seeking to advance the Sustainable Development Goals, especially SDG 5 (Gender Equality) and SDG 15 (Life on Land).

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Abstract No. 162

**CLIMATE CHANGE, COMMUNITY RESILIENCE AND HUMAN
WELL-BEING: INTEGRATING LOCAL ACTIONS WITH
ECOSYSTEM-BASED MITIGATION STRATEGIES**

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ABSTRACT

Climate change is one of the most critical environmental and socio-economic challenges of the 21st century, influencing ecosystems, economies and the overall well-being of human societies. Rising global temperatures, altered precipitation patterns, ecosystem degradation and escalating pollution levels have intensified health risks, food insecurity and livelihood vulnerabilities particularly for marginalized and rural communities. This study explores the interconnections between climate change and human well-being by bridging global mitigation frameworks with localized adaptation and resilience-building initiatives. It highlights the importance of renewable energy transitions, afforestation drives, climate-smart agricultural practices and carbon-efficient technologies in reducing greenhouse gas emissions while strengthening community resilience and socio-economic stability. The study also highlights the pivotal role of ecosystem-based and community-led interventions such as sustainable water resource management, wetland conservation, decentralized clean energy systems and traditional ecological knowledge, in enhancing adaptive capacities. Integrating these localized strategies with national climate policies and global frameworks like the Paris Agreement and Sustainable Development Goal-13(SDG-13) can foster inclusive, equitable and sustainable climate action. Furthermore, the paper explores the integration of climate mitigation strategies with public health initiatives, behavioural transformation and participatory governance frameworks to promote holistic and equitable climate responses. By aligning technological innovation, policy coherence and community empowerment, societies can advance sustainable development pathways that protect both planetary ecosystems and human well-being.

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Abstract No. 163

**HARNESSING MANGANESE FOR SUSTAINABLE WHEAT
PRODUCTION IN NUTRIENT DEFICIENT SOIL**

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ABSTRACT

Due to several environmental factors, soil degradation significantly reduces mineral availability and eventually on crop productivity. The sustainable use of soil for agriculture, Manganese (Mn) which is an essential micronutrient, plays a critical role in plant growth, oxidative stress management, and metabolic processes in plants. This study investigates the effects of manganese sulphate supply at varying concentrations (0.0 μM , 10.0 μM , 50.0 μM , and 100.0 μM) on wheat (*Triticum aestivum* L., variety HD-2967) grown in degraded soil collected from areas near to Gomti River in Lucknow district. Wheat plants were grown in these degraded soil collected and assessed plant growth, antioxidative enzymes (catalase, peroxidase, ascorbate peroxidase, superoxide dismutase, and glutathione) activities, pigment concentrations, and reproductive yield. Results revealed that 10.0 μM (Sufficient concentration) of manganese sulphate significantly enhanced plant height, dry matter yield, total chlorophyll content, enzyme activities, and reproductive output, including bigger grain size in wheat plants. Conversely, absence of manganese supply (0.0 μM) caused interveinal chlorosis and reduced growth, while toxicity at 100.0 μM impaired photosynthesis and reproductive yield of wheat plants grown in collected soil sample. These findings highlighted the importance of optimal manganese supplementation for improving wheat performance in nutrient-poor soils, with 10.0 μM identified as the ideal concentration for maximizing growth and reproductive yield. This research provides valuable insight for sustainable agriculture in degraded soil environments.

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Abstract No. 164

**ASSESSING FARMERS' AWARENESS AND CONSTRAINTS
TO CLIMATE-SMART AGRICULTURE ADOPTION
IN THE INDO-GANGETIC PLAINS**

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ABSTRACT

The hindrance of climate change disturbs agricultural production as this sector is inherently sensitive to climatic conditions. The agricultural system responds to a changing climate through the process of adaptation. Climate-smart agriculture is an approach that requires various elements embedded in local contexts, both on-farm and beyond the farm. The present paper tries to understand the farmers' preferences and adaptation barriers to climate-smart agriculture practices in the IGP region. The outcomes of the study disclosed that the farmers of the study area are aware of the Climate-smart agriculture practices. According to the results of the survey, farmers prefer to use CSA practices like crop rotation, modern irrigation techniques, change in pattern, and adoption of fertilisers & chemicals, change in crop variety, Modification in sowing, planting, fertilising, and harvesting practices, water control mechanism, using early maturing, drought-resistant crop varieties, etc. The farmers of the study area face many constraints while adapting to CSA practices, including a Lack of funds for adaptation of CSA practices, a Lack of support from agriculture institutions, a Lack of financial support from the government, a Lack of credit facilities from financial institutions, a Lack of awareness of CSA practices, Lack of market access.

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Abstract No. 165

**CORPORATE ENVIRONMENTAL RESPONSIBILITY IN
ACTION: AN ANALYTICAL STUDY OF THE VANTARA VAN
PROJECT BY RELIANCE INDUSTRIES**

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ABSTRACT

To strengthen India's industrial development without compromising environmental stability, the Government of India has encouraged industries to participate in carbon credit programs by adopting green and sustainable practices. This initiative seeks to harmonize economic growth with ecological responsibility and to inspire industries to contribute actively to climate action. In response to this National Vision, Chairman and Managing Director of Reliance Industries Limited (RIL), Mr. Mukesh Ambani has emphasized Sustainability, Green Energy, and Animal Welfare Initiatives—one notable example being “Vantara,” a large-scale conservation and animal rescue project launched under the Reliance Foundation. The Vantara Van Project reflects a strong sense of ecological awareness within industrial frameworks. It provides protection and rehabilitation for numerous endangered species, reaffirming a corporate resolve to safeguard biodiversity and restore natural habitats. By aligning industrial expansion with environmental ethics, the initiative demonstrates how corporate efforts can meaningfully support carbon neutrality and ecological resilience. This paper evaluates the broader environmental, social, and economic significance of the Vantara Van initiative. It examines how such projects can strengthen India's carbon credit ecosystem, promote biodiversity conservation, and encourage responsible industrial behavior. The study concludes that initiatives like Vantara Van can serve as guiding models for integrating industrial innovation with sustainable development and long-term environmental stewardship.

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Abstract No. 166

**SUSTAINABLE ANTIMICROBIAL STRATEGIES USING
GREEN-SYNTHEZIZED COPPER NANOPARTICLES**

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ABSTRACT

Abstract-Green-synthesized copper nanoparticles (CuNPs) have gained recognition as an effective sustainable antimicrobial approach, which is attributed to their environmentally friendly production methods and strong biological activities. The natural extracts from plants, algae, bacteria, or fungi are used in the green synthesis method as reducing agents, thus providing an environmentally friendly alternative to the conventional chemical synthesis, which usually employs toxic reagents and harsh conditions. The green synthesis of copper nanoparticles has many advantages over traditional ones; including eco-friendliness, lower costs, and the elimination of hazardous substances. Moreover, this method is in line with the principles of green chemistry, which focuses on the development of safer synthesis process and the use of less hazardous materials. Copper nanoparticles synthesized through green methods possess substantial antimicrobial activity, which has been demonstrated against a wide range of pathogens. The nanoparticles exhibit strong activity against bacteria such as *Streptococcus mutans* and *Klebsiella* species. CuNPs show the typical characteristics mostly relevant to biomaterials. The green-method copper nanoparticles not only were good antimicrobials but also offered the benefits of low toxicity and high biocompatibility besides. The example of *C. papaya* leaves shows that the produced CuNPs have notable antioxidant and anticancer properties, and their use in medicine is encouraging. The scope of these nanoparticles is not only restricted to health care domains; it can be extended to environmental cleanup, where they can be used for example to treat wastewater because of their ability to absorb the pollutants. All in all, the sustainable antimicrobial techniques relying on the green-synthesized copper nanoparticles possess a bright future, mainly due to their potent antimicrobial properties, compatibility with living organisms, and eco-sustainable manufacturing processes that are mutually supportive in nature. The very same traits render them significant through the medical as well as the environmental sectors.

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Abstract No. 167

**SUSTAINABLE SEED PRIMING: ECO-FRIENDLY IRON
NANOPARTICLES TRANSFORM IN FINGER MILLET VIGOR**

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ABSTRACT

Iron deficiency constrains crop productivity, manifesting as interveinal chlorosis and stunted growth, yet biogenically synthesised iron nanoparticles (FeNPs) offer a sustainable intervention. In *Eleusine coracana* L., commonly known as finger millet, a nutritionally significant crop, we investigated FeNPs to ameliorate iron deficiency and enhance physiological performance. FeNPs, produced via plant extract-mediated synthesis to circumvent the environmental drawbacks of chemical methods, were applied at concentrations of 25.0, 50.0, 100.0, and 200.0 ppm through seed priming. The 50ppm treatment proved optimal, significantly increasing plant height, root length, relative water content, and photosynthetic pigment content. Additionally, it elevated proline accumulation, a stress-protective metabolite, while reducing hydrogen peroxide levels and lipid peroxidation, indicating enhanced stress tolerance. All FeNPs treatments outperformed the untreated control, although the 200ppm concentration yielded suboptimal results, suggesting a threshold effect. This eco-friendly synthesis method produces highly bioactive FeNPs, delivering iron with minimal ecological impact. Our findings underscore the efficacy of biogenic FeNPs in addressing micronutrient deficiencies, offering a scalable approach to bolster crop resilience in iron-deficient soils. By integrating green nanotechnology with agricultural practice, this study advances sustainable crop enhancement, supporting improved yields and nutritional quality of finger millet, a vital staple in resource-limited regions. These results advocate for further exploration of biogenic nanoparticles to optimize plant nutrition and promote environmentally conscious agriculture, aligning with global food security goals.

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Abstract No. 168

**CLIMATE CHANGE IMPACT ON RIVERINE FISHERIES OF
UTTAR PRADESH AND ETHICAL ISSUE OF SUSTAINABILITY:
AN OVERVIEW**

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ABSTRACT

Riverine fisheries will face knock-out effect due to climate change driven ecological changes. Variations in ecosystems enormously impact inland fisheries, especially riverine. Present study showed that river basins of Uttar Pradesh in north India have faced a great impact of climate change on productivity, diversity and sustainability of their fisheries. With this view the study attempted to identify change in the ecosystem, effect on catch quantity, species diversity, invasion of species and analyses Ethical aspects to create awareness, suggest appropriate measures for policy formulation and conservation. A very high perception of Climate Change is present among the fishing community. Ethical values are present in thoughts of the Fishing community but lacking in action. Climate smart ethical strategy of development will lead to sustainable utilization of invaluable aquatic biological sources by present and future generations.

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Abstract No. 169

**LUCKNOW'S HIDDEN TOXINS: SPATIAL VARIATION IN SOIL
HEAVY METALS FROM DRAINWATER IRRIGATION**

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ABSTRACT

Heavy metal contamination of agricultural soils through untreated urban wastewater irrigation constitutes a pressing threat to soil health, crop safety, and environmental sustainability. This study investigates the differential accumulation of chromium (Cr), lead (Pb), arsenic (As), and cadmium (Cd) in garden soils irrigated with effluents from four major drainage systems in Lucknow, India: Hanuman Setu, China Bazar, Nishat Ganj, and Jopling Road. Surface soil samples (0–15 cm) were collected following standardized irrigation cycles. Heavy metals were extracted using aqua regia digestion (ISO 11466) and quantified via inductively coupled plasma mass spectrometry (ICP-MS) with rigorous quality control. Contamination severity was evaluated using geo-accumulation index (I_{geo}), pollution load index (PLI), and enrichment factor analysis, referenced against unimpacted control soils. A distinct contamination gradient emerged across drainage sites. Soils treated with Jopling Road effluent exhibited the highest multi-metal enrichment, reflecting intense industrial and vehicular inputs. In contrast, Hanuman Setu irrigation resulted in the lowest metal burden, indicative of diluted influent and minimal upstream pollution. China Bazar and Nishat Ganj displayed intermediate contamination, consistent with mixed domestic and light industrial sources. These findings reveal drain-specific pollution legacies that disrupt soil ionic balance, induce oxidative stress in plants, and elevate food chain risks. Pre-treatment of effluents, phytoremediation, and biochar application are recommended to mitigate metal mobility and restore agroecological function.

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Abstract No. 170

**THE ROLE OF MILLETS IN NUTRITION AND
ENVIRONMENTAL RESILIENCE**

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ABSTRACT

Millets encompassing species such as pearl, finger, foxtail, and little millet are emerging as vital components in advancing both nutritional security and environmental resilience. As climate-resilient crops, millets thrive in arid and semi-arid regions, requiring significantly less water and agricultural inputs compared to major cereals like rice and wheat. Their hardy root systems and short growing cycles enable them to withstand drought, high temperatures, and poor soil fertility, making them reliable crops in the face of increasing climate variability. This resilience reduces farmers' vulnerability to crop failure and supports sustainable agricultural practices by promoting biodiversity, minimizing soil degradation, and decreasing dependence on chemical fertilizers. Nutritionally, millets offer a rich profile that positions them as superior alternatives to many staple cereals. They are abundant in dietary fiber, essential amino acids, minerals such as iron, calcium, magnesium, and zinc, as well as bioactive compounds with antioxidant properties. Their low glycemic index makes them particularly beneficial for managing diabetes and metabolic disorders, while their naturally gluten-free composition expands dietary accessibility for individuals with celiac disease or gluten intolerance. Integrating millets into daily diets can thus help combat micronutrient deficiencies prevalent in many developing regions. Furthermore, the resurgence of interest in millet-based value chains contributes to rural livelihoods and food system diversification. With appropriate policy support, improved processing technologies, and market incentives, millets can play a significant role in ensuring sustainable food systems. Their adaptability for both traditional foods and modern processed products increase consumer acceptance and market potential. Overall, millets stand at the nexus of nutrition, sustainability, and climate adaptation, offering a multifaceted solution to current and future global food security challenges.

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Abstract No. 171

**SCREENING OF NATIVE *TRICHODERMA* SPECIES FROM
JANJGIR-CHAMPA DISTRICT FOR THEIR BIOFERTILIZER
POTENTIAL IN PADDY CULTIVATION**

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ABSTRACT

Sustainable rice cultivation requires eco-friendly alternatives to chemical fertilizers and fungicides. The present study aims to screen native *Trichoderma* species from the rhizosphere soil of paddy fields in Janjgir-Champa district, Chhattisgarh, for their potential application as biofertilizers and biochemical agents. Soil sample was collected from different paddy growing regions of the district and processed through serial dilution and plating on selective *Trichoderma* specific media. A total of 5 morphologically distinct *Trichoderma* isolates were obtained and characterized based on cultural, microscopic, and molecular features. These isolates were screened for plant growth promoting activities such as phosphate solubilization, indole-3-acetic-acid (IAA) production, and siderophore secretion, along with antagonistic activities against major paddy pathogen like *Rhizoctonia solani* and *Fusarium oxysporum*. Several isolates exhibited strong antagonistic effects and notable growth-promoting properties. Among them, isolates T5 showed maximum phosphate solubilization efficiency and IAA production. In preliminary greenhouse trials, inoculation with these strains significantly enhanced paddy seed germination, root and shoot length, and overall plant vigor compared to the uninoculated control. The results suggest that native *Trichoderma* strains of Janjgir-Champa district possess dual potential as biofertilizers and biocontrol agents, making the promising candidates for integration into sustainable rice production systems. Further studies on molecular identification, field evaluation, and formulation development are underway to explore their large-scale applicability.

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Abstract No. 172

**EDUCATIONAL DETERMINANTS OF CLIMATE-RESPONSIVE
BEHAVIOR: A STUDY ON ATTITUDE, AWARENESS AND
LEARNING STYLES OF HIGHER SECONDARY STUDENT**

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ABSTRACT

The urgency of global climate change highlights the importance of understanding the student-related factors that shape mitigation-oriented behavior. This study conducts a comparative analysis of three major student variables educational attitude, environmental awareness, and learning styles to identify their influence on climate change mitigation behavior among higher secondary learners. Employing a descriptive survey methodology, data was gathered using standardized instruments and examined through relevant statistical techniques. Results indicate significant differences in mitigation behavior across groups with varying levels of educational attitude and environmental awareness. Students who displayed stronger environmental awareness and positive academic attitudes showed a greater tendency toward adopting sustainable, climate-friendly practices. Learning style also emerged as a contributing factor, with inquiry-based and participatory learners demonstrating higher environmental sensitivity and ethical responsibility. The study highlights the necessity of incorporating climate education, experiential learning, and ethics-based teaching strategies in school curricula to reinforce climate change mitigation behavior and contribute to long-term human well-being.

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Abstract No. 173

**ADVANCEMENTS IN PHARMACEUTICAL
NANOFORMULATION: BIODEGRADABLE POLYMERS
FOR ENHANCED DRUG DELIVERY AND
ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Nanoformulation refers to the utilization of nanotechnology in pharmaceutical sciences to develop drug delivery systems at the nanoscale, namely between 1 to 1000 nanometers which improve the solubility, stability, and bioavailability of medicinal agents. These sophisticated formulations, comprising nanoparticles, dendrimers, liposomes and nanoemulsions provide accurate targeted distribution with regulated release profiles, thereby minimizing required dosage and potential toxicity. The creation of nanoformulations depends on interdisciplinary principles from material science, chemistry, and engineering, employing methods such as nanoprecipitation, emulsification, and high-pressure homogenization to attain ideal particle size and drug release properties. A pivotal element of nanoformulations is the employment of biodegradable polymers such as PLGA, PLA, and PCL, which decompose into non-toxic byproducts, so averting buildup in the body and mitigating long-term toxicity and environmental risks. The diminutive dimensions characteristic of nanoformulations reduces material volume, so lessening environmental impact, while simultaneously augmenting drug solubility and permeability for enhanced therapeutic effectiveness. Biodegradable polymer-based nanoformulations reduce plastic waste and pollution yet, the possible ecological concerns associated with nanoparticle discharge into soil and water persist as a worry. Nanotechnology's application is now beyond drug delivery, presenting innovative solutions for climate change via sustainable material design, enhanced energy systems, and pollution mitigation. Nanoformulations plays a significant progression in medication delivery, merging therapeutic accuracy with environmental sustainability yet, further research is essential to comprehensively comprehend and judiciously address their ecological ramifications. This technology perpetuates innovation in pharmaceutical development and extends to broader applications that tackle global health and environmental issues.

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Abstract No. 174

**MHD-BASED MODELING OF PERISTALTIC BLOOD FLOW
WITH GOLD NANOPARTICLES FOR CLIMATE-RESPONSIVE
CANCER THERAPY**

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ABSTRACT

As environmental degradation accelerates and health vulnerabilities grow, the need for sustainable and ethically grounded medical solutions has never been more urgent. This study responds to that call by presenting a nanomedical framework for targeted cancer therapy, modeled through peristaltic blood flow enriched with gold nanoparticles (GNPs). These nanoparticles, known for their quantum-scale photothermal properties, enhance localized treatment while reducing systemic toxicity. The interaction between magnetic fields and physiological fluid motion is captured using magnetohydrodynamic (MHD) modeling, and MATLAB simulations are employed to explore velocity profiles, thermal gradients, and nanoparticle dispersion. While technically rooted in advanced fluid dynamics and biomedical engineering, the research is driven by a broader societal goal: to develop climate-adaptive, low-impact healthcare strategies that align with environmental responsibility. By promoting precision drug delivery and minimizing ecological strain, this work contributes to the evolution of resilient healthcare systems that prioritize both human wellbeing and planetary health. It offers a timely and meaningful step toward integrating scientific innovation with ethical and environmental consciousness in the face of global health and climate challenges.

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Abstract No. 175

**AN INTEGRATED ANALYSIS OF CLOUD COMPUTING'S
ENVIRONMENTAL SUSTAINABILITY, ECONOMIC
COMPETITIVENESS AND SOCIAL WELL-BEING
TOWARDS SUSTAINABLE DEVELOPMENT**

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ABSTRACT

Cloud computing has swiftly become an essential technology in today's digital world, and its rising influence offers meaningful opportunities to support sustainable development. This paper delivers an integrated analysis of how cloud computing contributes to environmental sustainability, economic competitiveness and social well-being. On the environmental side, the study argues how cloud-based systems help decrease energy consumption, reduce carbon emissions and promote the use of more proficient and eco-friendly data centers. From an economic perspective, the paper highlights how cloud services minimise infrastructure costs, improve scalability, encourage innovation and strengthen the competitiveness of businesses and organizations. The social dimension focuses on the role of cloud technology in improving digital access, supporting remote collaboration, improving public service delivery and boosting sectors such as education and healthcare. Together, these insights indicate that cloud computing is an important driver of sustainable development, helping balance environmental responsibility with economic growth and societal development. The paper concludes by emphasizing the importance of supportive policies, continuous technological advancements and responsible cloud adoption to fully realize these long-term advantages.

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6 & 7 December, 2025

Abstract No. 176

**GENETIC IMPROVEMENT IN PRISHNIPARNI (*URARIA PICTA*
(JACQ.) DESV. EX DC.) THROUGH GAMMA IRRADIATION:
DEVELOPING HIGH-YIELDING AND
RHOIFOLIN-ENRICHED MUTANTS**

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ABSTRACT

Uraria picta (Desv.), a threatened medicinal shrub of the Fabaceae family is a vital ingredient in the Ayurvedic formulation Dashmula, composed of roots from ten medicinal plants. This species possesses significant therapeutic properties, including antiseptic and anti-microbial effects, and is used to treat fatigue, oral sores, and gynecological disorders. The active compound rhoifolin (Apigenin-7-o-neohesperidoside) is crucial for its efficacy. To address its limited genetic variability and support sustainable cultivation, this study employed gamma irradiation-induced mutagenesis on the elite variety CIM-Rhoi Gold (accession UP-50), known for its high herb yield and rhoifolin content. The lethal dose (LD₅₀) was determined to be 725 Gy based on germination rate and seedling vigor indices. Morphological evaluation of 75 M₂ mutants revealed substantial variability across 19 agronomic traits, with mutants such as C50 and C94 exhibiting improved biomass yield. Genetic divergence analysis grouped mutants into nine clusters, with Cluster II showing superior agronomic performance. Rhoifolin, a key bioactive flavonoid, was quantified by HPLC and found to be significantly elevated in several mutants (e.g., C97: 1.81%) compared to the control (0.86%), while remaining nearly absent in roots. Principal component and cluster analyses confirmed significant genetic and chemotypic diversity among the mutants. The findings highlight the potential of mutation breeding for developing high-yielding, metabolite-rich genotype of *U. picta*, paving the way for its conservation, commercial cultivation, and enhanced pharmacological use.

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Abstract No. 177

**DIVERSITY AND CONSERVATION STATUS OF SNAKES WITH
SPECIAL REFERENCE TO PUBLIC PERCEPTION IN
LUCKNOW, UTTAR PRADESH**

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ABSTRACT

Snakes play an essential ecological role in regulating rodent population and maintaining trophic balance, yet negative perceptions and widespread myths continue to threaten their survival. This study focuses on the diversity of snake species across major habitat types in Lucknow, Uttar Pradesh, and assesses public awareness, fear and misconceptions related to snakes. Field surveys conducted across different habitats- forest, water bodies, agricultural land and human settlements, recorded 12 snake species belonging to 6 families, with the highest abundance observed in human-dominated areas and the greatest species richness in forest habitats. Diversity indices indicated moderate overall diversity (Shannon $H' = 2.27$; Simpson $1-D = 0.88$), while Colubridae emerged as the most dominant family. To evaluate community perception, an online questionnaire survey was conducted, along with an offline fear and myth-based questionnaire. Results showed that 81% of respondents correctly recognized snake's ecological role, yet widespread fear persists. Misconceptions remain common, 74% believed all snakes are venomous, 65% believed snakes dance to flute music and 70% believed snakes take revenge. These myths contribute to unnecessary killing of snakes. The study highlights the need for targeted conservation through education, focusing on debunking myths, reducing fear and promoting coexistence. The findings emphasize that effective snake conservation requires not just ecological study but also transformation of social attitudes.

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Abstract No. 178

**IMPACT OF IMPROVED WATER QUALITY IN THE RIVER
GANGA ON THE PREVALENCE OF MONOGENEAN
PARASITES: ECOLOGICAL IMPLICATIONS**

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ABSTRACT

Monogeneans are the ectoparasitic flatworms which mainly infect skin and gills of fishes, are also good bio indicators of aquatic ecosystem health. Anthropogenic pollution affects water quality and aquatic biodiversity in the Ganga river, an important ecosystem in India. Fish hosts are infected by Monogenean Parasites which are frequent in stressful situations and intensify ecological imbalance. With the focus on ecological dynamics, this study examines the possible impacts of the Ganga's restoration efforts on Monogenean prevalence. Clean water (low organic load, high dissolved oxygen) is hypothesized to decrease parasite abundance by improving fish immunity. If fish immunity increased they become less susceptible to parasitic infection mainly Monogenean infection. Host resilience is also indirectly benefited by self- purifying bacteriophage (1,100+ species) present in Ganga river which may further suppress pathogenic microbes. The persistent pollution hotspots (e.g. urban centres) could support parasite reservoirs. This research evaluate correlations between water quality parameters (BOD, turbidity, pH) and Monogenean infection rates in important fish species (*L. rohita*, *C. catla*) using parasitological surveys. Introductory findings suggest that lessen pollution lowers infection severity, though seasonal variability (Monsoon, Industrial discharge) moderates this trend. To alleviate parasitic threats results highlight the need for holistic river management.

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Abstract No. 179

**ENVIRONMENTAL ETHICS, BUSINESS AND HUMAN
RESPONSIBILITY: WITH SPECIAL REFERENCE
TO PAPER INDUSTRY IN UTTAR PRADESH**

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ABSTRACT

In Uttar Pradesh paper industry has played a vital role in improving the economy, due to its growth the major concerns is about their social responsibility, sustainability and corporate responsibility. This study analysed how the paper mill in Uttar Pradesh deals with business movement, morality and social responsibility. A survey of about 32 paper mills found that 85% of them have an environmental policy. This is an encouraging signal that they are becoming more environmentally responsible. Around 58% of the mill does regular audits to maintain environmental policy, and 72% have already started using technical-know-how and latest technologies that save energy. Also 65% have already put in place ways to recycling method to recycle waste to reduce impact on environmental problem. The study also looked at programs that promote business and social responsibility. It discovered that 72% of the mills possess a corporate social responsibility. Major focus on social outreach and engagement of all stakeholder involved. However, 35% of the paper mills are facing environmental or community controversies which requires improvement plan for environmental issue. The survey assessed social responsibility and alertness regarding environmental issues. It found that 85% of the mills is educating and implementing latest technical-know-how and providing employee training on environmental issues and sustainability, but varies awareness promotion among different stakeholders. The most important challenges faced by the mills are lack of regulatory hurdles (18%), lack of awareness (32%), lack of technical resources (60%). To maintain and promote community responsibility and environmental sustainability, paper mills in Uttar Pradesh build up their environmental audit processes, embrace pollution control technical equipment system and latest technologies, and intensify engagement of stakeholders and social outreach programs. By focusing on these areas, the paper industry can ensure economic growth while protecting and controlling their environment.

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Abstract No. 180

EFFECT OF GREEN HOUSE GASES ON CLIMATE CHANGE

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ABSTRACT

The greenhouse effect is a phenomenon occurring in the Earth's atmosphere under the influence of solar radiation. The sun emits energy, including visible light, ultraviolet rays, and infrared radiation, that penetrates the atmosphere mainly composed of nitrogen, oxygen, water vapour, and various gases, including greenhouse gases. Interaction with infrared radiation plays a crucial role in creating the greenhouse effect. When the energy leaving is less than the energy entering, Earth warms until a new balance is established. Greenhouse gases emitted by human activities alter Earth's energy balance and thus its climate. Humans also affect climate by changing the nature of the land surfaces (for example by clearing forests for farming) and through the emission of pollutants that affect the amount and type of particles in the atmosphere. Human activities have added greenhouse gases to the atmosphere. The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased significantly since the Industrial Revolution began. Based just on the physics of the amount of energy that CO₂ absorbs and emits, a doubling of atmospheric CO₂ concentration from pre-industrial levels (up to about 560 ppm) would by itself cause a global average temperature increase of about 1 °C. In the overall climate system, however, things are more complex; warming leads to further effects that either amplify or diminish the initial warming. Water vapour is a potent greenhouse gas, thus causing more warming; its short lifetime in the atmosphere keeps its increase largely in step with warming. Higher temperatures in the polar regions melt sea ice and reduce seasonal snow cover, exposing a darker ocean and land surface that can absorb more heat, causing further warming. Another important but uncertain feedback concerns changes in clouds. The latest assessment of the science indicates that the overall net global effect is likely to be to amplify warming.

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Abstract No. 181

**IN - SILICO IDENTIFICATION AND CHARACTERIZATION OF
MARINE FUNGAL ENZYMES WITH PLASTIC
BIODEGRADATION POTENTIAL**

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ABSTRACT

Plastic pollution in marine environments has emerged as a persistent global challenge, creating urgent demand for sustainable biodegradation strategies. Marine fungi represent a promising yet underexplored source of enzymes capable of breaking down synthetic polymers. The present study focuses on the in-silico identification and characterization of potential plastic-degrading enzymes derived from a selected marine fungal species. Genomic and proteomic datasets were screened computationally to identify enzyme candidates associated with polyester hydrolysis, oxidative cleavage, and related catabolic pathways. Functional predictions were performed using domain analysis, conserved motif detection, and structure-based modelling. Molecular docking was applied to examine enzyme-substrate interactions with common plastic polymers, enabling assessment of catalytic potential and binding affinity. Phylogenetic analysis further clarified evolutionary relationships with previously reported plastic-degrading enzymes. Collectively, the study establishes a computational framework for predicting efficient biodegradation candidates and provides a focused list of fungal enzymes with strong theoretical potential for plastic breakdown. These insights can guide future laboratory validation and support development of eco-friendly biotechnological applications.

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Abstract No. 182

**ECO-FRIENDLY FABRICATION OF METALLIC
NANOPARTICLES FROM MORINGA OLEIFERA**

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ABSTRACT

The synthesis of nanoparticles using medicinal plant extracts has emerged as an eco-friendly and sustainable alternative to conventional chemical and physical methods. Plant-based nanoparticles (NPs) utilize various phytochemicals such as phenolics, flavonoids, alkaloids, terpenoids, and proteins that act as natural reducing, stabilizing, and capping agents. This green synthesis approach eliminates the use of toxic reagents and high energy inputs, making it cost-effective and environmentally benign. In the present study silver nanoparticles (AgNPs) have been synthesized utilizing leaf extract of *Moringa oleifera* by the reduction of silver nitrate solution. The green synthesized AgNPs were partially characterized by UV-visible spectroscopy with maximum absorbance (λ_{max}) at 424 nm. The synthesized AgNPs showed significant antioxidant potential assessed by 2, 2-diphenyl-1-picryl hydrazyl (DPPH) radical scavenging assay. It also has antibacterial activity against *E. coli* bacterial strain in present study. Our results explain that *Moringa oleifera* leaf extract have potential as bio-reducing agent for synthesis of AgNPs, which can be exploited as anti-oxidant and antibacterial agent. This depicts an effective way for utilizing bioactive resources in restoration of medicinal properties of this plant *Moringa oleifera* with high efficacy.

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Abstract No. 183

**ROLE OF WOMEN AND TRIBES IN SOCIAL AND
ENVIRONMENT SUSTAINABILITY**

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ABSTRACT

Women and tribal communities play a crucial and often under recognized role in advancing social and environmental sustainability. Rooted in traditional knowledge systems and close relationships with nature, their contributions encompass the resource conservation, sustainable livelihoods, and community resilience. Women, particularly in rural and indigenous settings, are primary custodians of natural resources such as water, forests, and soil. Their active participation in decision-making fosters inclusive development and equitable resource management. Similarly, indigenous groups preserve rich biodiversity through sustainable practices like shifting cultivation, traditional seed preservation, and forest management based on ecological balance rather than exploitation. Their cultural values emphasize coexistence with the nature, collective welfare, and respect for the environment and the principles essential for achieving long-term sustainability goals. However, both women and tribes often face marginalization, lack of representation, and socio-economic challenges in the present scenario that limit their potential impact. Recognizing and empowering these groups through education, policy inclusion, and community-led initiatives is vital for building sustainable societies. Amalgamating indigenous knowledge with modern sustainability frameworks can lead to innovative solutions for climate adaptation, biodiversity conservation, and social equity. This paper highlights the interconnected role of women and tribal communities in fostering social cohesion, environmental stewardship, and sustainable development, emphasizing the need for the inclusive strategies that value their traditional wisdom and active participation in contemporary sustainability efforts.

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Abstract No. 184

**MICROBIAL WORLD IN THE MODERN ERA: EMERGING
ROLES, RISKS, AND SCIENTIFIC BREAKTHROUGHS**

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ABSTRACT

The significance of microbes in maintaining Earth's environmental balance has become increasingly evident in recent scientific studies. Microbes play essential roles from sustaining ecological balance to supporting human health, agriculture, and industry. They are now being explored as valuable tools in climate change solutions, such as methane-consuming bacteria and soil microbes that enhance carbon storage, alongside their importance in waste degradation and environmental restoration. The microbial world also presents significant challenges. According to the WHO, antimicrobial resistance is linked to nearly 4.95 million deaths globally each year. Emerging and re-emerging infectious diseases like COVID-19, Ebola, Zika, and MERS continue to highlight the threat of zoonotic outbreaks. The progress in the field of microbiology has been astounding. Technologies such as metagenomics, CRISPR-Cas genome editing, and human microbiome research have opened new doors in medicine, biotechnology, and ecological studies. Concepts like the pan-microbiome and innovations in next-generation prebiotics and probiotics are reshaping our approach to health and nutrition. Additionally, the integration of Artificial Intelligence and Machine Learning has enabled deeper analysis of large microbial datasets, aiding in the discovery of new organisms and their potential applications. Microbes have become a central focus of modern scientific research, and their study is expected to play a crucial role in shaping the future of human health, agriculture, and environmental sustainability.

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Abstract No. 185

**PATHOGENIC FUNGI FROM MOTIPUR FOREST
RANGE BAHRAICH U.P. INDIA**

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ABSTRACT

Motipur Forest is a part of the Kataraniaghat Wildlife Sanctuary in the Bahraich district of Uttar Pradesh, India. It is one of the sanctuary's main areas, featuring a variety of wildlife and ecosystems, and is a key location for safaris within the sanctuary. The Motipur forest is about 60 km from the Bahraich headquarters and is known for its diverse flora and fauna, including tigers, elephants, and various reptiles like mugger crocodiles and gharials. The leaves provide a very suitable habitat for the growth and development of fungal pathogen by providing ample surface area and nutrient supply. Such leaf inhabiting fungi are known as pathogenic fungi and the invaded area of the leaf appears as leaf spot. The weed and forest plants serve as reservoir of leaf spot pathogen. India is the one of the twelve mega biodiversity countries of the world, has two of the worlds eighteen biodiversity hot spots located in the Western ghats and in the Eastern Himalayas. In north the Himalayas rise as a virtual wall beyond the snow line. Above the alluvial plain lies the Tarai strip, a seasonally marshy zone of sand and clay soils. Motipur Forest Bahraich belongs to Northern Tarai Region. Keeping this in mind the authors surveyed with 20 Angiospermic host plants representing 10 genera and 10 families being parasitized by 25 fungal species representing 20 genera.

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Abstract No. 186

**LEAF INHABITING FUNGI FROM SUHELWA WILDLIFE
SANCTUARY, BALRAMPUR UTTAR PRADESH INDIA**

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Department of Botany
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ABSTRACT

The leaves provide a very suitable habitat for the growth and development of fungal pathogen by providing ample surface area and nutrient supply. Such fungi are known as leaf inhabiting fungi and the invaded area of the leaf appears as leaf spot. The weed and forest plants serve as reservoir of leaf spot pathogen. India is the one of the twelve mega biodiversity countries of the world, has two of the worlds eighteen biodiversity hot spots located in the Western ghats and in the Eastern Himalayas. In north the Himalayas rise as a virtual wall beyond the snow line. Above the alluvial plain lies the Tarai strip, a seasonally marshy zone of sand and clay soils. Suhelwa Wildlife Sanctuary located in Shravasti, Balrampur and Gonda districts of Uttar Pradesh, belongs to North Tarai Region Suhelwa was declared a Wildlife Sanctuary in 1988 occupying an area of 452 sq km, the sanctuary is covered with Sal, Sheesham, Khair, Sagaun (Teak), Asna, Jamun, Haldu, Phaldu, Dhamina, Jhingan and Bahera trees. Sohewla Wild Life Division is situated on the Indo-Nepal International Border. Sohewla Wild Life Sanctuary is placed in between 27°30'1" N. to 27°55'42" N. latitude & 81°55'36" E. to 82°48'33" E. Longitude. It is full of natural resources. It consists of dense forests with enormous wild life. Forms of natural scenery and beauty of the sanctuary has its unique place in Uttar Pradesh. Adjacent to the Sanctuary area there are Shivalik Ranges of Himalaya. Above that there are dense forest, pastures in the forest areas and different water channels, related to these. In these forests the topography is uneven. There are ups and downs at place to place. Keeping this in mind the authors surveyed the Sanctuary with fifty-five Angiospermic host plants representing forty-five genera and thirty-five families being parasitized by forty-five fungal species representing thirty-five fungal genera.

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Abstract No. 187

**ALLERGENIC FUNGAL SPORES AND POLLEN
GRAINS TRAPPED FROM AIR IN GONDA CITY BY
ROTOROD AIR SAMPLER**

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ABSTRACT

Airborne biological particles such as fungal spores and pollen grains are major contributors to allergenic respiratory diseases worldwide. This study investigates the diversity, concentration and seasonal variation of allergenic fungal spores and pollen present in ambient air. Using Rotorod air sampler and microscopic identification, samples were collected from different places of Gonda city from January 2024 to December 2024 to quantify dominant aeroallergens and assess their temporal distribution. The finding reveals that among fungal spores - particularly *Cladosporium*, *Aspergillus*, *Curvularia*, *Epicoccum*, *Fusarium*, *Mucor*, *Penicillium*, *Trichoderma* and *Candida* occurred in higher concentration where as among pollen grains, *Cassia*, *Cynodon*, *Datura*, *Amaranthus*, *Ageratum*, *Euphorbia* and *Parthenium* were found in higher concentration throughout the year, with peak levels observed during warm and humid months. The study highlights clear correlations between meteorological factors and aeroallergen prevalence, underscoring the influence of temperature, humidity and wind velocity on airborne dispersal. These results provide valuable baseline data for allergy forecasting, public health planning and environmental monitoring aimed at reducing exposure risks for sensitive individuals.

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Abstract No. 189

**MUSIC THERAPY AS A PROTECTIVE INTERVENTION
AGAINST CHRONIC STRESS-INDUCED
HEPATIC DYSFUNCTION**

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ABSTRACT

Depression is a complex neuropsychiatric disorder that also affects peripheral organ systems through chronic stress-mediated biochemical and oxidative alterations. The Chronic Unpredictable Mild Stress (CUMS) model is widely employed to reproduce depression-like symptoms in rodents. Conventional antidepressants such as fluoxetine are effective but may exert hepatic stress during long-term administration. In contrast, music therapy has emerged as a non-pharmacological intervention with demonstrated anxiolytic and neuroprotective properties. This study aimed to evaluate the protective effects of music therapy on liver function in CUMS-induced depressed rats and compare outcomes with fluoxetine treatment. Behavioural assays, including the Open Field Test (OFT) and Elevated Plus Maze (EPM), were performed to assess locomotion and anxiety-like behaviour. Biochemical parameters were analysed to evaluate hepatic integrity, while histological examination provided structural insights. Results indicated significant behavioural improvement in both fluoxetine- and music-treated groups; however, fluoxetine shows elevations in hepatic biomarkers, coupled with minor structural alterations. In contrast, music therapy preserved near-normal biochemical and histological profiles, indicating no organ burden. Overall, findings support music therapy as an effective and organ-safe adjunct or alternative therapeutic modality for stress-induced depression. Its non-invasive nature and minimal toxicity profile highlight the potential for broader application in integrative mental-health management.

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Abstract No. 190

**ROLE OF GREEN-SYNTHEZIZED COPPER OXIDE
NANOPARTICLES AGAINST DROUGHT TOLERANCE
IN TOMATO PLANTS**

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ABSTRACT

Among various abiotic stresses, drought stress is very common. Due to scarcity of water new risk for compromising global food security may happen in future. To mitigate these challenges, green-synthesized nanoparticles (NPs) derived from plant extracts have recently emerged as an innovative tool for enhancing crop resilience to abiotic stresses such as drought. Green nanoparticle enables eco-friendly production with diverse uses. Here, we investigated the potential of copper oxide (CuO) nanoparticles synthesized from plant extracts to alleviate drought stress in tomato plants (*Solanum lycopersicum* L.). The plant based CuO NPs were characterized via UV-Vis spectrophotometry and SEM. Foliar applications of these NPs at various concentrations (0, 3, 6, and 9 mg/L) were tested on tomato seedlings under normal and drought-induced conditions controls: (water treated) and drought stress control. Morphological and biochemical assessments showed that the tomato plants supplied with 6 mg/L plant-based CuO NPs were found to be the most effective under drought stress, significantly reducing leaf yellowing and increasing shoot length, root length, total dry biomass, total chlorophyll content increased and the increased reproductive yield at ($p < 0.05$) compared to the drought stress control. These findings highlighted the potential of the use of plant-synthesized CuO nanoparticles as a sustainable, eco-friendly strategy to mitigate drought stress in economic crops such as tomatoes. This new green approach offers a promising solution for bolstering food security in the face of climate change and water scarcity challenges for the upcoming future.

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Abstract No. 191

**SEASONAL AVAILABILITY OF A FEW EDIBLE FISH
SPECIES IN RIVER TAMSA AT AYODHYA DISTRICT
OF UTTAR PRADESH INDIA**

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Durgesh Kumar Verma and Arpana Trivedi**

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ABSTRACT

The present study investigates the seasonal availability and diversity of selected edible fish species in the river Tamsa within the Ayodhya district of Uttar Pradesh India. The work was conducted two year period, encompassing pre- monsoon, monsoon and post- monsoon season. Fish samples were collected monthly from different sites of the river using standardized cast nets and gill nets with the help of local fishermen. It was recorded that there are notable seasonal variations in species abundance and composition. Major edible fish species observed include *Catla catla*, *Labio rohita*, *Cirrhinus mrigala*, *Wollago attu*, *Heteropneustus fossilis*, *Mystus seenghala*, *M. vittatus*, *M. tengra*, *Clarius batrachus*, *Puntius*, *Notopaterus notopaterus*, *Anabas*, *Oxygastur*, *Xenentodon cancila*. Peak availability was recorded during monsoon season, coinciding with increased water level dissolved oxygen content and enhanced planktons productivity in contrast decline in species abundance was noted during the pre -monsoon periods due to reduced water volume and elevated temperature.

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Abstract No. 192

**LASER REMOTE SENSING TECHNOLOGY AND
SUSTAINABLE AGRICULTURE**

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ABSTRACT

In essence, remote sensing is vital in contemporary agriculture as it facilitates precision farming. This practice allows for more efficient use of resources like water and fertilizers, which benefits the environment and increases food production. By collecting data from satellites, drones, and ground sensors, farmers can make informed decisions based on accurate information. Remote sensing helps determine the exact amounts of water, fertilizer, and pesticides needed in different sections of a field. Consequently, this approach reduces resource waste, minimizes water runoff pollution, and lowers expenses for these inputs. Devices that analyze various light spectrums offer critical insights into plant health, identify nutrient deficiencies such as nitrogen, and assess soil moisture levels. This capability enables early detection of problems or diseases, allowing for prompt intervention before they escalate. Throughout the growing season, monitoring crop health and growth with remote sensing data aids in predicting harvest yields. This information is crucial for organizing all aspects of crop management, from harvesting to storage and sale, ensuring a stable income for farmers. Remote sensing also plays a role in tracking climate changes, such as droughts or land degradation, which helps in risk assessment. The data gathered supports farmers and governments in formulating strategies to adapt to these changes and adjust farming practices accordingly. The extensive data collected through remote sensing is processed using advanced software, including AI and machine learning. Instead of applying a blanket treatment across an entire field, remote sensing allows for a precise approach to managing specific areas of land, which is essential for achieving the United Nations' goal of eradicating hunger. These systems provide farmers with practical recommendations, such as the best times for planting and strategies for pest control, thereby improving the efficiency and simplicity of their operations.

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Abstract No. 193

**EVALUATION OF TOXICITY BY ACTIVE COMPOUND
PRESENT IN LATEX EXTRACT OF *CODIAEUM VARIEGATUM*
AND *ALSTONIA SCHOLARIS* AGAINST TARGET
FISH *MYSTUS MYSTUS***

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ABSTRACT

Water is essential for the biosphere on our planet to function healthily life for every organism and mechanical present. The increasing use of plant-derived ichthyotoxins in aquatic pest management highlights the need for scientific evaluation of their safety and efficacy. This study investigates the toxicity of active compounds present in the latex methanol extracts of *Codiaeum variegatum* and *Alstonia scholaris* against a selected target fish species. Latex was collected from mature plants, and active constituents were isolated using standard phytochemical extraction and fractionation techniques. Acute toxicity assays were conducted following OECD guidelines to determine lethal concentration values (LC_{50}) and sub-lethal effects. Behavioral responses, physiological alterations, and mortality rates of the test fish were recorded across different exposure periods. The results showed that latex extracts from both species possess significant toxicity, with *Codiaeum variegatum* demonstrating comparatively higher potency as compare to *Alstonia scholaris* against fish *Mystus mystus*. The LC_{50} values of the methanol extract of *Codiaeum variegatum* dropped from 27.40 mg/l (24h) > 18.69 mg/l (48h) > 12.34 mg/l (72h) > 8.07 mg/l (96h) and the LC_{50} value of methanol extract of *Alstonia scholaris* 39.99 mg/l (24h) > 29.03 mg/l (48h) > 20.55 mg/l (72h) > 15.87 mg/l (96h). These findings suggest that latex-derived compounds from these plants may serve as effective natural piscicides, though their ecological implications warrant further investigation. Overall, the study provides foundational data for the potential application of botanical toxins in sustainable fish population management.

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Abstract No. 194

**WOUND HEALING ACTIVITY OF LEAF OF
NYCTANTHES ARBORTRISITIS (LINN.)**

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ABSTRACT

The leaves of *Nyctanthesarbor-trisitis* (Linn.) are used in Traditional System of Medicine for the treatment of stomachic, carminative, intestinal astringent, expectorant, biliousness piles, hair tonic and wound healing. Extracts from the dried leaves of *Nyctanthes arbortritis* (Linn.) were prepared using methanol as solvent in order to investigate the wound healing activity in vivo. Circular excision and linear incision wounds were created on rats. Three groups of rats were prepared viz. control, standard and treated with extract. Its methanol extract was tested for wound healing activity. It was noticed that the wounds were monitored and the area of wound was measured on 4, 8, 12, 16 post-wounding days and the mean % wound closure were reported. Epithelization period was calculated as the number of days required for falling of the dead tissue remnants without any residual raw wound. Wound healing rate was measured using formula. Significant wound healing activity was observed for the ointment prepared with methanol extract at 2% (w/w) concentration and with aqueous extract at 2% (w/w) concentration. The experimental data revealed that the methanolic extract of *Nyctanthes arbor-trisitis* (Linn.) leaves displayed remarkable wound healing activity.

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Abstract No. 195

**ASSESSMENT OF AIR POLLUTION TRENDS ON PRE,
DURING AND POST-DIWALI IN LUCKNOW CITY AND THEIR
IMPACT ON HUMAN HEALTH AND PLANTS**

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ABSTRACT

As we all know that Air Pollution is becoming a major concern globally and posing detrimental impact on human health and ecosystem. Recent air quality assessments in Lucknow reveal that PM_{2.5} and PM₁₀ concentrations have persistently breached national and global standards. Diwali is one of the major festivals celebrated all over India. Firecracker emissions during Diwali cause significant air quality deterioration in Lucknow, a pattern consistently observed during the festival season. The evidence points to an urgent necessity for enhanced air quality regulation and broader public education measures aimed at reducing harmful exposures and safeguarding the well-being of Lucknow's population. According to World Health Organization, 99% of world's population lives in those areas which do not met the WHO air quality standard. In 2019, WHO consider air pollution as the greatest environmental health risk and estimated that 7 million premature deaths annually. According to World Air Quality Report 2024, Lucknow ranks 9th in top 20 most polluted cities in world, the annual average concentration of PM_{2.5} was 27 microgram per cubic meter which is 1.8 times higher than WHO recommended annual guideline of 15 microgram per cubic meter. (AQI 2024). The current study suggest that PM 2.5 and PM 10 was observed highest on Diwali day 2025, due to over bursting of firecrackers compare to previous year Diwali.

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Abstract No. 196

**SUSTAINABLE IMPROVEMENT OF PEPPERMINT
CULTIVATION USING *BACILLUS* SPP. PLANT
GROWTH-PROMOTING RHIZOBACTERIA**

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ABSTRACT

Peppermint (*Mentha piperita* L.) is a widely cultivated medicinal and aromatic plant valued for its essential oil (EO), with its global market expected to grow from USD 230.3 million in 2024 to USD 444.6 million by 2034. Despite its economic potential, peppermint cultivation remains less preferred than menthol mint (*Mentha arvensis* L.) due to comparatively lower herb and oil yields, resulting in heavy dependence on synthetic fertilizers. This overuse not only increases nitrous oxide (N₂O) emissions but also raises safety concerns for plant-derived products. This study proposed that plant growth-promoting rhizobacteria (PGPR) could enhance peppermint productivity while reducing reliance on chemical inputs. Eight *Bacillus*-based PGPR strains, *B. tequilensis* VS04 (T1), *B. subtilis* VS06 (T2), *Bacterium* sp. VS05 (T3), *B. thuringiensis* VS07 (T4), *B. cereus* VS09 (T5), *B. safensis* VS08 (T6), *B. pumilus* VS02 (T7), and *Bacillus* sp. VS03 (T8) were evaluated for growth-promoting effects in two peppermint varieties, CIM-Suras and CIM-Indushree. Surface-sterilized suckers inoculated with individual strains were assessed for morphological, physiological, and biochemical responses. Among all treatments, *B. subtilis* VS06 (T2) produced the most pronounced improvements in plant growth, photosynthetic performance, chlorophyll content, and antioxidant enzyme activities (proline, superoxide dismutase, and catalase), suggesting enhanced oxidative stress tolerance. This study offers the first comparative insight into varietal responses of peppermint to multiple *Bacillus* strains, demonstrating that PGPR-mediated antioxidative regulation can drive improved essential oil productivity. Overall, the findings highlight *Bacillus*-based bioformulations as sustainable and climate-resilient alternatives to synthetic fertilizers for boosting peppermint cultivation efficiency.

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Abstract No. 197

**SPATIAL DISTRIBUTION OF TWO SPECIES OF
FRESHWATER PRAWNS IN THE RIVER TAMSA AT AYODHYA**

**Harnam Singh Lodhi, Durgesh Kumar Verma,
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ABSTRACT

The present research focuses on understanding the distribution and preferred habitats of two freshwater prawn species, *Macrobrachium dayanum* and *Macrobrachium lamarrei*, along the River Tamsa within the Ayodhya district (Uttar Pradesh, India). Systematic sampling was conducted across selected river stretches to examine patterns of abundance, environmental influences, and species co-occurrence. Results show distinct spatial segregation between the two species, influenced primarily by water depth, velocity, substrate composition, and dissolved oxygen levels. The findings highlight the role of microhabitat heterogeneity in maintaining prawn diversity in the river ecosystem and provide baseline data for future management and conservation strategies.

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Abstract No. 198

**TOXICOLOGICAL IMPACTS OF HEAVY METAL-RICH
TANNERY WASTEWATER ON AQUATIC ORGANISMS**

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ABSTRACT

Heavy metals, salts, and hazardous compounds are among the many organic and inorganic pollutants found in the massive amounts of wastewater produced by the leather industry. These effluents drastically change the physicochemical characteristics of water when they are released into aquatic systems, posing major problems for aquaculture. The main physicochemical factors—total suspended solids (TSS), total dissolved solids (TDS), turbidity, pH, alkalinity, hardness, and dissolved oxygen (DO)—that are crucial for fish growth and production. These ecological elements are easily felt by aquatic creatures, influencing fish physiology and growth. Turbidity, TDS, pH, DO, and alkalinity are important markers of water quality for fish health and ecosystem stability; high TDS, excessive turbidity, and pH changes can all have a negative impact on fish development and survival. Adequate dissolved oxygen levels are critical for optimum aquaculture accomplishment. Furthermore, heavy metal bioaccumulation poses extra concerns, affecting fish health as well as human consumers via trophic transfer. To maintain sustainable aquaculture operations, this review emphasizes the critical importance of good tannery effluent management, dependable wastewater treatment technologies, and ongoing environmental monitoring.

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Abstract No. 199

ENVIRONMENTAL ETHICS AND BIOCENTRIC VIEW

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ABSTRACT

Environmental ethics is a field that examines the moral duties humans have toward the natural world. It encourages us to think about how our actions affect the environment and why nature deserves respect and protection. Human well-being, on the other hand, refers to the overall quality of life people experience—physically, mentally, socially, and economically. Both are closely linked because a healthy environment is essential for a healthy and meaningful human life. Understanding Environmental Ethics, Environmental ethics argues that the natural environment is not just a resource for human use; it has value in itself. This perspective urges people to make decisions that protect the environment and ensure sustainability. Anthropocentric View: Where humans are at the center. Nature is seen as important because it supports human life and development. Biocentric View, This perspective believes that all living organisms—whether human or not—deserve moral respect and ethical consideration. Ecocentric or Ecosystem-Centered View. This approach gives value to entire ecosystems, including mountains, rivers, forests, soil, and non-living elements. It promotes living in balance with nature rather than exploiting it. Human Well-Being is Physical health is clean air, nutritious food, safe water and Mental and emotional balance and peaceful surroundings, low stress. Economic security (stable resources and livelihoods) Social and cultural is well-being (community harmony, cultural connections) and Environmental safety as freedom from pollution and natural disaster and a stable and clean environment contributes to each of these aspects. Sustainable Water and Food Resources, Protecting forests, wetlands, and biodiversity ensure reliable access to clean water, fertile soil, and stable food supplies. When humans treat the environment responsibly, they ensure clean air, safe water, stable climates, and sustainable livelihoods. Caring for nature is ultimately a way of caring for ourselves and securing a healthier future for the generations to come.

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Abstract No. 200

**CATALYTIC INNOVATIONS FOR THE BIOMANUFACTURING
OF HIGH-VALUE BIOMOLECULES OF FOOD AND
PHARMACEUTICAL IMPORTANCE**

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ABSTRACT

The objective of our research is to explore the diverse ecological niches for the discovery and characterization of novel genes encoding stable and efficient biocatalysts, which can be employed for enzymatic transformation of low-cost feed stocks into functional biomolecules of rare occurrence in nature, a demand of the present day. The present lifestyle and dietary habits have generated many health-related risks in society, such as obesity and type 2 diabetes, which subsequently give rise to several health-related issues. Sugar molecules with health-beneficial functions and low glycemic response are gaining attention due to their applications in food and pharmaceutical sectors. Our group has generated metagenomic resources from diverse habitats, and subsequently novel genes encoding promising enzyme systems have been discovered and characterized, such as D-allulose 3-epimerase, amylosucrase, trehalose synthase, and cellobiose 2-epimerase. These enzymes are useful in the biomanufacturing of rare sugar molecules, such as D-allulose, turanose, trehalose, trehalulose and epilactose. D-allulose is an epimer of D-fructose. It is of ultra-low calorie with anti-diabetic nature. It exerts several other benefits to human health, such as hypoglycemic, hypolipidemic, antioxidant, antiobesity, neuroprotective, and rheological properties. Epilactose is a prebiotic molecule, and its consumption enhances calcium and iron absorption. Trehalose is not only useful in the food sector for decreasing freezing point and mitigating insulin resistance but also a potent cryoprotectant of human cells and organs. It is also used as a moisture-retaining molecule in cosmetic products.

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Abstract No. 201

**NANOPARTICLES FOR TARGETED REMOVAL OF
POLLUTANTS ENHANCING AQUATIC BIODIVERSITY**

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ABSTRACT

Recent advances in nanotechnology have enabled the development of nanoparticles with high surface area, reactivity, and adsorption capacity, making them highly effective for targeted removal of pollutants from aquatic environments. By enabling the precise elimination of contaminants such as heavy metals, organic dyes, pharmaceuticals, and microplastics, nanoparticle-based filtration and remediation systems address some of the most critical threats to aquatic ecosystems and their biodiversity. Techniques such as nano-adsorbents, nanofiltration, and photocatalytic nanoparticles offer rapid, selective, and efficient pollutant degradation while minimizing toxic byproducts and operational costs. Bio-inspired and bio-based nanoparticles, synthesized using green methods, are especially promising due to their biocompatibility and eco-friendliness, reducing risks to non-target aquatic life and supporting sustainable ecosystem management. Moreover, integrating nanoparticles with advanced monitoring systems allows for adaptive treatment strategies that support the long-term restoration of water quality and foster the recovery of sensitive species populations. However, attention to the life cycle impacts and potential ecological interactions of nanoparticles remains essential for ensuring positive outcome for aquatic biodiversity. This abstract highlights how nanoparticles, through targeted and sustainable pollutant removal are emerging as transformative tools for protecting and enhancing aquatic biodiversity in the face of increasing pollution pressures.

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Abstract No. 202

**ROLE OF WOMEN IN SOCIAL SUSTAINABILITY
IN INDIAN SOCIO-LEGAL FRAMEWORK**

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ABSTRACT

Women constitute fifty percent of the Indian population. Nevertheless, women have traditionally face discrimination and marginalisation due to entrenched socio-cultural norms is no secret. Cultural norms continue to impede transformative change aiming at women's economic empowerment in the country. Moreover, post-independence, despite advancement in women's civil liberties and availability of the right to vote being available to them, gender parity seems elusive, particularly in terms of political representation, access to quality education and health care. The paper attempts to highlight factors like strengthening education, vocational training, enhanced awareness about legal rights and privileges and legal protection, and the promotion of women in leadership roles will contribute significantly in advancing gender equality in Indian society. Gender equality and sustainable development go hand in hand for lasting prosperity for a nation like India known for its regressive cultural traditions normalising gender discrimination. In this context, India while pursuing Sustainable Development Goals can make tremendous progress towards its march for gender equality, fighting cultural bias against women and thus achieving sustainable development holds relevance for 50% of our population in true sense.

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Abstract No. 203

**THE INFLUENCE OF PROFENOFOS PESTICIDE STRESS ON
THE PROTEIN CONTENT OF LIVER AND KIDNEY TISSUES OF
FRESH WATER FISH *LABEO ROHITA* (HAMILTON,1822)**

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ABSTRACT

India is an agrarian country, about 50% of population is directly or indirectly dependent upon agriculture. Continuous growth in population, rapid industrialization and accompanying technologies involving waste disposal, so the rate of discharge of pollutants into the environment is far higher than the rate of their purification, results in aquatic environmental pollution. The contamination of water causes damage to non-target organisms like fish which are very sensitive to toxic costs. This study aimed to analyse the influence of Organophosphorus pesticide on the fresh water fish *Labeo rohita* on the basis of the biochemical method. In the present investigation , vital tissues of fish *Labeo rohita* are exposed to sublethal concentrations of Profenofos for 24,48 and 96 hours. The Liver is more affected tissue compared with the control group. Influence of pesticides is dose dependent as well as time dependent.

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Abstract No. 204

**INDUCED MUTAGENESIS IN PEPPERMINT FOR HIGH OIL
YIELD AND QUALITY WITH LD₅₀ DETERMINATION**

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ABSTRACT

Peppermint, or *Mentha piperita* L., is esteemed for its menthol-rich essential oil, which serves a variety of purposes. However, concerns including low oil output and poor oil quality have limited the potential of peppermint cultivation. Targeting a menthol content of 36-46% and less than 5% menthofuran, the study aimed to create a noble mutant of *Mentha piperita* that would complement US-type peppermint oil and be distinguished by increased oil yield and enhanced oil quality. Seeds from the menthofuran-rich variety CIM-Indus of *Mentha piperita* were exposed to different levels of gamma radiation (10 Gy, 20 Gy, 30 Gy, 40 Gy, 50 Gy, 70 Gy, 90 Gy, and 110 Gy) in order to induce mutagenesis. LD50 value were found at 40 Gy. Both 30 Gy and 40 Gy treated populations showed a wide range of variance. The resultant mutants showed a wide range of traits, which prompted the selection of better lines. CIM-I452 was notable for having the maximum oil yield and a significant herb yield, followed by CIM-I332 and CIM-I324. CIM-I311 and CIM-I431 were found to be menthofuran-rich, whereas CIM-I43, CIM-I44, CIM-I451, CIM-I32, CIM-I34, CIM-I332, and CIM-I452 were found to be menthol-rich. Furthermore, CIM-I322 and CIM-I331 were identified as lines that are high in limonene. The mutants CIM-I452, CIM-I332, and CIM-I324 were recognised worldwide due to their high menthol content and low amounts of menthofuran. As parental lines for upcoming recombinant breeding or hybridisation endeavours, the chosen mutants CIM-I452, CIM-I332, and CIM-I324 exhibit promise based on essential oil quality, oil yield, and herb yield.

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Abstract No. 205

**STRENGTHENING POLICY, GOVERNANCE,
GLOBAL COOPERATION AND SDGs FOR
SUSTAINABLE CLIMATE ACTION**

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ABSTRACT

Climate change requires strong policies, accountable governance, and global cooperation to ensure sustainable development. Effective climate action depends on integrated frameworks that align national strategies with the Sustainable Development Goals (SDGs). Transparent governance, inclusive decision-making, and cross-sector coordination are essential to support climate mitigation, adaptation, and community resilience. This paper examines the role of policy reforms, institutional governance, and international partnerships in addressing environmental challenges. It highlights how global agreements such as the Paris Accord, climate finance mechanisms, and collaborative platforms improve collective climate responsibility. The study emphasizes that linking SDGs with climate initiatives leads to equitable resource management, protection of vulnerable populations, and long-term ecological security. The findings suggest that robust governance, policy coherence, and global cooperation are fundamental for achieving a climate-resilient and sustainable future. Strengthening these systems will enable societies to respond more effectively to climate risks and advance progress toward the SDGs.

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Abstract No. 206

BIODIVERSITY AND CLIMATE CHANGE

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ABSTRACT

The term given to the variety of life on Earth, provides, through its expression as ecosystems, goods and services that sustain our lives. Human pressures on ecosystems are causing changes and losses at rates not seen historically. People are changing ecosystems more rapidly and more extensively than over any other period in human history. Biodiversity and climate change are deeply interconnected: climate change threatens biodiversity through extreme weather and temperature changes, while the loss of biodiversity accelerates climate change by degrading ecosystems' ability to absorb carbon. Conversely, biodiversity is crucial for climate action, as healthy ecosystems like forests and wetlands are vital for carbon sequestration (mitigation) and adaptation. Therefore, conserving and restoring biodiversity is a critical part of tackling the climate crisis. Climate change adds yet another pressure on natural ecosystems. The resilience of ecosystems can be enhanced and the risk of damage to human and natural ecosystems reduced through the adoption of biodiversity-based adaptive and mitigative strategies. Mitigation is described as a human intervention to reduce greenhouse gas sources or enhance carbon sequestration, while adaptation to climate change refers to adjustments in natural or human systems in response to climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. The impacts of climate change on biodiversity are of major concern to the Convention on Biological Diversity (CBD). The Convention also recognizes that there are significant opportunities for mitigating climate change and adapting to it, while enhancing the conservation of biodiversity. There is evidence that climate change is already affecting biodiversity and will continue to do so. The Millennium Ecosystem Assessment ranks climate change among the main direct drivers affecting ecosystems. Consequences of climate change on the species component of biodiversity include- changes in distribution, increased extinction rates, changes in reproduction timings and changes in length of growing seasons for plants. Some species that are already threatened are particularly vulnerable to the impacts of climate change.

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Abstract No. 207

**TRANSFORMING PAPER WITH NANOTECHNOLOGY:
RECENT DEVELOPMENTS IN NANO-ADDITIVES FOR
ENHANCED PERFORMANCE AND FUNCTIONALITY**

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ABSTRACT

Nanotechnology is rapidly advancing the performance, durability, and functional versatility of paper and paperboard materials. This review synthesizes recent developments in the design, synthesis, and integration of nano-additives—including nanocellulose, nanoclays, metal-oxide nanoparticles, and carbon-based nanostructures—within papermaking and coating processes. Particular emphasis is placed on the physicochemical mechanisms by which these nano-materials enhance mechanical strength, optical properties, barrier performance, and antimicrobial functionality. Nanocellulose, especially cellulose nanocrystals and nanofibrils, demonstrates exceptional potential as a renewable reinforcement, improving tensile characteristics and gas–moisture barrier efficiency. Nanoclays provide layered structures that substantially reduce permeability, making them suitable for high-performance packaging. Metal-oxide nanoparticles such as TiO_2 , ZnO , and Ag contribute additional optical brightening, UV-blocking, and antimicrobial effects, while carbon-based nano-inks—including graphene oxide and conductive carbon nanoparticles, enable paper-based flexible electronics and printed sensor applications. Beyond material performance, the review highlights emerging applications in food and pharmaceutical packaging, security documents, cultural-heritage preservation, and printed electronics. Environmental and safety implications, including nanoparticle release, recyclability, and ecotoxicity are critically evaluated in the context of regulatory frameworks. Despite significant advancements, challenges persist in achieving stable dispersion, ensuring compatibility with industrial papermaking operations, reducing production costs, and scaling up eco-friendly fabrication methods. Future research should focus on green synthesis, multifunctional nano-hybrid systems, and life-cycle assessment to support sustainable adoption of nano-enabled paper technologies.

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Abstract No. 209

**THE BENEFITS OF PROBIOTICS IN HUMAN HEALTH:
A REVIEW**

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ABSTRACT

Probiotics are live microorganisms that confer health benefits when administered in adequate amounts. The use of probiotics has gained significant attention in recent years due to their potential role in preventing and treating various diseases. This review aims to summarize the current evidence on the benefits of probiotics in human health. Probiotics have been shown to have a positive impact on the gut microbiota, enhancing the gut barrier function and modulating the immune system. They have been found to be effective in preventing and treating various gastrointestinal disorders, such as irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), and antibiotic-associated diarrhoea. Additionally, probiotics have been shown to have a beneficial effect on mental health, with potential roles in reducing symptoms of anxiety and depression. The benefits of probiotics extend beyond the gut, with evidence suggesting that they may also have a positive impact on cardiovascular health, obesity, and immune function. Probiotics have been found to have anti-inflammatory properties, which may contribute to their beneficial effects on human health. The mechanisms underlying the benefits of probiotics are complex and multifaceted, involving the modulation of the gut microbiota, the production of antimicrobial peptides, and the stimulation of the immune system. Further research is needed to fully understand the benefits and mechanisms of action of probiotics, as well as to determine the optimal strains and dosages for specific health benefits. In conclusion, the current evidence suggests that probiotics are a promising adjunctive therapy for various diseases, and may have a role in maintaining overall health and well-being. Further studies are needed to confirm the benefits of probiotics and to fully realize their therapeutic potential.

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Abstract No. 210

**BIODEGRADABLE ALTERNATIVES AND GREEN MARKETING
STRATEGIES IN COMBATING PLASTIC POLLUTION**

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ABSTRACT

Plastic pollution and the widespread use of harmful chemical substances have become pressing global concerns, affecting both environmental health and human well-being. Across the world, plastic items—especially single-use products—are still heavily used in public events, commercial activities, and everyday life. As a result, soil, water bodies, and air continue to face increasing levels of contamination. Recognizing the severity of this challenge, governments, environmental institutions, and even private companies have begun adopting eco-friendly materials and promoting plastic-free initiatives. Alongside environmental responsibility, many industries are now using sustainable products as a strategic marketing tool to strengthen brand image, attract environmentally conscious consumers, and build long-term trust. This research paper explores the rise of plastic and chemical pollution, evaluates current plastic-free and biodegradable alternatives, and examines how organizations are integrating sustainability into their marketing practices. The study emphasizes that meaningful progress requires a combination of public awareness, corporate responsibility, supportive government policies, and innovative green marketing strategies to protect natural ecosystems and ensure a cleaner, safer future.

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Abstract No. 211

**FOOD AND HEALTH SAFETY BY NUTRACEUTICALS
WITH SNEDDS FORMULATION**

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ABSTRACT

Ensuring food and health safety in the modern era requires the development of innovative technologies that enhance the delivery, efficacy and safety of bioactive compounds derived from natural sources. Nutraceuticals bioactive food ingredients that provide health benefits beyond basic nutrition have gained tremendous attention for their potential in disease prevention, immune support and overall wellness. Self-Nanoemulsifying Drug Delivery Systems (SNEDDS) offers a promising solution to these challenges, combining solution to these challenges, combining nanotechnology and sustainable formulation science to improve the functional performance and safety of nutraceuticals. SNEDDS are isotropic mixtures of oils, surfactants and co-solvents that form nanoemulsions upon dilution in aqueous media. These formulations enhance the absorption of lipophilic nutraceuticals such as curcumin, resveratrol, coenzyme Q10, carotenoids and omega-3 fatty acids, enabling improved therapeutic and nutritional efficacy. By protecting these compounds from degradation and oxidation; SNEDDS contribute to food quality preservation and ensure consistent health benefits. The use of biodegradable, food-grade excipients in SNEDDS aligns with the principles of food safety, reducing chemical toxicity and ensuring regulatory compliance in nutraceutical applications. The integration of SNEDDS in functional food and dietary supplement formulations can also improve bioefficacy and support sustainable development goals (SDGs) related to human health and well-being. In conclusions, nutraceuticals formulated with SNEDDS represent a breakthrough in achieving food and health safety through enhanced bioavailability, environmental sustainability and consumer protection. This innovative approach supports the creation of safe, effective and sustainable nutraceutical products that contribute to global nutrition security and improved public health outcomes.

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Abstract No. 212

**ECO-AWARENESS IN ACTION: EDUCATION AND
BEHAVIOURAL STRATEGIES FOR A
SUSTAINABLE ENVIRONMENT**

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ABSTRACT

The goal of environmental education is to provide people and communities with the information, abilities, attitudes, and drive necessary to comprehend environmental challenges, make wise decisions, and embrace sustainable practices that preserve and enhance the environment. Environmental education is an ongoing, multidisciplinary process that fosters sensitivity and understanding of environmental issues. It promotes critical thinking, problem-solving skills, and responsible involvement in activities that help solve environmental problems. The experiential approach aims to foster a sense of life's interconnection and establish a connection between students and the natural world. Being environmentally conscious entails realising how delicate our environment is and how important it is to safeguard it. Increasing public awareness of ecosystem functioning, the consequence of human activity and sustainable resource use is largely dependent on educational initiatives and campaigns. Raising awareness enables individuals and groups to protect the environment, cut down on pollution, and promote sustainability. Sustaining environmental improvements hinges on translating awareness into concrete behavioral changes. Encouraging pro-environmental behaviour through societal norms, pledges, prompts, and feedback, adopting legislative modifications that foster circumstances conducive to behaviour modification, community-driven projects and partnerships between local government, NGOs, and residents are some influential strategies for promoting behaviour changes. To create environmentally conscious citizens, governments, organisations, and educational institutions support environmental education. To develop the next generation of environmental stewards, educational initiatives—from classroom projects and field trips to community action and outreach programs—are essential. In conclusion, environmental education increases knowledge and awareness, and carefully planned behavioural modification tactics guarantee that this knowledge results in sustainable action and favourable environmental effects.

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Abstract No. 214

**PLACENTAL LEVELS OF POLYCYCLIC AROMATIC
HYDROCARBONS AND ITS ASSOCIATION WITH
GESTATIONAL AGE**

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ABSTRACT

Polycyclic aromatic hydrocarbons (PAHs) by disturbing the antioxidant defense system are known to be responsible for the induction of early delivery in women. During present study, the association of PAHs exposure with preterm birth was explored by collecting the placental tissue samples after delivery from 124 healthy non-smoking pregnant women. Quantification of PAHs in placental tissue samples were done with the help of gas chromatography equipped with a mass spectrometry detector (GC-MS). A detailed questionnaire and medical records were taken by researchers through face to face inter views. PAHs levels were compared between two groups, control group with women having gestational age ≥ 37 weeks ($n=72$) and case group having gestational age < 37 week ($n=52$). Except for naphthalene, acenaphthene, acenaphthylene and anthracene, mostly PAHs were found to be higher in study group than control and benzo (a) anthracene was significantly higher in preterm delivery group (4.26 ± 7.48 ppb) than full term delivery group (1.94 ± 4.18 ppb). The association between PAHs and gestational age was drawn with the help of linear regression model. Values of the Pearson correlation coefficient clearly shown the significant correlation ($P < 0.05$) of benzo (a) anthracene ($r = -0.194$) and benzo(k)fluoranthene ($r = -0.164$) for the depletion trend of gestational age. Also, the standardized PAHs effect was little higher for Indeno 1,2,3 cd pyrene ($\beta = -0.22$, $P < 0.001$) than that attributed to benzo(a)anthracene ($\beta = -0.11$, $P < 0.05$). This finding suggests the possible role of environmental pollutant like PAHs for inducing early delivery in women.

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Abstract No. 215

WORLD VIEWS ON ENVIRONMENTAL ETHICS

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ABSTRACT

Contemporary environmental ethics only emerged as an academic discipline in the 1970s. It is an idea which is studied in applied ethics. Applied ethics believes that men by his actions have an effect positive or negative on environment. Men's attitude towards world, his own position in the nature and his relation with environment direct his actions towards environment. The questioning and rethinking of the relationship of human beings with the natural environment over the last thirty years reflected an already widespread perception in the 1960s that the late twentieth century faced a human population explosion as part of a serious environmental crisis. Human behavior to environment is evaluated mostly on the basis of three basic ethical beliefs regarding it. They are- First UTILITY VALUE: environment is naturally given for men's enjoyment; it has only utility value, Second, EXISTANCE VALUE: Everything in the nature constitute its perception; has existence or place in the universe. Not only earthly but also the solar system, planets, stars and other elements including human beings complete the creation. For creation and maintenance of life their existence is meaningfully inevitable. Their mutual gravitational force affecting on each other matters for their dependency, proportionate balance, disproportionate imbalance and accordingly acts on for their existence, health, alteration, decomposition, etc. and Third, A BLEND OF THE EARLIER TWOBIDEOLOGIES that believes that environment has both the utility and the existence value as well. Consequent upon these outlooks we have the theories of Anthropocentrism, Biocentrism and Cosmo-centrism regarding the relation of human being with environment.

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Abstract No. 216

**ADVANCES IN GREEN TECHNOLOGY, WASTE
MANAGEMENT AND SOCIAL SUSTAINABILITY**

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ABSTRACT

Green technologies, often called environmentally sustainable technologies, are transformative tools that significantly mitigate environmental impacts by optimising the use of natural resources, reducing pollution, and minimising waste. The increasing urgency of climate change, environmental degradation, and resource depletion has intensified global efforts toward sustainable development. Recent advances in green technology, waste management, and social sustainability offer promising solutions to mitigate these challenges. Green technologies ranging from renewable energy systems and energy-efficient infrastructure to eco-friendly manufacturing processes are driving the transition to a low-carbon economy. In parallel, innovative waste management strategies, including circular economy models, waste-to-energy technologies, and smart recycling systems, are redefining how societies handle waste while minimizing environmental impact. Social sustainability, a critical pillar of sustainable development, emphasizes equity, community resilience, and inclusive growth. Emerging frameworks now integrate environmental justice, participatory planning, and sustainable livelihoods to ensure that technological and ecological progress also supports human well-being. This abstract explores the interlinked advancements in these domains, highlighting their potential to foster a more sustainable, equitable, and resilient future. The effective treatment of waste to be used as a resource in future has a major role in achieving environmental sustainability and moving towards circular economy. Research on advancements in green technology, waste management, and social sustainability explores innovations like AI-driven waste sorting, advanced recycling, waste-to-energy systems, and smart building designs. These technologies contribute to environmental sustainability by reducing pollution, conserving resources, and promoting a circular economy.

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Abstract No. 217

**IMPACT OF CLIMATE CHANGE ON INSECTS:
A MATTER OF SERIOUS CONCERN**

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ABSTRACT

Wildlife includes not only the large animals in the forests, but also insects, birds, small mammals, fish, other aquatic organisms, and the biota within soil. The bulk of all animal life, whether measured by biomass, numerical abundance or numbers of species, comprises of invertebrates such as insects, spiders, worms etc. These innumerable little creatures are far more important for the functioning of ecosystems than the large animals that tend to attract most of our attention. Much attention is focused on declines of large, charismatic animals, but recent evidence suggests that abundance of insects may have fallen by 50% or more since 1970. This is troubling, because insects are vitally important. They are useful in pollination, decomposition of organic material, soil enrichment and aeration, being consumed as food, controlling other insect pests as biological control agents (predators and parasites), research as experimental material, bio-indicators, and warfare as biological weapons etc. Globally, hundreds of insects face the threat of eventual extinction, according to the International Union for the Conservation of Nature (IUCN). This impact could be accounted for mainly due to indiscriminate use of pesticides and now climate change is also affecting the insect population. Climate parameters such as increased temperatures, rising atmospheric CO₂ levels, and changing precipitation patterns have significant impacts on agricultural production and on agricultural insect pests. Therefore, it is high time we think about the consequences the insect decline would result on the ecosystem and definitely it is a matter of major concern for each one of us.

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Abstract No. 218

**ADVANCES IN GREEN TECHNOLOGY AND
WASTE MANAGEMENT**

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ABSTRACT

Green technology also called 'clean technology' or 'environmentally sustainable technology' refers to innovations, products, and practices designed to reduce negative impacts on the environment. It represents an integrative framework of innovative processes and sustainable materials designed to minimize ecological footprints while enhancing resource efficiency across industrial, agricultural, and urban systems. Major types of green technology are renewable energy systems, energy-efficient innovations, sustainable transportations, green building practices, advanced waste management solutions, and water purification technologies. Advancements in green innovation not only contribute to reducing green house gas emissions but also strengthen adaptive capacity in the context of climate change and global sustainability goals. Its main purpose is to conserve natural resources, lower pollution, and support sustainable development. Advances in green technology are transforming waste management systems by promoting resource efficiency, reducing environmental footprints, and supporting circular economy pathways. Renewable energy technologies, such as solar, wind, and geothermal systems, represent the cornerstone of sustainable energy transitions by replacing carbon-intensive fossil fuels with clean, inexhaustible alternatives in to valuable resources and minimizing landfill pressures. Green chemistry and sustainable material innovations aim to replace hazardous substances with eco-friendly alternatives, fostering safer industrial processes and reducing environmental toxicity. Waste management and recycling technologies play a crucial role in circular economy models by transforming waste streams. The review underscores that widespread adoption of green technologies is essential for achieving global sustainability targets and transitioning toward a low-carbon, environmentally secure future.

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Abstract No. 219

**SUSTAINABLE LACTIC ACID PRODUCTION FROM
FOOD WASTE: A GREEN TECHNOLOGY APPROACH**

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ABSTRACT

Lactic acid is one of the most important biobased chemicals and finds broad applications in the food industry, in pharmaceutical formulations, and in the synthesis of biodegradable materials like poly lactic acid (PLA). In recent years, increasing attention has been paid to sustainable development and green technology that encourage the use of renewable and low-cost substrates for bioproduction. Among these, cheese whey and curd whey represent highly promising nutrient-rich by-products of dairy processing for environmentally friendly lactic acid generation. These whey streams contain substantial amounts of fermentable sugars and essential micronutrients, thus allowing efficient microbial conversion independent of any expensive refined substrates. Several literature reports have shown that both cheese whey and curd whey can be efficiently converted into lactic acid, thus meeting both objectives of waste reduction and value addition. Besides diminishing the environmental impact of disposal, reusing such materials increases the economic viability of lactic acid production by drastically reducing raw material costs. The advancements in converting whey and other food-processing by-products into valuable biochemicals highlight a growing shift towards circular and sustainable bioeconomic systems. Harnessing such waste resources contributes to greener industrial processes, supports resource efficiency, and strengthens long-term social and environmental sustainability.

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Abstract No. 220

**CHROMIUM EXPOSURE AND EPIGENETIC
ALTERATIONS IN TUMOR SUPPRESSOR GENES**

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ABSTRACT

Hexavalent chromium is a well-established Group I carcinogen that poses significant health risks through environmental and occupational exposure. Its toxic mechanisms include generation of reactive oxygen species, DNA damage, and critically, epigenetic modifications that can silence tumor suppressor genes. Findings revealed a significant association between chromium exposure and p16 gene hypermethylation in the exposed population compared to unexposed controls, suggesting that environmental chromium contamination may induce early epigenetic changes associated with carcinogenic risk. This research highlights the urgent need for monitoring chromium contamination in water sources and implementing effective remediation strategies to protect public health in developing urban areas. The identification of p16 hypermethylation as a potential early biomarker may facilitate risk assessment and preventive interventions in populations exposed to chromium.

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Abstract No. 221

**ECO-FRIENDLY APPROACHES TO MINIMIZE CARBON AND
PHARMACEUTICAL WASTE IN HEALTHCARE**

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ABSTRACT

Reducing the carbon footprint and pharmaceutical waste in hospitals and community healthcare system is essential to addressing the dual challenges of climate change and public health protection. Health care facilities are significant contributors to greenhouse gas emissions, with hospitals accounting for up to 10% of national emissions in some industrialized countries, largely due to energy use, transport, and the procurement and wastage of pharmaceuticals. To mitigate these impacts, hospitals and community healthcare systems are increasingly adopting strategies such as energy-efficient infrastructure, the use of renewable energy, and sustainable procurement practices. Reducing pharmaceutical waste is equally crucial; initiatives include regular medication reviews, encouraging shared decision-making with patients, using 'starter packs' to minimize drug wastage, and improving the return and recycling systems for unused medications. The transition to digital health solutions, adoption of telemedicine, and promotion of active and public transport further lower emissions linked to healthcare delivery and staff or patient travel. Robust waste management practices, such as recycling and composting, must also be implemented to reduce landfill and incineration—major sources of emissions from healthcare waste. Success in these endeavors requires hospital-wide education, policy incentives, and partnerships with local communities. By integrating these approaches, hospitals and community settings can serve as models for sustainable health, simultaneously safeguarding planetary health and delivering effective patient care.

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Abstract No. 222

**ENVIRONMENTAL CADMIUM CONTAMINATION AND P16
GENE SILENCING: A MOLECULAR EPIDEMIOLOGY STUDY**

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ABSTRACT

Rapid urbanization in developing nations has intensified environmental contamination with toxic heavy metals, particularly cadmium. As a potent epigenetic modifier, cadmium disrupts cellular homeostasis and induces DNA methylation changes in critical regulatory genes. Understanding these molecular alterations is essential for cancer prevention strategies in vulnerable populations. We conducted molecular epidemiological research in endemic areas of northern India, focusing on communities exposed to cadmium-contaminated water sources. Participants included both affected individuals and unexposed controls, allowing for comparative analysis of epigenetic biomarkers. Environmental cadmium levels were characterized in water samples from the study region. Biological specimens were collected and analyzed for cadmium burden and methylation patterns of the p16 tumor suppressor gene using methylation-specific PCR techniques. Our investigation revealed marked differences in p16 promoter methylation patterns between cadmium-exposed and control populations, establishing a clear link between environmental metal exposure and gene-specific epigenetic alterations associated with oncogenic transformation. This research provides molecular evidence supporting the carcinogenic potential of environmental cadmium exposure through epigenetic mechanisms. Results advocate for enhanced water quality monitoring, public health surveillance programs, and targeted interventions in contaminated regions. The identification of methylation biomarkers offers promise for early risk detection and disease prevention in exposed communities.

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Abstract No. 223

**NANOTECHNOLOGY REVOLUTIONIZING AGRICULTURE:
FROM NANOFERTILIZERSTO ECO-FRIENDLY SOLUTIONS
AND AGROCHEMICAL REMEDIATION: A REVIEW**

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ABSTRACT

For decades, fertilizers have boosted agricultural productivity but at high economic, environmental and health costs. Nano-fertilizers offer a sustainable and cost-effective alternative by serving as efficient nutrient carriers with controlled release and targeted delivery, thereby reducing the need for excessive agrochemicals. Their integration with microorganisms as nano-biofertilizers. Further enhances soil fertility and crop yield. With potential to cut conventional fertilizer use by 50%, nanomaterials also interact uniquely with plant systems through stomatal entry or vascular penetration. This review highlights the production, mechanisms, soil interactions and environmental implications of nano-fertilizers, emphasizing their role in mitigating biodiversity loss, biomagnification and soil fauna decline caused by agrochemicals. Finally, it underscores the need for advanced research and policymaking to harness nanotechnology for sustainable agriculture and agrochemical remediation.

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Abstract No. 224

**ASSESSMENT OF FISH DIVERSITY IN BHUILA LAKE
UNDER CHANGING CLIMATIC CONDITIONS**

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ABSTRACT

Fish diversity represents a crucial component of aquatic ecosystems, serving as both an indicator of ecological integrity and a vital resource that supports food security and local livelihoods. The maintenance of this diversity is essential for sustaining the ecological balance of freshwater environments. However, escalating anthropogenic activities and climate-driven environmental alterations have increasingly contributed to the degradation of lake ecosystems that once supported rich aquatic biodiversity. The present study examines the fish diversity of BhUILaLake, situated in Basti district, Uttar Pradesh, India, to evaluate its current ecological status in the context of climate change. Over study period, fourteen fish species belonging to three orders and six families were documented. The family Cyprinidae exhibited the highest species richness (six species), followed by Bagridae (three species) and Notopteridae (two species). Families Saccobranchidae, Siluridae, and Ophiocephalidae were each represented by a single species. The results indicate that the overall fish diversity in BhUILa Lake is comparatively low, largely due to its hydrological isolation and reduced connectivity with adjacent water bodies. These findings underscore the importance of conservation-focused lake management, which incorporates environmental ethics, habitat restoration, and active community engagement. Strengthening these strategies is essential for enhancing biodiversity resilience and safeguarding ecosystem services amid ongoing climatic shifts.

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Abstract No. 225

**ACHIEVEMENTS AND CHALLENGES IN GENETIC
IMPROVEMENT OF OPIUM POPPY
(*PAPAVER SOMNIFERUM* L.)**

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ABSTRACT

The opium poppy (*P. somniferum* L.) has immense pharmaceutical importance due to possess therapeutically important opium alkaloids like morphine, codeine, thebaine, narcotine, etc., which have sedative, antispasmodic and anticholinergic properties. These valuable alkaloids are mainly extracted in India from green unripe capsules but globally it is extracted from the dried capsule which is called CPS (Concentrated poppy straw) system. In CPS system, the dried capsules along with eight inches of peduncle are harvested for extraction of alkaloids. Its medicinal importance kept apart, an opium poppy seed has considerable importance as culinary item in India. Opium poppy seed contains protein up to 24%, other vital nutrients and are rich sources of the fatty oil, beneficial for human health. Due to increasing demand of opium poppy seeds as spices and in foods, union government focuses to develop improved high seed yielding CPS varieties (latex-less/morphine-less). Since, opium poppy is widely and commonly used for dual purpose i.e. spice (seed) and pharmaceuticals (alkaloids), so that government has given major emphasis for its genetic improvement on both these aspects. Through intervention of conventional, hybridization, mutation and polyploidy breeding, CSIR-CIMAP has developed many high yielding and improved varieties of opium poppy.

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Abstract No. 226

**INTEGRATING ETHICS INTO CLIMATE ACTION:
A PATHWAY TO HUMAN WELFARE**

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ABSTRACT

Climate change is frequently viewed as a purely scientific challenge that requires technical solutions, such as new energy sources or carbon capture. However, this paper argues that effective mitigation is also a profound ethical issue that directly determines the future of human well-being. This study provides a broad overview of why we must balance the urgent need to reduce environmental damage with the moral duty to protect societies. The discussion highlights that “mitigation”—the effort to stop global warming—cannot be separated from human values. If we focus only on saving the planet but ignore the needs of people, our solutions may be unfair or harmful to vulnerable communities. The paper suggests that a healthy planet is the absolute foundation for a healthy human life. Therefore, protecting the environment is not just about saving nature; it is a way of upholding human rights and dignity. Furthermore, the paper examines how ethical decision-making can guide us toward better policies. It proposes that true progress requires us to look beyond simple economic statistics and consider the quality of life. By bringing together the technical side of climate action and the moral side of environmental ethics, we can create a future that is both sustainable and just. The conclusion stresses that genuine human well-being depends on a unified strategy that respects both the Earth and its inhabitants equally.

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Abstract No. 227

**A STUDY OF BIOCHEMICAL CHARACTERIZATION OF
PARTICULATE MATTER AND ITS SEASONAL PATTERN
IN THE AMBIENT AIR OF AGRA**

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ABSTRACT

Urban aerosols significantly impact air quality and public health through their diverse physical, chemical, and biological properties, with concentrations and composition varying across seasons and microenvironments. Previous studies focused on individual aerosol components, but integrated assessments of their coordinated dynamics are limited, hindering comprehensive exposure evaluation and targeted mitigation strategies. Therefore, we conducted a multi-parameter analysis across roadside and industrial sites in Agra, India, integrating gravimetric PM measurements, trace metal, culturable bioaerosol quantification, and size-resolved mass and number distributions. Our results reveal synchronized seasonal cycles: Winter stagnation: high PM_{2.5} (150-200 $\mu\text{g}/\text{m}^3$), severe copper enrichment ($>1000\times$), low bioaerosol ($\sim 250 \text{ CFU}/\text{m}^3$). Monsoon reverses this pattern via wet scavenging. Pre-monsoon periods exhibit peak coarse particle loading (180 $\mu\text{g}/\text{m}^3$), maximum bioaerosol concentrations (500 CFU/m^3 , fungi), and elevated metal enrichment, creating simultaneous exposure to dust, toxic metals, and viable microorganisms. Size distributions transition from winter bimodal patterns (submicron combustion aerosols, supermicron dust) to coarse-dominated pre-monsoon distributions, demonstrating the dynamic interplay between emission sources and meteorological processes. These findings establish that urban air quality is governed by coordinated multi-pollutant cycles rather than independent component variations, necessitating integrated, seasonally adaptive management approaches for effective public health protection in rapidly urbanizing regions.

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Abstract No. 228

**ARTIFICIAL INTELLIGENCE IN CLIMATE CHANGE
MITIGATION FOR HUMAN WELLBEING**

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ABSTRACT

The rate at which the earth is change is unprecedented. Climate change represents one of the most pressing global challenges of the 21st century, with greenhouse gas (GHG) emissions being the primary driver. As efforts intensify to limit global warming, Artificial Intelligence (AI) has become a key enabler in reducing emissions and facilitating sustainable solutions. Artificial Intelligence (AI) supports climate change mitigation in ways that can directly and indirectly enhance human wellbeing, especially through cleaner air, safer cities, resilient food systems, and stronger health protection. Artificial Intelligence (AI) is increasingly recognized as a powerful tool for addressing the challenges of climate change. AI optimizes energy systems by forecasting demand, integrating renewables into power grids, reducing transmission losses, and improving building efficiency, which cuts greenhouse gas emissions and air pollution that harm health. Industry and transport use AI for process control, route optimization, logistics, and predictive maintenance, lowering fuel use and emissions while improving occupational safety and reducing accident risks. Urban planners apply AI to smart meter data, traffic flows, flood-risk maps, and air quality sensors to design more livable, low carbon cities with less congestion, heat stress, and exposure to pollutants. Environmental monitoring systems use AI on satellite and sensor data to detect deforestation, wildfires, and ecosystem degradation early, helping protect biodiversity and ecosystem services that underpin food, water, and mental health. AI powered precision agriculture (e.g., drone and satellite analytics, weather-informed advisory systems) helps farmers optimize irrigation, fertilizer, and pest management, increasing yields while reducing emissions and chemical exposure. Health systems employ AI for surveillance of climate sensitive diseases, combining climate, environmental, and clinical data to predict outbreaks (e.g., vector-borne and respiratory diseases), enabling earlier, targeted public health responses. Telemedicine and digital health platforms reduce travel emissions, support continuity of care during extreme events, and can deliver heat alerts or air-quality guidance, thereby reducing climate related morbidity and mortality. Frameworks now assess AI for climate projects using metrics such as emissions reduction, energy efficiency, equity, inclusivity, and long-term sustainability, emphasizing that benefits for human wellbeing depend on governance and justice.

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Abstract No. 229

**PHYSIO-SOCIAL DEVELOPMENT LEADING TO
A SHIFT IN CHRONOTYPE IN ADOLESCENTS**

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ABSTRACT

Adolescence is a critical transitional phase characterized by significant physiological and behavioral changes. This study investigated the differences in daily behaviors and preferences between relatively younger adolescents (YAs; mean age 14 ± 01 years) and older adolescents (OAs; mean age 17 ± 01 years) using the Horne and Östberg Morningness-Eveningness Questionnaire (MEQ). A total of 502 adolescents from Lucknow, India, participated in the study. The results showed that most participants were of neither type (52.11 ± 0.34 for YAs and 50.57 ± 0.31 for OAs), followed by morning and evening types. YAs preferred earlier bedtimes (2100-2214 hours) and had longer sleep durations than OAs, who had delayed sleep onset (2215-0044 hours). Wake times were similar in both groups, likely due to their social obligations. YAs experienced fatigue and sleepiness earlier in the evening and preferred mentally and physically demanding tasks in the morning. In contrast, OAs preferred morning hours for mental tasks and evening hours for physical tasks. A shift towards eveningness was observed in OAs. Factors influencing these differences include pubertal changes, parental guidance, school schedules, cultural contexts and home environments. This study highlights the importance of understanding sleep patterns and task performance in adolescents during this transitional stage. These findings can help us understand circadian preferences during developmental trajectories. This information can also be used to improve age-based sleep hygiene, academic routines, and emotional development in adolescents, considering variations in lifestyle and circadian preferences within this age group.

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Abstract No. 230

**IMPACT OF CLIMATE CHANGES ON CULTURAL HERITAGE:
A CASE STUDY ON CONSERVATION OF SILVER ARTEFACTS
AT SALARJUNG MUSEUM, HYDERABAD**

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ABSTRACT

Climate changes pose continuous challenges to the preservation of cultural heritage, particularly in experiencing fluctuations in temperature, humidity, and atmospheric pollutants. Silver artefacts are especially vulnerable due to their sensitivity to corrosion in changing environmental conditions. This study examines the impact of climate change-induced microclimatic variations on the conservation of silver artefacts at the Salar Jung Museum, Hyderabad. By analysing environmental data, corrosion patterns, and current preventive conservation practices within the museum, this paper will highlights the increased risks associated with rising relative humidity, pollutant concentration, and seasonal extremes characteristic of Hyderabad's evolving climate. The case study identifies specific deterioration mechanisms affecting the museum's silver collection—such as tarnishing, pitting, and surface instability—and evaluates the effectiveness of existing environmental control and storage strategies.

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Abstract No. 231

**SEASONAL LIMNOLOGICAL ASSESSMENT OF
BHUILA LAKE HIGHLIGHTING CLIMATE-DRIVEN
VARIATIONS IN WATER QUALITY**

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ABSTRACT

Water is fundamental to sustaining all forms of life, yet its quality is increasingly threatened by pollutants such as industrial chemicals, pesticides, sewage discharge, and solid waste. This degradation poses severe risks to both aquatic ecosystems and human health. The present study assesses the water quality and ecological stress of BhUILa Lake, an important freshwater ecosystem that supports local biodiversity and community livelihoods. As climate change alters rainfall patterns and temperature regimes, the limnological characteristics of the lake are becoming increasingly vulnerable. A study period (November 2023–October 2024) was conducted across six sampling sites representing three major seasons—summer, monsoon, and winter. Physicochemical parameters including temperature, turbidity, pH, TDS, total hardness, DO, BOD, COD, alkalinity, bicarbonates, chloride, sodium, calcium, and others were measured following standard protocols. Findings indicate that most water quality parameters—atmospheric and water temperature, pH, TDS, BOD, COD, total hardness, total alkalinity, chloride, calcium, and bicarbonate show peak values during the summer season. Transparency and dissolved oxygen (DO) were highest in winter, while turbidity, sodium, and potassium reached maximum levels during them on soon. These seasonal fluctuations reflect the combined impacts of climatic variations and anthropogenic pressure. The study underscores an urgent need for public awareness, pollution control, and sustainable lake management practices to protect the ecological integrity of BhUILa Lake and ensure the long-term availability of freshwater.

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Abstract No. 232

**HEAVY METAL CONTAMINANTS OF GROUND WATER IN
TUTICORIN DISTRICTS OF TAMIL NADU, INDIA**

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ABSTRACT

Geochemical structure, Industrial wastes and agrochemicals create a potential source of heavy metal pollution in the aquatic environment. A comprehensive study has been carried out with respect to cadmium, chromium, lead, manganese, copper, and zinc and mercury contamination of ground water in Tuticorin district of Tamil Nadu, South India. The ground water samples from 20 different locations from industrial as well as domestic areas were collected in Pre and Post monsoon seasons. The metals were analyzed by using Atomic Absorption Spectroscopy (AAS) and the results were compared with the WHO and BIS standards for potable water. The toxicity of metal is dependent on their solubility and this in turn depends on pH and on the presence of different types of anions and cations. The levels of dissolved heavy metals Cd, Cr, Zn, Cu, and Hg were found to be below the maximum permissible limit prescribed by WHO and BIS standards for drinking water. The concentration of lead and manganese were found to be above the maximum permissible limit prescribed by WHO and BIS standards for drinking water in study area. A slight increment in heavy metal concentration is produced in post monsoon season than the pre monsoon season. The metal concentration of ground water in the district follows the trend $Zn > Mn > Pb > Cu > Hg > Cr > Cd$ in pre monsoon and post monsoon season. A measurements and results analysis shows that rocks weathering and anthropogenic inputs are found to be the main sources for heavy metals in ground water.

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Abstract No. 234

**NATURAL RESOURCES DOCUMENTATION FOR
CONSERVATION THROUGH PEOPLE BIODIVERSITY
REGISTER (PBR) OF VILLAGE LAXMIPUR, MAHARAJGANJ,
UTTAR PRADESH**

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ABSTRACT

India is one of the recognized mega-diverse countries of the world, harbouring nearly 7-8% of the recorded species of the world, and representing 4 of the 34 globally identified biodiversity hotspots. India is also a vast repository of traditional knowledge associated with biological resources. So far, over 91,200 species of animals and 45,500 species of plants have been documented in the ten biogeographic regions of the country. For India, conservation of biodiversity is crucial not only because it provides several goods and services necessary for human survival, but also because it is directly linked with providing livelihoods to and improving socio-economic conditions for millions of local people, thereby contributing to sustainable development and poverty alleviation. In the backdrop of the varying socio-cultural milieu and often conflicting demands of various stakeholders, there is an urgent need for augmenting and accelerating the efforts for conservation and sustainable use of biodiversity and for the fair and equitable sharing of benefits arising from the utilisation of genetic resources. An excellent opportunity of taking the practice of science right down to the grass-roots has recently opened up with the passage of The Biological Diversity Act, provisions of Section 41 mandates that “*every local body must form a Biodiversity Management Committee (BMC) to promote the conservation, sustainable use, and documentation of biological diversity in its area*”. The BMC's responsibilities include preserving habitats, conserving landraces, folk varieties, and animal breeds, including documenting People's Biodiversity Register (PBR) in consultation with local people, the register shall contain comprehensive information on availability and knowledge of local biological resources, their medicinal or any other use or any other traditional knowledge associated with them.” This paper communicates the efforts carried out to document the village resources, including its socioeconomic, historical, and cultural aspects as well as its natural habitats of village Laxmipur in Maharajganj district.

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Abstract No. 235

**BIODIVERSITY PERSPECTIVE OF FOOD,
HEALTH AND SOCIETY IN JAMMU AND KASHMIR**

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ABSTRACT

Jammu and Kashmir, nestled in the western Himalayas, boasts rich biological resources fundamental to food security, human health, and societal well-being. The region's varied climate supports a wide range of crops, including fruits, vegetables, and grains, ensuring food security and resilience to climate change. Local communities rely on traditional food systems closely linked to their cultural heritage and biodiversity. Biodiversity ensures a wide range of crops, enhancing food security and resilience to climate change. Jammu and Kashmir is home to diverse medicinal flora, with many plants used in traditional medicine to treat various ailments. Biodiversity ensures clean air and fresh water, essential for human health. Diverse crops provide essential nutrients, vitamins, and minerals, promoting healthy diets. Well-preserved ecosystems help regulate disease outbreaks and promote human health. Biodiversity supports ecosystem services like pollination, pest control, and soil health, crucial for sustainable agriculture. Biodiversity helps to regulate ecosystems, reducing the risk of disease outbreaks and promoting human health. Exposure to nature and biodiversity has been linked to improved mental health and well-being. Biodiversity is deeply ingrained in the region's culture, with many communities relying on natural resources for their livelihood. Biodiversity is often closely tied to cultural heritage and traditional practices. Biodiversity supports industries like forestry, fisheries, and tourism, contributing to local economies. Biodiversity supports local economies through sustainable use of natural resources like timber and fiber. Biodiversity conservation often involves community participation, fostering a sense of ownership and responsibility. Human activities pose significant threats to biodiversity, including habitat destruction and climate change. But initiatives like protected areas and sustainable forest management can help conserve biodiversity. Balancing economic development with biodiversity conservation is essential for the region's long-term sustainability.

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Abstract No. 236

**NUTRITIONAL VALUES, USES AND PHARMACOLOGICAL
STUDIES IN IVY GOURD (*COCCINIA INDICA* L.)**

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ABSTRACT

Ivy gourd (*Coccinia. indica* L.) is known as 'Kundru' is a nutrient rich fast growing perennial vine plant of Cucurbitaceae family. It is a dioecious, perennial and herbaceous climber or trailing vine with glabrous stems and tuberous roots. Grows abundantly all over India, Tropical Africa, Australia, Fiji and throughout the oriental countries. It has long, tuberous, fleshy roots and smooth, green fruits. Microscopy of root shows parenchyma, phelloderm, pericyclic fibers, stone cells, starch grains. The plant has also been used extensively in Ayurvedic and Unani practice in the Indian subcontinent. its medicinal and nutritional qualities and its allplant parts like roots, leaves and fruits are used in local medicinal purposes like jaundice, diabetes, wound healing, ulcers, stomach ache, skin disease, fever, asthma, cough. It is a wonderful vegetable plant species having various pharmacological properties like analgesic, antipyretic, anti-inflammatory, antimicrobial, antiulcer, antidiabetic, antioxidant, hypoglycemic, hepatoprotective, antimalarial, antidyslipidemic, anticancer, antitussive, mutagenic. Its vegetables are considered to be protective foods and highly beneficial for the maintenance of good health and prevention of diseases Ivy gourd fruits are rich in lycopene (5.68 mg / 100 g), -carotene (2.24 mg / 100 g) and leaves contain protein (3.3-4.9g), vitamin A (8000-18000 IU). Fruits are antidiabetic and having antioxidant property.

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Abstract No. 237

**AIR QUALITY DEGRADATION AND ITS BIOLOGICAL
CONSEQUENCES: THE CASE OF VITAMIN D DEFICIENCY**

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ABSTRACT

The impact of air pollution on sunlight exposure and its consequent effect on Vitamin D synthesis has been studied. Vitamin D deficiency has become a major global health issue, particularly in densely populated and industrialized regions where pollutants such as PM_{2.5}, PM₁₀, NO₂, and SO₂ significantly block ultraviolet B (UVB) radiation required for cutaneous Vitamin D production. By analyzing peer-reviewed studies, environmental reports, and comparative data from urban and rural populations, the review identifies a strong correlation between high pollution levels and reduced Vitamin D status. Findings show that individuals living in polluted cities exhibit higher rates of deficiency, contributing to adverse health outcomes including weakened immunity, bone disorders, and metabolic diseases. The review highlights the need for improved air quality policies, public health interventions, supplementation strategies, and urban planning solutions to enhance sunlight exposure. Future research should address seasonal variations, long-term exposure, and technological innovations for monitoring UVB availability.

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Abstract No. 238

**COMBINED ALKALOID PROFILING OF OPIUM POPPY
(*PAPAVER SOMNIFERUM* L.) GENOTYPES ACROSS TWO
YEARS FOR IDENTIFICATION OF HIGH-YIELDING LINES**

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ABSTRACT

Opium poppy (*Papaver somniferum* L.) is the primary commercial source of pharmacologically important alkaloids such as morphine, codeine, thebaine, papaverine, and noscapine. Identifying high-yielding and stable alkaloid-producing genotypes is essential for strengthening industrial alkaloid production. In this study, eight released varieties (Vivek, CIM-Ajay, Rakshit, Sanchita, Sujata, Shyama, Sweta, and Sampada) and seven breeding lines (DWSLT, VE01, SHW-4A, VG46, VN3511, SNW-F, and VG05) were evaluated over two consecutive years (2023–24 and 2024–25) under field conditions at CSIR-CIMAP. Alkaloid profiling was carried out for four capsule-peduncle combinations (only capsule, capsule + 5 cm peduncle, capsule + 10 cm peduncle, and only peduncle) to assess variation in alkaloid accumulation within plant parts. A wide quantitative range was observed for all alkaloids, with morphine varying between 0.003–0.292% in 2023–24 and 0.000–0.176% in 2024–25, while noscapine ranged from 0.000–0.076% and 0.001–0.044% across the two years. Several genotypes consistently outperformed others across both years. DWSLT (capsule + 5 cm peduncle) and SNW-F (only peduncle) recorded the highest morphine levels, whereas VN35-11, SHW-4A, and VE01 exhibited superior performance for codeine and thebaine. Genotypes such as VE01 and VG05 showed stable and moderate-to-high noscapine accumulation across years. Conversely, Shyama (only peduncle) and Vivek (capsule + peduncle combinations) showed consistently low alkaloid content. The combined two-year analysis highlights significant genotypic variability and identifies promising high-alkaloid candidates suitable for targeted breeding, industrial extraction, and varietal improvement programmes. These results reinforce the importance of capsule–peduncle selection in maximizing alkaloid yield and provide a comprehensive dataset for advancing future opium poppy improvement efforts.

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Abstract No. 239

**SPATIAL AND SEASONAL DYNAMICS OF WATER QUALITY IN
AYODHYA CITY, UTTAR PRADESH: IMPLICATIONS FOR
SUSTAINABLE WATER RESOURCE MANAGEMENT**

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ABSTRACT

The growing pressures of rapid urbanization, population increase, and changing climatic patterns have intensified concerns over freshwater degradation worldwide. Ayodhya city, an emerging urban centre in Uttar Pradesh, faces similar challenges as its water resources experience increasing stress from land use alterations and anthropogenic activities. This study provides a comprehensive assessment of the spatial and seasonal dynamics of surface and groundwater quality across Ayodhya, integrating physicochemical analyses, land use and land cover (LULC) evaluation, and advanced computational techniques. Water samples collected from diverse locations across different seasons were evaluated for key physical, chemical, and biological parameters. Descriptive statistics were applied to quantify spatial variations and temporal fluctuations, while Geographic Information Systems (GIS) enabled spatial mapping of water quality indicators and their association with LULC patterns. The Water Quality Index (WQI) was computed to derive a consolidated measure of water suitability for domestic and agricultural use. Preliminary findings suggest that urban and peri-urban areas exhibit elevated concentrations of pollutants, influenced by impervious surface expansion, agricultural runoff, and inadequate wastewater management. Seasonal shifts, particularly between pre-monsoon and post-monsoon periods, further accentuate these variations. The study also explores the application of soft computational approaches to develop predictive insights and support sustainable water resource management strategies. The outcomes provide critical inputs for policymakers, planners, and environmental managers working to safeguard the long-term health of Ayodhya's aquatic ecosystems and ensure reliable water access for future generations.

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Abstract No. 240

**HUMAN RESPONSIBILITIES DURING
ENVIRONMENTAL CRISIS**

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ABSTRACT

The escalating environmental crisis demands urgent examination of the ethical dimensions governing human interactions with nature. This study explores environmental ethics as a philosophical framework that defines moral obligations toward the natural world and establishes corresponding human responsibilities essential for ecological sustainability. Environmental ethics challenges traditional anthropocentric worldviews by recognizing that nature possesses intrinsic value beyond human utility. The research analyzes key ethical theories including deep ecology, land ethics, and environmental justice, demonstrating how each framework informs distinct patterns of human responsibility. Deep ecology emphasizes biospheric egalitarianism, while land ethics, pioneered by Aldo Leopold, advocates for viewing humans as members rather than conquerors of the ecological community. Human responsibilities emerge at multiple levels. Individually, people must adopt sustainable consumption practices, minimize carbon footprints, and make environmentally conscious decisions. Corporately, businesses bear responsibility for reducing pollution, implementing circular economy principles, and ensuring transparent environmental accountability. Governments must enact protective legislation, enforce environmental standards, and prioritize long-term ecological health over short-term economic gains. The study particularly emphasizes intergenerational responsibility—our moral obligation to preserve environmental resources for future generations. Current environmental degradation, including climate change, deforestation, and species extinction, represents an ethical failure to honor this responsibility. Furthermore, the research addresses environmental justice, highlighting how marginalized communities disproportionately suffer environmental harm, thereby linking ethical environmental action with social equity. This investigation concludes that environmental ethics provides the necessary moral compass for transforming human behavior. By embracing our responsibilities as ecological citizens, humanity can forge a sustainable path that respects both present needs and future possibilities, ensuring planetary health and biodiversity preservation for generations to come.

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Abstract No. 241

**FROM ETHICAL RESPONSIBILITY TO ACTION:
BEHAVIOURAL CHANGES FOR
ENVIRONMENTAL SUSTAINABILITY**

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ABSTRACT

Environmental ethics present an ideal form of ethical relationship between humans and the natural environment. It helps us think about our responsibility towards the planet Earth and future generations. It emphasises that nature is not only a resource for exploitation but humans also have a greater moral responsibility towards it. Generally, environmental protection is seen as a moral duty, but in reality, protecting the environment is protecting future generations because human existence on the earth is entirely dependent on nature. The exploitation of natural resources has caused ecological imbalance. Addressing environmental issues requires more than just a sense of moral duty; it demands behavioural changes. Tackling these issues is also linked to the choices people make every day. Human actions, such as energy use, waste management, or purchasing products, directly impact the environment. Achieving sustainable development goals requires a change in behavioural patterns. Such changes can only be achieved through individual and collective efforts. Behavioural changes rooted in moral responsibility offer a practical solution to environmental problems. The present paper attempts to discuss various aspects of behavioural changes. It further discusses individual and collective efforts being made to bring about behavioural changes for environmental protection.

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Abstract No. 242

**POLLUTION RESISTANT ELECTRICAL INSULATORS OF
CYCLOALIPHATIC EPOXY ESTERS**

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ABSTRACT

Overhead line outdoor electrical insulators are devices used to structurally support the bare conductors of overhead power lines while providing electrical isolation from the supporting poles or towers. Traditionally, they are made from materials like porcelain, glass, or ceramic and are designed to withstand high voltages and prevent electrical leakage to the ground. The main drawback associated with these materials are, their large size, brittleness and difficulty to design large complex parts. Replacing overhead line porcelain insulators with cycloaliphatic epoxy esters alternatives is a common modernization practice driven by the superior mechanical and electrical performance, durability, and lower lifecycle costs of the epoxy material. Epoxy insulators have significantly higher flexural, tensile, and compressive strength (up to 18 times the flexural strength) compared to porcelain, making them more resistant to impact damage, vibrations, and harsh weather conditions. They are up to 70% lighter than porcelain insulators, which simplify transportation, handling, and installation, and reduce the load on support structures. The molding capabilities of epoxy resin allow for more complex and compact designs tailored to specific voltage and mechanical load requirements, which is not as easily achievable with porcelain. Cycloaliphatic epoxy is non-tracking, self-cleaning, and highly resistant to UV radiation, moisture, and chemical pollutants. This leads to more stable performance in contaminated environments and requires less frequent cleaning and maintenance compared to porcelain. They exhibit high dielectric strength, lower partial discharge, and can withstand high-power arcs without damage, improving overall system reliability and safety.

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Abstract No. 243

**WILD EDIBLE PLANTS USED AS FOOD SUPPLEMENT
AMONGST THE RURALS OF BANDA DISTRICT (U.P.)**

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ABSTRACT

Wild plants play a significant role in the substance of rural life. These wild edible plants is not only useful during famine and scarcity periods but also provide as a substitute to the diet to the tribal and rural population. A Ethno botanical studies on wild edible plants of Banda district was carried out during 2009-2013. A total of 20 species of wild edible plants belonging to 17 families were found to be used as food supplement by the rurals of Banda district are discussed in the present communication.

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Abstract No. 244

**SEASONAL STUDY OF PHYSICOCHEMICAL
CHARACTERISTICS OF SAI RIVER WATER
IN PRATAPGARH, U.P.**

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ABSTRACT

The Sai River in Pratapgarh district serves as a lifeline for the surrounding flora and fauna, supporting a diverse ecosystem. However, the discharge of untreated domestic, agricultural, and industrial wastewater, coupled with rapid population growth, has increasingly degraded its water quality and aquatic life. The present study evaluates seasonal variations in key water quality parameters of the Sai River across three sampling sites (Site I, Site II, and Site III) during winter, summer, and rainy seasons. Water samples were analyzed for various physicochemical characteristics using standard procedures. Results revealed a significant increase in temperature, turbidity, and biochemical oxygen demand (BOD) during the summer season at all sites compared to winter and rainy seasons. pH values were higher in winter but decreased during the rainy season. Dissolved oxygen (DO) levels increased notably during the rainy season. Chemical oxygen demand (COD) and total alkalinity (TA) remained within acceptable limits across all seasons. Total dissolved solids (TDS), total suspended solids (TSS), total hardness (TH), electrical conductivity (EC), and concentrations of chloride (Cl^-), nitrate (NO_3^-), and phosphate (PO_4^{3-}) were found to be lower in summer and rainy seasons relative to winter. This study highlights the urgent need for pollution control strategies, continuous monitoring of the river system, and conservation efforts to protect aquatic biodiversity and maintain ecological balance.

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Abstract No. 245

**GLOBAL MICROBIOMES OF CULTURAL HERITAGE
OBJECTS: PATTERNS, CLIMATIC DRIVERS &
CONSERVATION STRATEGIES AGAINST
BIODETERIORATION**

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ABSTRACT

Cultural heritage objects consist of the paintings, textiles, manuscripts, wooden and metal artifacts, stone monuments and other structures that hold a significant artistic, historical as well as cultural value - representing the preserved identity and legacy of our previous civilizations. Such objects harbor diverse microbial communities, such as lichen, molds, fungi, bacteria, etc. - with variation in their composition due to different geographical location and environmental factors. Climatic change conditions such as fluctuating temperatures, elevated humidity, disturbed precipitation cycle, environmental pollution, rising sea levels, extreme weather events etc. can reshape the associated microbiota, thereby accelerating the biodeterioration of these heritage structures. This review consolidates recent molecular studies on microbiomes associated with various cultural heritage materials across diverse climatic regions around the globe. Integrating microbiome data into preventive conservation and adopting sustainable, climate-adaptive treatments are essential for safeguarding heritage collections. Key research gaps and future priorities for microbiome-informed conservation strategies are also outlined.

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Abstract No. 246

**CLIMATE CHANGE AND FOOD SECURITY:
A GROWING CONCERN**

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ABSTRACT

The primary cause of climate change is human activities that release greenhouse gases into the atmosphere. The main culprits are the burning of fossil fuels (coal, oil, and gas) for energy, transportation and industry as well as deforestation and certain agricultural practices. These activities lead to an increase in the concentration of greenhouse gases like carbon dioxide and methane etc. which trap heat and cause the planet to warm. Climate change affects the environment in many different ways including rising temperatures, sea level rise, drought, flood etc. and these events affect things that we depend upon and value like water, energy, transportation, wildlife, agriculture, ecosystems, and human health. Climate change significantly impacts food security through various interconnected pathways including disruptions to agricultural production, shifts in food shortages and price increases that lead to increased risks of hunger and malnutrition. Extreme weather events, altered precipitation patterns and rising temperatures negatively affect crop yields, livestock productivity and fisheries while also impacting food quality and safety. These biophysical changes, combined with social and economic vulnerabilities can lead to reduced incomes, eroded livelihoods and trade disruptions, ultimately threatening food access and availability for vulnerable populations. There is a need to control the causes of climate change and develop the strategies so that everybody should get sustainable foods.

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Abstract No. 247

CLIMATE CHANGE AND ITS EFFECTS ON STORED GRAINS

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ABSTRACT

Climate change poses significant risks to the quality, safety, and availability of stored grains. Rising global temperatures accelerate insect population growth, increasing infestation levels inside storage facilities. Additionally, elevated humidity and irregular rainfall patterns raise the moisture content in grains, creating optimal conditions for fungal proliferation, including toxigenic species such as *Aspergillus* and *Fusarium*. These fungi not only reduce the nutritional value of grains but also produce harmful mycotoxins that threaten food safety and public health. Furthermore, extreme weather events disrupt post-harvest handling and transport, heightening the probability of spoilage before grains reach storage centers. Climate-induced fluctuations in atmospheric CO₂ and temperature also affect grain respiration rates, leading to faster deterioration and higher storage losses. In many regions, traditional storage structures are not designed to withstand the new thermal and humidity stress levels, resulting in reduced shelf life and increased economic losses for farmers. Overall, climate change magnifies biological, environmental, and infrastructural challenges across the grain storage chain. Addressing these impacts requires improved storage technology, better monitoring systems, and climate-resilient agricultural practices to safeguard food security in vulnerable regions.

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Theme: CLIMATE CHANGE: MITIGATION AND
ENVIRONMENTAL ETHICS FOR HUMAN WELL-BEING

6 & 7 December, 2025

Abstract No. 248

**HUMAN RESPONSIBILITIES FOR
CONSERVATION OF NATURE AND ENVIRONMENT**

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ABSTRACT

Environmental ethics throws light on human relationships with nature. It encompasses the ethical relationship between humans and the environment, and the moral responsibilities of human beings for nature. To protect the environment is the absolute duty of human beings, which is very necessary for the better future of human existence. Humans are also an important part of the ecosystem, but being the most intellectually advanced living being, the worldly affairs of human beings are very large, which affects the other creatures of the ecological system. Often, we see that human beings have started to exploit the environment for the fulfilment of their present necessities without futuristic consideration, but they forget that the future of humans is only safe when the environment is safe, because they get all the primary resources for life from nature. e.g. air, sunlight, shelter, food, water, cloth, and raw material for home, and industrial setup, but today in this globalized era, humans have become careless in maintaining the balance with nature. The exploitation of natural resources is on the verge of the frivolous self-interest of human beings. Deforestation, water pollution, air pollution, and soil pollution are responsible for making the imbalance between nature and human beings, and can cause trouble for human existence. My research paper will discuss in detail the efforts of human beings which is necessary for the fulfillment of human responsibility towards nature and environmental preservation.

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Abstract No. 249

**INSECTICIDAL POTENTIAL OF SEED EXTRACTS OF
ANNONA RETICULATA L. (BULLOCK'S HEART):
A NATURAL SOURCE OF BIOACTIVE ACETOGENINS**

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ABSTRACT

Annona reticulata (Negro coffee), a member of the family Annonaceae, contains several bioactive phytochemicals known for their insecticidal potential. In the present study, seed extracts of the ethyl acetate fraction of *A. reticulata* were evaluated against the pulse beetle *Callosobruchus maculatus*, a major pest of stored pigeon pea. The insecticidal efficacy was dose-dependent: 5%, 10%, and 15% seed extract concentrations produced 34%, 55%, and 78% inhibition of *C. maculatus* growth, respectively. In addition to its toxic effects, *A. reticulata* also exhibited notable repellent activity, preventing adult *C. maculatus* from colonizing the treated seeds. These effects are attributed to acetogenins and other volatile secondary metabolites present in the seeds. The findings suggest that *Annona reticulata* seed extracts can serve as an effective herbal pesticide and may be incorporated into sustainable grain-storage practices.

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Abstract No. 250

**COMMUNITY LED WETLAND RESTORATION IN
MAHARASHTRA: POLICY, ETHICS, AND SDG
ALIGNED MITIGATION PATHWAYS**

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ABSTRACT

Wetlands in Maharashtra play crucial ecological, economic, and cultural roles by supporting fisheries, groundwater recharge, biodiversity conservation, and climate regulation. However, a combination of anthropogenic stressors including land-use conversion, chemical runoffs, invasive species expansion, and unmanaged waste has accelerated wetland degradation. While technical and regulatory interventions exist, long-term restoration success strongly depends on community engagement, ethical stewardship, and socio-ecological empowerment. This study examines community-led restoration initiatives in selected wetlands of the Godavari Basin and Marathwada region, analyzing stakeholder involvement, traditional ecological knowledge, governance structures, and policy gaps. The findings indicate that participatory monitoring, livelihood-linked incentives, and local decision-making councils significantly enhance ecological recovery and compliance. The work is aligned with SDGs 6 (Clean Water), 13 (Climate Action), 14 (Life Below Water), and 15 (Life on Land), emphasizing co-benefits for biodiversity and rural livelihoods. The proposed framework integrates low-cost biomonitoring, eco-ethical education, decentralized wetland governance, and climate-resilient habitat restoration strategies. The study underscores that sustainable wetland management is not merely a technical exercise but an ethical commitment to intergenerational environmental justice and community well-being.

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Abstract No. 251

**DIVERSE BRYOPHYTES- THE LILLIPUTS OF PLANT WORLD
FACED TRANSITION FROM AQUATIC TO LAND HABITAT**

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ABSTRACT

The bryophytes are considered as the first land plants which have been evolved from the aquatic ancestors. They are referred as cryptogams, archegoniate plants included in non-vascular embryophytes. They are the integral part of the nature as they play very important role in the eco-restoration of the denuded habitat. This varied group of little plants have demonstrated their significance as the pioneer communities during succession and proved their ecological contribution. Their plant body may be thallose having dorsiventral symmetry or they may be leafy forms having radial symmetry. Root system is absent, they lack any lignified vascular system but rhizoids are present for anchoring and absorption. Due to their small size they are neglected as compared to other plant groups having macroforms, as normal public watches them to grow on walls, on other trees in the moist surface hence identification problem arises. This communication emphasizes on the diversity among the miniature plant group of bryophytes.

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Abstract No. 252

**A STUDY OF THE GREEN CAMPUS INITIATIVE IN A
UNIVERSITY IN RELATION TO STUDENT'S ENVIRONMENTAL
AWARENESS AND BEHAVIOUR: A CASE STUDY**

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ABSTRACT

The Green Campus Initiative (GCI) at Khwaja Moinuddin Chishti Language University (KMCLU), Lucknow, represents a holistic model of sustainability in higher education, integrating policy frameworks, infrastructure development, curriculum innovation, and student engagement. Guided by the United Nations Sustainable Development Goals (SDGs) and the National Education Policy (NEP) 2020, the initiative seeks to embed environmental consciousness into institutional governance and everyday campus practices. This study employs a mixed-methods approach that integrates document analysis, quantitative impact assessment metrics, and a comprehensive evaluation of key indicators related to students' environmental awareness and behaviour. Findings reveal that KMCLU has implemented diverse sustainability measures, including afforestation drives, solar energy adoption, rainwater harvesting, biogas production, and comprehensive waste management systems. Curriculum integration through mandatory Environmental Studies and specialized courses in climate change, environmental law, and disaster management has significantly enhanced students' environmental literacy. Student-led organizations such as the Eco Club, NSS, and NCC further reinforce awareness through plantation drives, clean campus campaigns, and community outreach programs. Impact metrics demonstrate tangible outcomes, including the generation of 1,321 metric tonnes of oxygen annually, earning of 11.364 carbon credits, and substantial paper savings through eco-friendly examination practices. The study highlights that while KMCLU's GCI has successfully fostered environmental awareness and positive attitudes, translating these into sustained behavioural change remains a challenge, echoing findings from Knowledge-Attitude-Practice (KAP) models in other Indian universities. Comparative analysis underscores KMCLU's strength in monitoring and evaluation, positioning it as a leader in evidence-based sustainability management. Recommendations include expanding experiential learning, strengthening interdisciplinary collaboration, and enhancing infrastructure to deepen behavioural adoption. Overall, KMCLU's initiative exemplifies the transformative potential of higher education in advancing sustainability and shaping environmentally responsible citizens.

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Abstract No. 253

**ANTI-MICROBIAL ACTIVITY OF
DIFFERENT MEDICINAL PLANTS**

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ABSTRACT

Phytochemicals are bioactive substances derived from the different parts of plants. They are also known as secondary metabolites that play important role in the growth and development of plants and also involves in defense system. In this work we analyzed various types of phytochemicals present in the dry leaves and inflorescence of *Ocimum sanctum* and *Artemisia absinthium* by qualitative and quantitative analysis. The analysis is performed in three different types of samples i.e., methanol, ethanol and acetone. In the methanol extract the phytochemicals such as tannins, flavonoids, phenolic and glycosides are present in leaves of *Ocimum sanctum* and *Artemisia absinthium* while, Alkaloids are present only in leaves and inflorescence of *Artemisia* species. *Ocimum* leaves contain alkaloid but lack terpenoid. These phytochemicals show antioxidant, antitumor, diarrhea, anti-inflammatory, antiviral activities, antimutagenic activity. *Ocimum* leaves contains high amount of total phenolic content (TPC) and total flavonoid content (TFC) as compared to *Artemisia* leaves. But for Inflorescence, high TPC and TFC are present in *Artemisia* than *Ocimum*. Comparison of non-volatile compound present in leaves and inflorescence of *Ocimum* are analyzed by GC-MS. The extract of leaves of *Ocimum sanctum* show high antimicrobial activity against *Bacillus subtilis* than *Pseudomonas putida* but its inflorescence shows high activity against *pseudomonas putida*. The leaves and inflorescence of *Artemisia* show high antimicrobial activity against *Pseudomonas putida*.

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Abstract No. 254

**AMELIORATION OF NDEA-INDUCED HEPATIC STRESS BY
BETA-CAROTENE: A BIOCHEMICAL AND MECHANISTIC
EVALUATION IN *CHANNA PUNCTATUS***

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ABSTRACT

A powerful hepatotoxin that causes oxidative stress-mediated liver damage in aquatic creatures is N-nitrosodiethylamine (NDEA). NDEA is an effective carcinogen and mutagenic substance. In this study, the hepatoprotective efficacy of dietary antioxidant β -carotene against NDEA-induced liver damage in freshwater fish *Channa punctatus* is evaluated. Carotenoids, including β -carotene, are organic substances widely distributed in plants, serving as the primary source of vitamin A and possessing numerous immunological and antioxidant properties. The most prevalent pigment found in many nutritious crops is β -carotene, which is also present in carrots, papaya, spinach, pumpkin, and others. Fish were divided into four groups: control, NDEA-treated, β -carotene-treated, and NDEA + β -carotene co-treated. A single dose of NDEA increased the level of LPO and reduced the levels of SOD and CAT. It decreased the increased levels of total protein. Histopathological alteration and immunohistochemistry (IHC) of liver tissue were examined following sacrifice after two weeks. After treatment, NDEA Liver and Kidney became damaged. The results suggest that Beta-Carotene inhibits hepatic toxicity in freshwater fish *Channa punctatus*.

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Abstract No. 255

**RAISING COMMUNITY AWARENESS ON ENVIRONMENTAL
ETHICS AND HUMAN RESPONSIBILITIES**

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ABSTRACT

In the face of escalating environmental challenges such as pollution, deforestation, climate change, and loss of biodiversity, fostering a deep sense of environmental ethics and human responsibility has become essential. Environmental ethics provides a moral framework for guiding human behavior toward nature, emphasizing respect, care, and sustainable interaction with the environment. This research aims to raise community awareness on environmental ethics and human responsibilities by promoting education, behavioral change, and active participation in conservation practices. The study focuses on developing and implementing community-based programs that encourage individuals to adopt eco-friendly habits and take collective action for environmental protection. It employs awareness campaigns, environmental workshops, and participatory activities such as tree plantation drives, waste management initiatives, and local biodiversity conservation projects. Data will be collected through surveys, interviews, and observations to assess changes in community knowledge, attitudes, and behaviors before and after the awareness programs. The findings are expected to highlight the effectiveness of ethical and educational interventions in improving public perception and engagement toward environmental stewardship. By fostering moral and practical responsibility toward nature, this study aims to create an informed and environmentally conscious community that upholds the principles of sustainability, equity, and intergenerational justice. Ultimately, it contributes to building a harmonious relationship between humans and the natural world.

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Abstract No. 256

**NANOCOMPOSITE NANOFIBROUS WEB WITH STABLE 3D
HIERARCHICAL SCAFFOLDS FOR WATER PURIFICATION**

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ABSTRACT

2D electrospun free-standing nanofibrous mats of polyethylene terephthalate (PET) with 67427 g/mol molecular weights were used to study the properties of basic foundation units. The mean diameter of pristine and nanocomposite electrospun nanofibers was estimated to be 165 and 225 nm for the addition of 1.0 weight percentages of nanofillers, respectively using the Image J processing software. 3D highly porous architectures with tailored flexibility along with dimensional stability are currently an emerging area due to a wide range of technological applications. In this study we have highlighted here the importance of the building blocks and interfacial bonding for development of such NHSK scaffolds. The nanohybrid shish-kebab (NHSK) type polycaprolactone (PCL) crosslinked networks were grown between the stacked nanofibrous mat for better bindings among the layers. Carbon nanotubes were further introduced into PET nanofibers as well as in binder envelop layers in order to insight into the morphological properties of nanofibrous web. The presence of different confined 1D nucleating surface like nanotubes and nanofibers gives us the opportunity to study interpenetrating NHSK lamellae at different length scale. A range of cross linked scaffold microstructures by origami route was investigated to highlight the importance of process design for fabrication of dimensionally robust porous geometries.

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Abstract No. 257

**PHYTOREMEDIATION: A NOVEL APPROACH
FOR ENVIRONMENTAL CLEAN-UP**

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ABSTRACT

Phytoremediation is an integrated approach for remediation of contaminated soil and water using plants. Phytoremediation is comprised of two components, one by the root colonizing microbes and the other by plants themselves, which degrade the toxic compounds. Various compounds, viz. organic compounds, xenobiotics, volatile compounds, pesticides and heavy metals, are among the contaminants that can be effectively remediated by plants. Plant cell cultures, hairy roots and algae have been studied for their ability to degrade a number of contaminants. They exhibit various enzymatic activities for degradation of xenobiotics, viz. dehalogenation, denitrification leading to breakdown of complex compounds to simple and non-toxic products. Plants and algae also have the ability to hyper accumulate various heavy metals by the action of phytochelatins and metallothioneins forming complexes with heavy metals and translocate them into vacuoles. Molecular cloning and expression of heavy metal accumulator genes and xenobiotic degrading enzyme coding genes resulted in enhanced remediation rates, which will be helpful in making the process for large-scale application to remediate vast areas of contaminated soils. Selection and testing multiple hyperaccumulator plants, protein engineering of phytochelatin and membrane transporter genes and their expression would enhance the rate of phytoremediation, making this process a successful one for bioremediation of environmental contamination. The details experimental approach of phytoremediation will be discussed with a focus on future trends and prospects of global relevance as environmental clean-up.

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Abstract No. 258

**ANALYSIS OF ENVIRONMENTAL
LAWS IN INDIAN INDUSTRIES**

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ABSTRACT

India is developing country having very rich natural resources ; no doubt it has its own shore of environmental problem arising out of unsustainable development . Many people think that environmental problems are for the other people and the government has to do something about environmental responsibility which starts with each and every of us. In India and other countries following the common law system, court decisions are significant. The decision of the higher courts namely the Supreme Court and the high court order, are binding on the lower courts. Among laws, there are some general laws and special laws. There are three Environmental (Protection) Act, 1986 of our interest is a general where as the Air (Prevention and Control of Pollution), Act 1981 and the water (Prevention and Control of Pollution) Act 1974, 1987 are special laws. Environmental laws should be firmly implemented. It is quite often mistaken not to integrate environmental consideration for industrial operation. In some cases legislative compliance is obstructing and becoming a hurdle in the smooth production or development process , while some industries just "deal with trouble as it comes", other industries merely try to do the minimum, the most successful companies "manage for Environmental protection". The government rules/laws follows by all people to control the pollution.

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Abstract No. 259

**ADOPTION OF CLIMATE-RESILIENT AGRICULTURAL
TECHNOLOGIES AND PRACTICES IN HAMIRPUR OF
UTTAR PRADESH: BARRIERS, OPPORTUNITIES AND
POLICY IMPLICATIONS**

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ABSTRACT

Adoption of climate resilient agricultural practices and technologies is key to the sustainability of agricultural productivity particularly in areas such as Hamirpur, Uttar Pradesh that are prone to climate change and high weather conditions. This paper seeks to discuss the obstacles, the opportunities, and the policy implications that are related to the use of climate-resilient technologies by farmers in Hamirpur. Low irrigation rates and rainfed farming are some of the features of the district, which is quite problematic due to drought, unpredictable rainfall, and soil erosion that endanger the yields and lives of farmers. Based on field survey, interviews with farmers, and consultation with agricultural experts, this study determines some of the major obstacles to the introduction of climate-resilient practices: financial situation, ignorance, inappropriate access to technology, and insufficient support of extension services. Also, the study investigates the potential of these technologies to enhance water-use efficiency, soil health and crop stress to climate. The research also considers how the government policies including subsidies, insurance plans, and extension services can help to increase the adoption of these technologies. The paper has offered specific policy solutions to address the barriers and motivate farmers to become climate-resistant based on the findings. They are extension services, greater access to affordable technology, better education of farmers on the dangers of climate change, and the development of more resilient insurance and subsidy systems. This research will give information to the policymakers, agricultural agencies and other stakeholders on how they can develop strategies that will help in the sustainable agricultural development in Hamirpur.

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Abstract No. 260

**SUSTAINABLE NATURAL RESOURCES AND
AGRICULTURAL TRANSFORMATION IN MAU DISTRICT**

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ABSTRACT

This study examines the relationship between natural resource sustainability and agricultural transformation in Mau district, located in eastern Uttar Pradesh, India. Being an agrarian region, Mau depends greatly on the quality of soil, water, biodiversity, and climate. Although the district has fertile alluvial soil, moderate rainfall, and suitable temperature for diverse crops, increasing pressure from monocropping and heavy use of chemical inputs has led to the degradation of natural resources in recent decades. The findings show a clear decline in soil fertility due to continuous wheat–rice cropping, excessive chemical fertilizers, and reduced organic matter. Falling groundwater levels, irregular rainfall, and low recharge rates have further intensified irrigation problems. In addition, the dominance of small and marginal farmers limits the adoption of modern technologies, micro-irrigation, and improved resource-management practices. The study emphasizes that crop diversification—through pulses, oilseeds, vegetables, and horticultural crops—improves soil health and increases farmers' income by 20–25%. Organic farming also emerges as an eco-friendly and sustainable option, reducing production costs and enhancing soil and water conservation while opening new market opportunities. These observations support the United Nations Sustainable Development Goals (SDGs), particularly SDG-2, SDG-12, and SDG-13, which promote food security, responsible resource use, and climate action. The study concludes that coordinated efforts involving scientific resource management, policy support, water-saving technologies, community participation, and farmer training can make agriculture in Mau district more resilient, productive, and sustainable. With such measures, the district can become a model of sustainable agricultural development.

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Abstract No. 261

**BACTERIOLOGICAL EXAMINATION OF TAMSA
RIVER WATER FOR FECAL CONTAMINATION**

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ABSTRACT

A study was carried out to disclose the aspect of fecal contamination of Tamsa river water by sampling at four (S1,S2,S3,S4) stations spread throughout the city. The river TAMSA is flowing in mid of Azamgarh city from west to east in horse's shoe shaped. Human interaction has always posed a threat to the flora and fauna supported by river. Presumptive coliform count for estimation of coliform bacilli in the water sample was carried out. Result obtained, on 24, hours incubation at 37°, were compiled for the maximum MPN. The observation revealed incidence of coliforms by presumptive positives in every sampling stations with highest number at S3. The region could be attributed mainly to the direct fecal contamination by human, city wastes, wallowing buffaloes and wastes by nearby riparian sites of the river.

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Abstract No. 262

**COMMUNITY PERSPECTIVE ON LIVELIHOOD
IN FLOOD DISASTER IN UTTAR PRADESH**

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ABSTRACT

Floods are a frequent disaster in Uttar Pradesh, which deeply impacts the livelihoods of both rural and urban areas. Solutions and management from a community perspective are based on local experience, traditional knowledge and community-based collaboration. Huge loss to agriculture: Crops are destroyed, which reduces the income of farmers. Livestock loss: Livestock at risk due to lack of fodder, water and shelter. Labor opportunities decrease: Daily wage laborers are unable to find work. Economic loss is caused due to flooding of shops and local businesses. Village committees, self-help groups (SHGs), youth circles and farmer groups play an active role in risk reduction. Building shelters for animals on elevated platforms collective storage of grains and fodder. Alert system should be at local level by community. Community management of emergency services like boats, ropes, food distribution is must. Evacuating the weak, elderly and women to safe places and cleaning of roads and fields through collective labor donation are needed. Livelihood restoration by providing small loans through SHGs and adoption of alternative crops and new technologies in agriculture are significant. Promotion of flood tolerant crops (paddy, pigeon pea, sweet potato). Options like fish farming, goat farming, and beekeeping. Promotion of handicrafts and domestic industry, collective participation in schemes like MNREGA is helpful. Disaster Management Department, Panchayat and community jointly carry out relief work. Emphasis should be given on community training, awareness and capacity building, alerts, weather information and information on plans from digital platforms and mobile groups.

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Abstract No. 263

**ROLE OF GOVERNMENT CLIMATE POLICIES IN
PROMOTING ECO-FRIENDLY BUSINESS PRACTICES IN U.P.**

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ABSTRACT

This study examines the role of government climate policies in promoting eco-friendly and sustainable business practices in Uttar Pradesh. Over the past decade, the Government of India has introduced several climate-focused measures such as renewable-energy promotion, pollution-control regulations, green-tax reforms, and waste-management guidelines. These policy initiatives aim to protect the environment while encouraging businesses to adopt cleaner, more responsible, and resource-efficient methods of production. The study highlights how such policies help businesses reduce energy consumption, lower operational costs, minimize pollution, and increase long-term sustainability. It also explores the opportunities created for green industries such as solar energy, recycling systems, organic products, and sustainable packaging. Using secondary data obtained from government documents, policy reports, and published research, the study provides a descriptive and analytical understanding of how climate policies influence business behaviour. The findings indicate that government regulations play a crucial role in encouraging industries to shift toward cleaner technologies and eco-friendly practices. Although small and medium enterprises face challenges such as limited awareness and initial investment costs, the overall impact of climate policies remains positive. These policies not only support environmental protection but also strengthen India's transition toward a green economy by linking climate responsibility with commercial growth.

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Abstract No. 264

**TRENDS IN FISH COMMUNITY COMPOSITION IN
THE RIVER RAPTI, UTTAR PRADESH, INDIA**

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ABSTRACT

From 2023 to 2025, monthly monitoring of fish catches was undertaken at five major sites along the River Rapti in the Balrampur region of Uttar Pradesh. The fish assemblage was dominated by species of diverse size classes that predominantly exhibited periodic life-history traits. These included several catfish and carp species known for features such as seasonal spawning and high reproductive output. Throughout the study period, annual fish yields showed noticeable fluctuations, with an overall tendency to decline. Multivariate statistical analyses indicated that changes in species composition were closely linked to seasonal hydrological patterns. Fish production was generally higher in years when monsoon flooding persisted for longer durations, suggesting the importance of extended flood regimes for sustaining fisheries. Variations in mean stock yields and year-to-year yield stability were closely related to the species' life-history traits; species that were most common and showed the least fluctuation in catches were those with periodic strategies, characterized by seasonal breeding, high fecundity, small eggs, and lack of parental care. This reduced performance is likely tied to multiple stressors, particularly persistent heavy fishing pressure and other human-induced disturbances.

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Abstract No. 265

**A REVIEW ON DIVERSITY OF AQUATIC FAUNA AND
THEIR ROLE IN MAINTAINING HEALTH OF
WETLAND'S ECOSYSTEM**

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ABSTRACT

Wetlands are the important area that supports rich biodiversity. The health of wetland's ecosystem is determined by physical, chemical and biological factors. The biological factor includes all living animal and plant species which are dependent to each other for material and energy. The main aquatic fauna of wetlands are fishes, amphibians and some reptiles. The aquatic fauna are the key species in maintaining the health of wetlands ecosystem as they play as a connecting link between producers and top consumers. The birds and mammals rely on aquatic fauna for their food sources. Habitat destruction and degradation due to urbanization, change in land-use pattern, pollution from the use of chemical fertilizers, pesticides and insecticides in agriculture, industrial and domestic wastes, invasive species and over-exploitation of wetland resources such as soil, water, plants and animal species (overfishing and poaching of animals) are the major threats to aquatic fauna of wetlands. In recent years, aquatic fauna of wetlands are gradually declining. So, it is essential to conserve aquatic life for maintaining the health of wetland's ecosystem.

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Abstract No. 266

**FOREST BOUNDARY DIGITIZATION AT CADASTRAL LEVEL
AND FOREST STOCK MAPPING OF MALPURVI BEAT,
LUCKNOW USING GEOSPATIAL TECHNIQUES**

Nishchal Kumar Sharma, Anil Kumar and Rudra Pratap Singh

Department of Environmental Sciences
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ABSTRACT

Forest Boundary digitization at cadastral level involves the process of converting physical boundaries into digital or electronic format. This is typically done using Geographic Information System (GIS) and Remote Sensing (RS) technology. By digitizing the boundaries, we can create accurate and precise maps of forest areas. The study aims to estimate the forest type and density of (Kolwa and Khakhra ForestBlock) Malpurvi Beat, Lucknow using geospatial techniques. The creation of forest type maps requires the use of geospatial data, which can be handled using an image classification technique. While image identification and recognition work to find and identify specific objects or features in digital images, unsupervised classification assigns groups of forest type to individual pixels. For this work, an unsupervised classification-based approach was employed, which involved classifying a large number of unknown pixels according to their reflectance values and interpreting the images using image processing software. The goal of image classification is to locate and depict each feature in an image as a distinct gray scale (or color) that corresponds to the object or kind of forest that the feature represents on the ground. Using Arc GIS 10.8 software, the Google Earth image was categorized into 15 classes; further refinements have been done.

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Abstract No. 267

**APPLICATION OF AGRO-BASED BIOCHAR FOR REMOVAL
OF ORGANIC AND INORGANIC WATER POLLUTANTS**

Akanksha Yadav, Naveen Patel and Vinod Kumar Chaudhary

Department of Environmental Sciences
Dr. Rammanohar Lohia Avadh University, Ayodhya (U.P.), India

ABSTRACT

Agricultural-based biochar (Ag-BC) has gained enormous attention around the globe because of its effective and sustainable material for cleaning polluted water. Made from widely available agricultural wastes, Ag-BC is affordable, environmentally friendly, and offers useful properties such as a porous structure and adjustable surface chemistry. However, using raw biochar alone often comes with drawbacks its surface properties can vary, and it may not always remove pollutants efficiently. This review provides an overview of recent research on how agricultural-based biochar and its modified forms are produced, how their structures and properties can be improved, and how effectively they remove different types of pollutants. It explains key mechanisms involved in the removal of both inorganic contaminants like heavy metals and nutrients and organic pollutants such as dyes, pharmaceuticals, and other emerging chemicals. While modified Ag-BC materials show strong potential for treating polluted water, questions still remain about their long-term stability, environmental impacts, and how easily they can be regenerated or reused. At the conclusion of this review, future directions for the synthesis and application of BC and BC-based materials were presented. This review will assist new researchers in thoroughly understanding the research progress of BC and BC-based composite materials in environmental remediation.

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Abstract No. 268

**GREEN SYNTHESIS OF METALLIC NANOPARTICLES
USING BIOMASS FEEDSTOCK FOR SUSTAINABLE
ENVIRONMENTAL APPLICATIONS**

**Yogesh Kumar Shukla, Priyansh Pandey, Janardan Prasad Pandey,
Jitendra Kumar and Alok Shukla**

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ABSTRACT

The growing concern over environmental pollution and the limitations of conventional physicochemical synthesis routes have spurred interest in green nanotechnology. This study explores the sustainable synthesis of metallic nanoparticles using renewable biomass feedstocks such as plant extracts, agricultural residues, and microbial byproducts. These biological precursors act as reducing and stabilizing agents, eliminating the need for hazardous chemicals and minimizing ecological impact. Characterization techniques such as UV-Vis spectroscopy, X-ray diffraction (XRD), scanning electron microscopy (SEM), and Fourier-transform infrared (FTIR) spectroscopy confirmed the formation, crystallinity, and functional groups responsible for stabilization of the nanoparticles. The synthesized nanoparticles exhibited excellent photocatalytic, antibacterial, and adsorption properties, demonstrating their potential in wastewater treatment and pollutant remediation. This work highlights the integration of green chemistry principles with nanotechnology to develop cost-effective, eco-friendly, and scalable solutions for environmental sustainability.

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Abstract No. 269

**ADSORPTION OF METHYLENE BLUE (MB) DYE
BY USING AGROWASTE OF CAULIFLOWER**

Ansil Singh, Naveen Patel and Vinod Kumar Chaudhary

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ABSTRACT

Industrial dye pollution, as Methylene Blue (MB), causes serious environmental and health risks due to its stability and toxicity. This study examines the potential of cauliflower agrowaste-derived biochar, activated using a combination of FeCl_3 and AlCl_3 , as a low-cost and sustainable adsorbent for MB removal from aqueous solutions. Batch adsorption experiments were conducted under varying conditions to determine the efficiency of the prepared biochar. The adsorption performance was evaluated across a pH range of 2 to 10, adsorbent doses of 2 to 10 mg/L, and contact times from 15 minutes to 3 hours. The results exposed that MB removal efficiency ranged from 36.56% to 71.96%, indicating strong adsorption capability under optimized conditions. Overall, the study highlights cauliflower agrowaste as a promising, eco-friendly material for wastewater treatment and promotes the enhancement of agricultural residues as effective adsorbents in dye remediation.

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Abstract No. 270

**APPLICATION OF DISPERSION MODEL OF AIR POLLUTANT
IN INDUSTRIAL AREAS FOR THE MANAGEMENT
OF AIR POLLUTION**

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ABSTRACT

Air pollution is the growing concern in the world due to its harmful impact on human health and environment. Various sources of air pollutants are industrial, vehicular, household, and agricultural activities along with natural sources like forest fires, volcanic eruptions etc. Apart from these sources industrial emission is very important on account of large amount of air pollutants release at one time. These sources emitted huge amount of air pollutants such as $PM_{2.5}$, PM_{10} , oxides of sulphur, oxides of nitrogen, carbon monoxide, volatile organic compounds (VOCs) etc. in the nearby area due to dispersion. Due to this, management of air pollutants in industrial area there are various models like AERMOD, CALPUFF, ADMS, ISCST3, CFD etc. play a crucial role in many pre industrial activities like environmental impact assessment (EIA), dispersion of air pollutants from sources, and impact of air pollutants on human health in nearby area. This article will describe the application of AERMOD model for the management of air pollution from industrial emission sources. Moreover, the usefulness of air quality dispersion modeling along with key features of the AERMOD software and even the types of input data needed to run the model, are also addressed.

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Abstract No. 271

**MATHEMATICAL MODELLING OF BLOOD-BASED
NANOFLUIDS UNDER MAGNETIC FIELDS AND
RADIATION EFFECTS WITH ENVIRONMENTAL
SUSTAINABILITY PERSPECTIVE**

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ABSTRACT

The numerical modelling and simulation of blood-based nanofluids not only enhance the understanding of biomedical transport phenomena but also offer a critical environmental and societal perspective. With the rapid growth of nanotechnology-driven drug delivery platforms, the release, accumulation, and disposal of nanoparticles in natural ecosystems have become a major global concern. Gold and titanium oxide nanoparticles used in medical applications can ultimately enter soil, air, and water through biomedical waste and biological discharge, which may disturb ecological balance, affect agricultural food chains, alter water quality, and pose new challenges to public health safety. Therefore, mathematically evaluating their thermal transport, morphological behaviour, and interactive dynamics is essential in order to predict, control, and minimise unintended nanotoxicity. Additionally, modelling blood-based nanofluids under magnetically driven and radiative energy fields indirectly contributes to society by enabling better clinical translation, safer medical applications, reduced ecological footprint of medical nanotechnology, and protected community health. Radiation assisted thermal enhancement, shape induced thermal modification, and energy absorption efficiency directly connect to global thermal systems where heat conversion, sustainable energy management, and eco-responsible technological development are crucial for long-term environmental and societal wellbeing.

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Abstract No. 272

**ADVANCED WASTE CONVERSION
TECHNOLOGIES FOR CLEAN ENERGY**

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ABSTRACT

The rapid rise in industrial, municipal and agricultural waste has intensified the need for sustainable disposal methods that also contribute to clean energy generation. Advanced waste conversion technologies are emerging as a promising approach to address both challenges simultaneously and they offer an integrated solution by transforming diverse waste streams in to valuable energy carriers such as heat, electricity, biofuels, biogas, and syngas. These technologies not only reduce land fill dependency and greenhouse gas emissions but also support the transition toward a circular economy, where waste is treated as a valuable resource. Technologies including pyrolysis, gasification, anaerobic digestion, plasma arc treatment and refuse-derived fuel systems are emerging as effective substitute to conventional land filling and incineration. These processes operate with higher efficiency, foot prints, reduced emission, and enhanced resource recovery potential. Their adaptability to various feed stocks and compatibility with crucial economy frameworks make them crucial in modern waste management. Ultimately, advanced waste conversion technologies present a promising pathway toward sustainable energy transitions and responsible waste stewardship.

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Abstract No. 273

**APPLICATION OF MAIZE CORN COB DERIVED
BIO-ADSORBENT FOR REMOVAL OF PARACETAMOL
FROM AQUEOUS SOLUTION**

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Dr. Rammanohar Lohia Avadh University, Ayodhya (U.P.), India

ABSTRACT

Paracetamol (N-(4-hydroxyphenyl) acetamide), also known as acetaminophen, is one of the most widely used analgesic and antipyretic worldwide. Due to its high stability, solubility and hydrophilicity it has been detected in surface waters, wastewater and drinking water throughout the world that requires mitigation and remediation strategies. The aim of the present study was to analyse the removal of the paracetamol from aqueous solutions using the Bio-Adsorbent. For this Maize Corn Cob Derived Bio-Adsorbent with different textural properties was used. A series of batch adsorption experiments were conducted at different values of pH (2.0,4.0,6.0,8.0 & 10.0) along with this different dose of adsorbent (1 to 8 g/l) and contact time also studied to investigate the effects on the removal of paracetamol from the aqueous solution. The maximum adsorption capacity of developed bio-adsorbent was found at 6 g/l and contact time of 5 hrs. Adsorption was found to be higher in the acidic pH range, as varying pH showed significant influence on the surface charge of the adsorbents and degree of ionization of the paracetamol.

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Abstract No. 274

**ASSESSMENT OF ATMOSPHERIC PARTICULATE
MATTER (COARSE AND FINE) IN URBAN
RESIDENTIAL AREA OF AYODHYA CITY, (U.P)**

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ABSTRACT

According to The United Nations statistics report about 55% of the Asian population lives in metropolitan areas. Air pollution is the most concerning factor for environmentalists and decision-makers due to its detrimental influence on human health. Air pollutants comprise of gases, liquids, and particulate matter. Particulate matter having aerodynamic diameter the different characteristics of the particles in the atmosphere have proved that mixture of chemical, sand particle size, distribution are crucial to determine the health impacts, biological responses, and climate effects. The study was carried out between June to November 2025. Ambient air samples were collected at central instrumentation facility building of Dr Rammanohar Lohia Avadh University. For the sampling of particulate matter respirable dust sampler and fine particulate sampler were used. Coarse and fine particulate Matter were collected on the filter paper made up of glass fiber filter paper for coarse particle where as PTFE filter paper for fine particles. Lowest concentration of coarse and fine particulate matters (83.51 ± 16.95 & 22.97 ± 4.94) was observed in the month of September while maximum concentration was observed in the month of November (250.00 ± 30.20 & 120.00 ± 15.12).

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Abstract No. 276

**EFFECT OF PLASTIC WASTES ON HUMAN HEALTH,
ENVIRONMENT AND ITS MANAGEMENT**

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ABSTRACT

Plastic is a kind of material that is commonly well known and used in everyday life in many forms. Plastic pollution where in plastic has gathered in an area and has begun to negatively impact the natural environment and create problems for plants, wildlife and even human population. Of ten this includes killing plant life and posing dangers to local animals. Plastics contain many chemical and hazardous substances such as Bisphenol A (BPA), thalates, antiminitroxide, brominated flame retardants, and poly- fluorinated chemicals etc. which are a serious risk factor for human health and environment. Different human health problems like irritation in the eye, vision failure, breathing difficulties, respiratory problems, liver dysfunction, cancers, skin diseases, lungs problems, headache, dizziness, birth effect, reproductive, cardiovascular, genotoxic, and gastrointestinal causes for using toxic plastics. Use of plastics causes serious environment pollution such as soil pollution, water pollution, and air pollution. Application of proper rules and regulations for the production and use of plastics can reduce toxic effects of plastics on human health and environment. Plastics associated human health risks, evidence abounds for plastics' potential to pollute and disrupt important natural processes and quality of life and its continued use at accelerating rates is unsustainable and will cause a significant burden for future generations. As plastic and plastic products are being used in day to day at the cost of environment pollution, the human and wildlife health and has become a global concern. Public should be educated about the use of plastic and plastic products which can prove to be hazardous and risk factor to many health problems of human and wild life. Hence there is an urgent need to look for biodegradable measures and effective policies and their implementation.

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Abstract No. 277

**ROLE OF LIBRARY IN CURBING
THE IMPACT OF CLIMATE CHANGE**

Pankaj Kumar Singh

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ABSTRACT

Climate change is a new challenge the whole of mankind is faced with today. Curbing its negative impact on the life of the people of the world is one of the major goals of Sustainable Development Goals (SDG). Library personnel can contribute to preventing climate change by spreading awareness among the people of society by telling them the do's and don'ts in order to create an ecological balance. They can motivate students to plant more and more trees and make a minimal use of papers so that not many trees are cut down unnecessarily. They can organise Environment Awareness Programmes on campus as well as at other places of society for the benefit of all kinds of people. The present paper aims to discuss how libraries can play a pivotal role in curbing climate change and its negative impact on society.

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Abstract No. 278

**UTILIZING RENEWABLE NATURAL RESOURCES
IN THE GREEN SYNTHESIS OF NANOCARRIERS:
ENSURING FOOD AND HEALTH SAFETY**

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ABSTRACT

Green synthesis techniques in nanotechnology are becoming more popular due to the increasing need for environmentally friendly and sustainable solutions. Nanocarriers for food and health safety applications may be green synthesised with the use of renewable natural resources such as agro-wastes, plant extracts, and biopolymers. Traditional approaches to fabricating nanocarriers often include harmful chemicals and high-energy procedures, endangering both ecosystems and human well-being. To the contrary, green synthesis makes use of naturally occurring stabilizing and reducing agents to reduce the production of harmful by-products while preserving the desired physicochemical characteristics. The biogenic nanocarriers that are created using this method have better stability, controlled release capabilities, and are more biocompatible, making them ideal for encasing pharmacological agents, nutraceuticals, and bioactive substances. Their use in antimicrobial packaging, targeted medicine administration, and food preservation has a double benefit: it improves human health and preserves the environment simultaneously. In addition, the SDGs that deal with human health, ethical consumption, and environmental conservation are all in line with the incorporation of renewable natural resources. The use of green nanocarrier technology represents a watershed moment in the fight for sustainable healthcare and food systems; it bolsters the idea of a circular bioeconomy that brings together innovation in technology and environmental protection.

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Abstract No. 280

**ASSESSMENT OF CARBON SEQUESTRATION
POTENTIAL OF WETLANDS IN AYODHYA USING
REMOTE SENSING AND THE IN VEST MODEL**

**Suraj Prakash Yadav, Mahima Chaurasia,
Vinod K. Chaudhary and Sanjeev K. Srivastava**

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Dr. Rammanohar Lohia Avadh University, Ayodhya (U.P.), India

ABSTRACT

The ongoing decline of essential natural ecosystems, such as wetlands and forests, plays a significant role in the escalating complexities of climate change. These ecosystems are crucial for the seamless functioning of vital cycles that facilitate the continuous flow of essential elements of life in our environment, including air, water, and soil. Breaking the cycle of climate change has proven to be a formidable challenge. This study underscores the critical need for carbon sequestration and the conservation of both formal and informal wetlands in and around the Ayodhya district. Given the rapid development in Ayodhya over recent years, it is increasingly important to recognize wetlands as intricate ecosystems that support a diverse range of plants and aquatic organisms, contribute to soil conservation, store organic carbon, and enhance urban sustainability. In this research, key wetlands covering significant areas have been identified primarily using satellite data. Through the application of In VEST model following land use and land cover classification, we have calculated the carbon sequestration potential associated with these vital wetland areas.

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Abstract No. 281

**MOBILE BANKING AND MICROFINANCE
INCLUSION FOR RURAL WOMEN**

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ABSTRACT

Mobile banking has emerged as a transformative tool for enhancing microfinance inclusion among rural women, who have historically faced significant barriers to accessing formal financial services due to geographic isolation, limited banking infrastructure, and socio-cultural constraints that restrict their economic participation. This study examines how mobile banking platforms facilitate microfinance access by reducing transaction costs, eliminating the need for physical branch visits, and enabling women to conduct financial transactions discreetly and conveniently. Through a mixed-methods approach combining quantitative surveys and qualitative interviews with rural women microfinance beneficiaries, the research analyzes adoption patterns, usage behaviors, and perceived benefits of mobile banking services. Key findings reveal that mobile banking significantly increases women's financial autonomy by providing direct access to loans, savings accounts, and repayment facilities without intermediary dependencies; however, challenges persist, including digital literacy gaps, inadequate mobile network coverage, smartphone affordability, and resistance from male family members who control technology access. The study also identifies that successful mobile banking adoption requires comprehensive digital literacy training, vernacular language interfaces, and community-based support systems to overcome these barriers. The research contributes to understanding how technology-enabled microfinance can empower rural women economically and socially while highlighting critical implementation barriers that policymakers, microfinance institutions, and fintech companies must address through gender-sensitive mobile banking designs, strengthened digital infrastructure in rural areas, and targeted financial literacy programs to leverage mobile technology for inclusive rural development and women's economic empowerment.

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Abstract No. 282

CLIMATE CHANGE AND MITIGATION STRATEGIES

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ABSTRACT

This abstract outlines a critical examination of the multifaceted relationship between accelerating climate change, diverse mitigation strategies, and their profound implications for human well-being, particularly within the Indian context. It highlights the urgent need for integrated approaches that address both environmental sustainability and social equity. The escalating global climate crisis poses an existential threat, manifesting through rising temperatures, extreme weather events, and sea-level rise. These environmental shifts have far-reaching socio-economic consequences, impacting public health, food security, livelihoods, and displacement across the globe. Understanding the intricate dynamics of these changes is paramount to formulating effective and equitable responses. India, with its vast coastline, dense population, and reliance on climate-sensitive sectors like agriculture, stands as one of the most vulnerable nations to climate change impacts. The country faces heightened risks from erratic monsoons, heat waves, water scarcity, and coastal inundation, disproportionately affecting its most marginalized communities. Addressing these vulnerabilities requires a comprehensive strategy that not only mitigates emissions but also strengthens adaptive capacities and promotes sustainable development pathways tailored to local contexts.

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Abstract No. 283

**BIOMETRICAL CHARACTERIZATION AND MORPHOLOGICAL
DIVERSITY ASSESSMENT OF TWENTY-FIVE HYBRID
TEA ROSE VARIETIES**

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ABSTRACT

This study presents a comprehensive biometrical analysis of 25 hybrid tea rose varieties to assess morphological variation and identify distinguishing characteristics for cultivar differentiation. Biometrical parameters were systematically evaluated across vegetative and reproductive structures including plant height, stem diameter, internode length, leaf dimensions, leaflet number, petal count, flower diameter, bud length, and flower weight. Statistical analyses revealed significant variation among varieties for all measured traits, indicating substantial genetic diversity within the hybrid tea rose germplasm. Plant height ranged from 68.4 cm to 142.6 cm, while stem diameter varied from 6.2 mm to 11.8 mm. Flower diameter exhibited considerable variation (7.8 cm to 14.2 cm), with petal count ranging from 26 to 58 petals per flower. Individual flower weight ranged from 8.4 g to 18.7 g, while bud length varied between 3.2 cm and 6.8 cm. Leaf parameters showed significant diversity, with leaf length (8.6-15.4 cm), leaf width (3.2-6.4 cm), and leaflet number (5-9 per leaf) differing substantially among varieties. Internode length ranged from 4.8 cm to 8.6 cm across varieties. Correlation studies demonstrated positive associations between stem diameter and flower size ($r = 0.78$), suggesting vigorous vegetative growth contributes to larger blooms. Principal component analysis identified flower-related traits as primary contributors to overall variation, with the first three components explaining 72.4% cumulative variance. Cluster analysis grouped varieties into four distinct morphological classes based on Euclidean distances. Varieties 'Double Delight' and 'Peace' displayed superior flower dimensions (13.8 cm and 14.2 cm diameter respectively), while 'Crimson Glory' exhibited maximum petal count (58 petals). The study establishes standardized biometrical descriptors facilitating accurate cultivar identification and provides valuable baseline data for breeding programs targeting improved ornamental qualities in hybrid tea roses.

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Abstract No. 284

**STUDY ON THE DIVERSITY OF INSECT FAUNA IN
SELECTED AREAS OF BALRAMPUR, U.P., INDIA**

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ABSTRACT

The present study investigates the diversity, distribution, and ecological significance of insect fauna in selected areas of Balrampur district, Uttar Pradesh, India. Insects, being the most species-rich group of terrestrial organisms, serve as vital indicators of environmental health and ecosystem stability. Surveys were conducted across varied habitats including agricultural fields, wetlands, grasslands, and peri-urban zones. Standard entomological methods such as sweep netting, pitfall trapping, and light trapping were employed to document species richness and abundance. Preliminary analysis revealed a high diversity of insects representing major orders such as Coleoptera, Lepidoptera, Hymenoptera, Hemiptera, Odonata, and Orthoptera. Variations in diversity were closely associated with habitat type, vegetation structure, and microclimatic conditions. The study highlights the ecological value of local habitats and underscores the need for biodiversity conservation strategies in Balrampur. These findings contribute baseline data for future ecological assessments and conservation planning in the region.

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Abstract No. 285

**CLIMATE CHANGE: PERSPECTIVES TO PARASITIC
DISEASES, HEALTH AND SUSTAINABILITY**

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ABSTRACT

Climate change means long-lasting changes in Earth's climate systems, predominantly triggered by anthropogenic influences. Climate change plays a significant yet often under-recognized role in shaping the global incidence and distribution of parasitic diseases. This review synthesizes current knowledge on how climatic and ecological disturbances directly and indirectly influence parasitic organisms, their vectors, and host species. Alterations in temperature, precipitation, and habitat structure modify ecological niches, vector behavior, and host availability, creating conditions that promote parasite development, reproduction, and transmission. As a result, diseases such as malaria, cryptosporidiosis, leishmaniasis, trypanosomiasis, giardiasis and helminthiasis (schistosomiasis, filariasis and onchocerciasis) are emerging or expanding into previously unaffected regions. Many zoonotic parasites operate within sylvatic, zoonotic, and anthroponotic cycles, all of which are sensitive to environmental change. Shifts in ecological balance therefore contribute to new epidemiological patterns, increasing disease prevalence and imposing greater burdens on public health systems and economies. The growing threat of climate-driven parasite emergence underscores the need for integrated, multidisciplinary approaches based on the One Health framework, enhancing early detection, surveillance, reporting, and development of medical countermeasures to safeguard global health.

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Abstract No. 287

**ENVIRONMENTAL IMPLICATIONS OF
MAGNETO-HYDRODYNAMICS FLOW AND HEAT
TRANSFER WITH CARBON NANOTUBES**

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ABSTRACT

Global warming is a critical problem that requires innovative solutions to reduce its impacts. Heat transfer is directly linked to global warming through various mechanisms, including the absorption and trapping of infrared radiation by greenhouse gases, which shows down the earth natural heat radiation space. Additionally, anthropogenic heat release from human activities and dissipation of heat from burning fossil fuels and nuclear power contribute to a net warming effect on the atmosphere and oceans. This study explores the potential of magnetohydrodynamic flow and heat transfer with carbon nano tubes to enhance heat transfer efficiency and reduce energy consumption. This study investigates that the magnetohydrodynamic flow and heat transfer of carbon nano tubes down a flat plate, using water as the base fluid and two types of carbon nano tubes (SWCNTS and MWCNT). Our results show that carbon nanotubes can significantly enhance heat transfer efficiency, potentially leading to reduced energy consumption and greenhouse gas emissions. The study's findings have implications for various industries, including energy production, and automotive, and can contribute to global efforts to mitigate global warming. The use of carbon nano tubes in biomedical application can improve human health outcomes and quality of life. carbon nano tubes can improve energy efficiency, reduce energy consumption, and lower greenhouse gas emissions, contributing to a cleaner environment. This study highlights the potential of carbon tubes to drive sustainable development and reduction environmental impacts, while also contributing to societal happiness.

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Abstract No. 288

**THE PORTRAYAL OF WATER AND CLIMATE CHANGE
IN THE GLOBAL SUSTAINABLE DEVELOPMENT**

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ABSTRACT

The global climate change crisis is inextricably linked to water. Climate change is increasing variability in the water cycle thus inducing extreme weather events, reducing the predictability of water availability, decreasing water quality and threatening sustainable development, biodiversity and enjoyment of the human rights to safe drinking water and sanitation worldwide. The growing global demand for water increases the need for energy-intensive water pumping, transportation and treatment, and has contributed to the degradation of critical water-dependent carbon sinks such as peat lands. In addition, some climate change mitigation measures, such as expanded use of bio fuels can further exacerbate water scarcity. National and regional climate policy and planning must take an integrated approach to climate change and water management. Increased water stress and meeting future demand will require increasingly tough decisions about how to allocate water resources among competing water uses, including for climate change mitigation and adaptation activities. If a sustainable future is to be created, continuing along a “business as usual” pathway is no longer an option and water management needs to be scrutinized through a climate-resilience lens. Increased investment is needed in improving hydrological data, institutions, governance, education, capacity development, risk assessment and knowledge sharing. Policies need to ensure the representation, participation, behavioural change, accountability of all stakeholders, including the private sector and civil society.

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Abstract No. 289

**ECONOMIC IMPLICATIONS OF CLIMATE
CHANGE IN DEVELOPING COUNTRIES**

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ABSTRACT

Climate change has emerged as one of the most critical global challenges of the 21st century, and its economic repercussions are particularly severe in developing countries. These nations often depend heavily on climate-sensitive sectors such as agriculture, fisheries, forestry, and informal labor markets, making their economies highly vulnerable. Rising temperatures, irregular monsoon patterns, prolonged droughts, frequent flooding, and extreme weather events severely disrupt agricultural productivity, leading to reduced crop yields, food shortages, and unstable farmer incomes. This decline in agricultural output directly affects national GDP, increases inflation in food prices, and intensifies rural poverty. Beyond agriculture, climate change places immense pressure on water resources, worsens public health burdens through the spread of vector-borne diseases, and damages infrastructure such as roads, bridges, housing, and power supply systems. These disruptions result in high economic losses and force governments to divert funds from development projects to disaster relief and rebuilding. Additionally, reduced labor productivity due to heat stress and climate-related illnesses further weakens economic performance. Coastal developing countries face additional threats such as rising sea levels, saltwater intrusion, and displacement of communities, resulting in increased migration, unemployment, and social instability. Financial limitations, lack of technological resources, and insufficient institutional capacity restrict the ability of developing nations to effectively adapt to climate change. As a result, the economic impact becomes more severe over time, widening income inequality and creating long-term developmental setbacks. The growing need for climate-resilient infrastructure, early-warning systems, sustainable agriculture, and renewable energy investments highlights the urgency for national and international support. Understanding the economic implications of climate change is essential for developing comprehensive policies that strengthen resilience, protect livelihoods, and promote sustainable and inclusive growth in developing countries.

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Abstract No. 290

**GREEN MANURE PRACTICES FOR IMPROVING SOIL
QUALITY AND SUPPORTING SUSTAINABILITY**

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ABSTRACT

Green manure involves the use of specific cover crops cultivated and incorporated into the soil to enhance its fertility, structure, and biological activity. This practice, particularly involving leguminous species such as cowpea, sunn hemp, and sesbania, significantly contributes to sustainable agriculture by naturally fixing atmospheric nitrogen, thereby reducing the need for synthetic fertilizers. Incorporating green manure can increase soil organic matter content by up to 30%, enhancing microbial activity and improving soil health and resilience. Notably, the biological nitrogen fixation rates can range from 50 to 150 kg per hectare per cropping cycle, depending on crop species and environmental conditions. Additionally, green manure plays a vital role in reducing greenhouse gas emissions linked to fertilizer production and application, aiding climate change mitigation efforts. It also offers benefits such as erosion control, weed suppression, and increased biodiversity, supporting ecosystem stability. Economically, farmers experience lower input costs and improved crop yields, with yield increases of 15-20% reported in organic and low-input systems. The integration of green manure aligns with global sustainable development goals by promoting environmentally friendly farming practices, ensuring food security, and contributing to climate resilience. Challenges such as knowledge gaps among farmers and initial establishment costs need to be addressed through education and policy support. Overall, green manure presents a viable and effective approach to fostering sustainable agricultural systems that balance productivity with environmental conservation.

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Abstract No. 291

**ENVIRONMENTAL ETHICS AND HUMAN
RESPONSIBILITIES FOR SUSTAINABLE DEVELOPMENT**

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ABSTRACT

Environmental ethics and human responsibility explores the moral relationship between humans and the natural world. Environmental ethics teaches that the environment is not just a resource but a moral community. Humans, as the most capable species, have a responsibility to: Protect nature, Ensure sustainability, Safeguard the planet for future generations. A shift from exploitation to stewardship is essential for the survival of both humanity and the Earth. Human responsibilities arise from these ethical principles and shape our behavior, policies, and attitudes toward nature. The role of ethical awareness in shaping sustainable development policies, promoting responsible consumption and encouraging conservation-oriented behaviors is significant. By integrating environmental ethics into education, policy frameworks, and everyday practices, societies can foster a more harmonious relationship with the environment. Ultimately, the fulfilling human responsibilities are essential for safeguarding natural resources and ensuring long-term sustainable development for current and future generations.

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Abstract No. 292

**ACTIVE BIOMONITORING WITH PYXINE COCOES (SW.)
NYL.: TEMPORAL AND CONCENTRATION DEPENDANT
ACCUMULATION OF CADMIUM AND THEIR
PHYSIOCHEMICAL IMPLICATIONS**

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ABSTRACT

Biomonitoring of air quality using lichens has gained considerable recognition due to its ability to provide time-integrated exposure data. Lichens, which are symbiotic associations between a photobiont (alga or cyanobacterium) and a mycobiont (fungus), serve as suitable biomonitors due to their atmospheric nutrient uptake through non-discriminatory absorption mechanisms. A key advantage of lichens is their versatility in supporting both passive and active monitoring approaches; they can be transplanted to different locations and rapidly acclimate without the prolonged establishment period required by vascular plants such as trees. *Pyxine cocoas* (Sw.) Nyl., commonly found throughout the tropical regions of the Indian subcontinent, exemplifies such potential. The present study investigated the in vivo cadmium accumulation capacity of *Pyxine cocoas* through a transplantation experiment involving periodic exposure to cadmium solutions at four concentrations: control (0 μM), 5 μM , 50 μM , and 100 μM . Thalli were harvested on the 10th and 30th days for analysis of cadmium accumulation, cell membrane integrity, and photosynthetic parameters. Results demonstrated that *Pyxine cocoas* exhibited substantial cadmium bioaccumulation, reaching 137.08 $\mu\text{g g}^{-1}$ dry weight at the highest treatment (100 μM), confirming its efficacy as an atmospheric cadmium biomonitor. Exposure to cadmium significantly compromised cell membrane integrity, as evidenced by elevated electrolyte leakage (28.18 $\mu\text{S cm}^{-1}\text{g}^{-1}$) in the 100 μM treatment, indicating disruption of the plasma membrane. Cadmium accumulation adversely affected chlorophyll a content, leading to its degradation, while carotenoid levels increased, likely as a protective response to oxidative stress. These findings support the utilization of *Pyxine cocoas* as a reliable biomonitor for cadmium pollution, with cell membrane integrity (measured via electrolyte leakage) serving as a sensitive physiological indicator of metal-induced stress.

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Abstract No. 293

**MICROPLASTIC PRODUCTION DECAY
WITH TEMPORAL VARIATION**

**Bhoomika Pandey, Ambrish Kumar Tiwari, Sudhir Kumar Dubey,
Matsyendra Nath Shukla and Priyanka**

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ABSTRACT

Microplastic pollution has become a critical global issue due to its persistence, ubiquity, and long-term ecological risks. This study focuses on the temporal decay of microplastic production and its variation across different time scales. A conceptual framework is proposed to analyze how production rates decline under the combined influence of natural degradation, particle fragmentation, and environmental retention processes. The results demonstrate that microplastic production does not follow a simple linear trend but instead exhibits time-dependent variations influenced by both environmental dynamics and anthropogenic activities. These findings highlight the necessity of incorporating temporal decay into predictive models, providing valuable insights for assessing long-term pollution risks and designing sustainable mitigation strategies.

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Abstract No. 294

**WATER QUALITY ASSESSMENT OF WETLANDS IN
GORAKHPUR DIVISION, UTTAR PRADESH INDIA**

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ABSTRACT

Wetland plays a crucial role in sustaining nutrient cycle, groundwater recharge, regional biodiversity, and livelihood support. However, growing anthropogenic pressure has resulted in deterioration of their ecological health. The present study analyses the water quality index of six major wetlands present in Gorakhpur division, Bakhira, Ramabhar, Chilua, Ramgardi, Gander and Maheshra using key physicochemical parameters pH, temperature, TDS, TSS, chloride content, dissolved oxygen (DO), biological oxygen demand (BOD) and chemical oxygen demand (COD). The pH values ranged from 7.03–9.61, indicating a shift toward alkaline condition in Ramgardi Lake. DO vary significantly from 4.1 to 14.2 mg/L, reflecting differential aquatic diversity and increase in organic based pollutants. Higher values of COD 408–480 mg/L and BOD 8–61 mg/L were recorded across sites of Ramgardi and Chilua Lake, having substantial pollution load when compared to other four lakes, this may be due urban challenges faced by these two wetlands. Elevated TSS at Ramgardi (61 mg/L) suggests active sedimentation and reduced water clarity; whereas Gander Lake exhibited lowest TDS (38 mg/L) indicating less mineralization. The highest salinity was recorded at Bakhira Lake when compared to other wetlands of the region. The study concludes the entire wetlands experience pollution as major stressor following anthropogenic activities and agriculture runoff. The study highlights, deterioration of ecological integrity of wetlands, a continuous monitoring and sustainable management policies is needful in wetland conservation.

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Abstract No. 295

**HEALTH STATUS AND HEALTH SEEKING BEHAVIOR OF
RURAL ELDERLY PERSONS IN KALAKANKAR BLOCK
(PRATAPGARH DISTRICT) OF UTTAR PRADESH**

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ABSTRACT

Population ageing is a worldwide phenomenon, and India reflects this trend strongly. Over the past fifty years, India's total population has nearly tripled, while the elderly population has increased more than fourfold. By 2050, people aged 60 years and above are expected to constitute almost 19 percent of the country's population. In Uttar Pradesh, 7.7 percent of the population falls under the elderly age group, and the state has the highest number of elderly persons in India. The elderly population in India is increasing rapidly, creating significant social, economic, and public health challenges. These issues are especially severe in rural areas, where older adults face multiple problems such as poor nutrition, chronic illnesses, physical weakness, economic dependence, and limited family or community support. The rural health system further intensifies these difficulties due to inadequate medical facilities, long distances to healthcare centre, shortage of trained doctors, and low awareness of preventive healthcare practices. As a result, many rural elderly individuals rely on home remedies or traditional healers, often delaying proper treatment and worsening their health conditions. Kalakankar Block in Pratapgarh District represents such a rural environment where low income levels, poor transportation, limited healthcare infrastructure, and low literacy significantly affect the health and health-seeking behaviour of elderly persons. Understanding how the rural elderly deal with illness, which healthcare sources they prefer, and what obstacles they experience while accessing treatment is crucial for improving their well-being. This study focuses on assessing the physical, mental, and social health status of rural elderly individuals in Kalakankar Block and analysing the socio-economic, cultural, environmental, and infrastructural factors that influence their health-seeking behaviour. The findings aim to highlight existing gaps in rural healthcare delivery and provide recommendations for designing more effective, accessible, and elderly-friendly health programs in the region.

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Abstract No. 296

**ENVIRONMENTAL ETHICS AND
HUMAN RESPONSIBILITIES IN INDIA**

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ABSTRACT

Environmental ethics in India has evolved as a critical framework for understanding the moral, legal, and societal obligations humans owe to the natural world. The Indian context is unique, as environmental protection is not merely a matter of policy choice but a constitutionally recognized duty. Article 48A of the Directive Principles of State Policy mandates the State to protect and improve the environment, while Article 51A(g) places a fundamental responsibility on every citizen to safeguard the natural environment. These constitutional provisions form the ethical and legal foundation for India's environmental governance. Building upon this framework, Indian environmental jurisprudence shaped significantly by Public Interest Litigation (PIL) and the dynamic role of the Supreme Court and High Courts has expanded the scope of environmental rights, often interpreting the right to life under Article 21 to include the right to a clean and healthy environment. Landmark judgments such as *MC Mehta v. Union of India*, *Vellore Citizens' Welfare Forum v. Union of India*, and *Subhash Kumar v. State of Bihar* have integrated ethical principles like sustainable development, the precautionary principle, and the polluter pays principle into enforceable legal norms. India's policy landscape, guided by statutes like the Environment Protection Act, 1986, the Wildlife Protection Act, 1972, and the Air and Water Acts, further operationalizes these ethical commitments. Collectively, these frameworks underscore a holistic vision where environmental ethics and human responsibilities converge, establishing a legal regime that seeks to balance ecological preservation with developmental imperatives, an imperative increasingly central to India's contemporary environmental challenges.

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Abstract No. 297

**IMPACT OF DEVELOPMENT ON ENVIRONMENT WITH
REFERENCE TO EXHAUSTION OF NATURAL RESOURCES**

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ABSTRACT

Economic development is need of present era. It is widely has been accepted by all for a marker of human development and wellbeing, but it often comes at a high environmental cost. One of the most significant adverse effects of development is the exhaustion of natural resources, leading to biodiversity loss, ecological degradation, and impaired ecosystem services. When we chose the path of Growth and Development through industrialization, urbanization and population growth that drives the prompt extraction and degradation of natural resources. Between 1950 and 1960, the renowned economist Simon Kuznets proposed a theory regarding the impact of development on the environment. He proposed that environmental degradation occurs at a very rapid pace in the initial stages of development, which is considered the pre-industrial era. In the second stage, which is considered the industrial era, natural degradation occurs at a steady pace. In the third stage, which is considered the post-industrial era, environmental degradation is declining. A diagram depicting this results in an inverted U-shaped curve, known as the Kuznets's environmental curve. The analysis draws on empirical studies covering resource degradation, energy consumption, and environmental depreciation, par ticularly in emerging economies. We also explore governance, technological innovation, and sustainable development strategies that can mediate or reverse the negative impacts of development. To prevent this environmental degradation, it becomes essential for the government to make optimal and efficient allocation of natural resources through resource governance so that along with sustainable development, natural resources can be preserved for future generations and human well-being.

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Abstract No. 298

**BUTTERFLIES AND ENVIRONMENTAL INDICATOR VALUES:
A TOOL FOR CONSERVATION IN A SHIFTING ECOSYSTEM**

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ABSTRACT

This study investigates the efficacy of using butterfly assemblages as bioindicators for tracking and managing rapid environmental change in urban-industrial landscape of Kanpur, Uttar Pradesh. As a major urban agglomeration under pressure from industrialization, pollution, habitat fragmentation, and the spread of exotic species (like *Lantana camara*), Kanpur provides an essential setting for assessing indicator-based conservation techniques establishing a baseline of butterfly diversity and abundance in the urban and peri-urban areas of Kanpur (P.A.C. Highway, Allen Forest, and Chandra Shekhar Azad University). Because of their short life cycles, high sensitivity to microclimatic changes, and unique habitat requirements, butterfly populations provide a reliable and early warning system for ecosystem health and biodiversity loss. This study looks at patterns of butterfly variety and abundance across the varied urban-industrial landscape of Kanpur, Uttar Pradesh, to understand the influence of significant environmental factors. Butterfly diversity is a crucial metric in this rapidly expanding city that is severely strained by development, pollution, and habitat loss because butterflies are significant bioindicators of ecosystem health.

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Abstract No. 299

ACRYLAMIDE: THE HIDDEN THREAT IN ADOLESCENT DIETS

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ABSTRACT

Acrylamide (AA), a process contaminant formed primarily through the Maillard reaction between reducing sugars and the amino acid asparagine during high-temperature cooking (above 120C), represents a significant and often overlooked public health risk for adolescents. This abstract examines the sources of dietary acrylamide in this vulnerable population and discusses the associated health threats. Adolescents exhibit a high consumption of carbohydrate-rich, thermally processed foods such as French fries, potato chips, breakfast cereals, and baked goods, which are known to contain elevated levels of AA. Exposure assessments consistently show that children and adolescents have a higher intake of AA per unit of body weight than adults, placing them at increased risk. The primary health concerns stem from AA's classification as a "probable human carcinogen" (IARC Group 2A) due to its potential genotoxic and carcinogenic properties demonstrated in animal studies. Furthermore, AA and its metabolite, glycidamide, are neurotoxicants, raising concerns about potential long-term effects on the developing nervous system. While non-carcinogenic risk (Target Hazard Quotient, THQ) is often considered low, the Carcinogenic Risk (CR) values calculated for high-consumer adolescents frequently indicate a need for continued exposure reduction efforts. Addressing this hidden threat requires a multi-faceted strategy encompassing food safety regulation, targeted public health education, and sustainable food processing interventions. Strategies include advising consumers to cook foods to a "golden yellow" color rather than dark brown, promoting reduced consumption of high-risk foods, and encouraging the food industry to implement mitigation techniques such as raw material selection (e.g., low-reducing sugar potatoes) and optimizing heating processes. Ultimately, reducing dietary acrylamide exposure is critical for safeguarding adolescent health and promoting sustainable, safer food systems.

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Abstract No. 300

**THE ROLE OF SOLAR ULTRAVIOLET RADIATION
ON LIFE STAGES OF FISH IN UTTARAKHAND**

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ABSTRACT

Depletion of ozone molecules in the stratospheric layer increases the flow of solar ultraviolet (UV) rays on the surface of the earth. Current levels of ultraviolet Radiation (UVR) represent a significant threat on aquatic and terrestrial organism. Monitoring of solar ultraviolet- B (UV-B) radiation has been performed in Uttarakhand and biological effects have been observed in fingerlings and adults. The fingerlings were exposed with solar UVB and artificial UVB in presence of photosensitizers. UV- radiation affects the growth, mortality, behavior, metabolism by affecting enzyme activities. Currently stratospheric ozone dynamic and climate change interact strongly, enhancing exposure of organism. Aquatic animals are naturally exposed to retene due to presence in water bodies. Retene is a natural chemical compound that belongs to the group of PAHS and riboflavin is vitamin-B. Fish fingerlings exposed to Solar UVB and artificial UVB with retene and riboflavin. Artificial UVB had a stronger damaging effect than solar radiation and become highly toxic in presence of retene. Riboflavin is slightly phototoxic in presence of solar and artificial – B. Difference in phototoxicity of riboflavin and retene were observed through growth, swimming and behavioral changes and supported by results on mortality rate and metabolism by affecting enzyme activities. Solar UV-B level is increased at high altitude. It causes skin erythema and cataract of eye thus affects the tourism in Uttarakhand.

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Abstract No. 301

**STUDY THE BIOLOGICAL MECHANISMS INVOLVED IN
VERMICOMPOSTING AND THE ROLE OF *EISENIA FETIDA* IN
ACCELERATING ORGANIC MATTER DECOMPOSITION**

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ABSTRACT

Vermicomposting is a bio-oxidative fragmentation process where earthworms (*Eisenia fetida*) and microorganisms together convert organic waste into an organic fertilizer that is nutrient-rich. Earthworms serve as biological decomposers that consume organic matter and enhance microbial activities in their gut. This rise in use chemical fertilizers has led to concerns about soil health degradation and environmental pollution arising from fertilizer use in agriculture. As eco-friendly methods for managing organic waste, vermicomposting has been described as a sustainable alternative. This review describes the important role of *Eisenia fetida* in agriculture waste decomposition and its effects on the fertility and growth of soil and plants. The practice of vermicomposting is a benign and efficient method to convert organic matter into a fertile product and an integral process in the management of the food chain. However, challenges like scalability, farmer awareness and environmental constraints prevent large scale adoption. This paper highlights the mechanisms, benefits, applications, and challenges associated with vermicomposting while stressing the need for additional research and technological progress in the area.

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Abstract No. 302

**SEASONAL DYNAMICS OF PHYSICO-CHEMICAL AND
BIOLOGICAL PARAMETERS IN TWO DIFFERENT
PONDS OF KANPUR**

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ABSTRACT

From October 2024 to September 2025, this study assesses the seasonal changes in the physico-chemical and biological characteristics of two freshwater pond ecosystems: Bithoor and Panki Kachhua Talab. Measurements of pH, dissolved oxygen, nutrient concentrations, total dissolved solids, and biological communities including zooplankton and phytoplankton were all part of the monthly analyses. Higher levels of nutrients, total dissolved solids, and algal blooms were seen in the summer at both locations, indicating a significant seasonal influence. Eutrophic conditions predominated in Bithoor, where nutrient enrichment from organic inputs and surface runoff resulted to high biological productivity but also sporadic ecological stress and lower dissolved oxygen levels. Phytoplankton communities were dominated by Chlorophyceae and Cyanophyceae, which peaked in late spring and early summer; robust phytoplankton blooms were negatively linked with zooplankton concentrations. With seasonal variations in trophic interactions, the Panki Kachhua Talab ecosystem demonstrated resilience and ecological stability while maintaining usually acceptable water quality and diverse planktonic populations. The study emphasizes how crucial it is to regularly evaluate water quality and use intervention techniques like desilting and nutrient load reduction to stop eutrophication. In order to maintain aquatic biodiversity and ecosystem health, the results offer a thorough dataset and practical suggestions for future pond management.

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Abstract No. 303

**ENVIRONMENTAL CHANGES AFFECTING
THE BIONOMICS OF SANDFLIES**

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ABSTRACT

Sandflies are carriers of various diseases, including leishmaniasis and sandfly fever. Their ecological adaptation and presence make them dangerous for most of the animals including humans. Their adaptation to new environment has many factors like physiological adaptations, behavioral adaptations and genetic adaptations. The sandflies have evolved physiological systems to withstand extreme temperatures and humidity levels, allowing them to survive in both hot and humid or arid situations. As surroundings change, sandflies' feeding habits may vary, including alterations in the types of hosts they seek (for example, from wild animals to humans), affecting disease transmission dynamics. They use a variety of ways to find their hosts, including detecting carbon dioxide and body heat. These changes boost their capacity to discover and feed on hosts, which is critical to their reproductive success. Most sandflies are nocturnal, which minimizes their vulnerability to predation. However, certain species adapt to being active throughout the day, especially in urban environments where their natural predators may be less common. Sandfly populations have genetic variety, which allows for adaptations to local settings. This diversity can result in evolutionary adaptations that improve their survival and efficiency as disease vectors. Urbanization changes habitats, which can lead to more breeding grounds for sandflies. Climate change influences their range and behavior, driving them further into cities and altering their interactions with humans and viruses. Sandflies' capacity to adapt to various surroundings, especially urban areas, presents challenges for disease control while also highlighting the need for innovative management measures.

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Abstract No. 304

**STUDY OF BIOGEOCHEMISTRY OF WATER
QUALITY IN MAHAKUMBH 2025**

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ABSTRACT

The Mahakumbh, the largest mass gathering on the banks of the Ganga and Yamuna, exerts considerable pressure on river ecosystems. This study examines the biogeochemistry of water during Mahakumbh, focusing on physico-chemical parameters (pH, DO, BOD, COD, turbidity, nutrients) and Radiological Assessment of Environmental Exposure by Using Alpha, Beta Counters and Dosimetry. Findings reveal sharp fluctuations in water quality during peak bathing days, with increased nutrient loads and microbial contamination, though signs of natural recovery were observed post-festival. The results highlight the importance of continuous monitoring and eco-sustainable practices to safeguard water quality and public health during such large congregations. Removing too much water from surface waters and groundwater are the basic reasons. Spills/leaks from oil and chemical containers, waste products etc add to this. Various impurities of water include dissolve solids, microorganisms and chemicals. They pose great health risk. The soil and vegetation along river banks naturally filter out pollutants and sediments, improving water quality. In addition to industrial waste and agriculture, sewage and waste water are the main reasons for water pollution. On the view of Mahakumbh, various reports have been given by different organizations. High levels of faecal coliform were found in river water in which people took holy dip during Mahakumbh. This is according to the report submitted to National Green Tribunal (NGT) by Central Pollution Control Board (CPCB). The NGT made a report that found high levels of fecal coliform bacteria in the river water.

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Abstract No. 305

**IMPACT OF ENVIRONMENTAL
CONTAMINANTS ON HUMAN HEALTH**

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ABSTRACT

Multiple contaminants from the environment have an extensive effect on human health, negatively affecting both public and individual health as well as climate change, leading to larger rates of morbidity and mortality. The relationship between pollutants and health effects needs to be investigated further because there is a dearth of data on pollution exposure from developing nations with poor waste management, a greater level of poverty, and lesser adoption of advances in technology. (Shilpa et.al. 2023) This kind of situation happens in many developed nations, where remedies are found only after the damage has been done and the need for safeguards has lessened. Due to obstacles to calculating exposure levels and a lack of systematic monitoring, the correlation between environmental toxins and health needs to be better understood. Both acute and chronic disorders are brought on by different contaminants. In addition, when disease issues come up because of lengthy exposure to these pollutants, research becomes complicated. In order to close this knowledge gap, this review will focus on the present understanding regarding the association between environmental pollutants and human health. This over view covers the causes of cancer as well as the effects of different environmental pollutants on the respiratory, nervous, reproductive, infantile development and cardiovascular systems of human beings.

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Abstract No. 306

**SUSTAINABLE AQUACULTURE AND FOOD SECURITY:
UNDERSTANDING FISH REPRODUCTION**

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ABSTRACT

The global demand for fish and seafood is rising, emphasizing the need for sustainable aquaculture practices that prioritize food safety, human health, and environmental conservation. Fish reproduction plays a critical role in aquaculture, and understanding the underlying mechanisms can inform strategies for improving fish production while minimizing environmental impact. This study explores the interaction between insulin-like growth factor 1 (IGF1) and gonadotropin-releasing hormone (GnRH) in regulating gonadotropic hormones (FSH and LH) in the Indian freshwater catfish, *Heteropneustes fossilis*. Our results show that IGF1 and GnRH have time- and dose-dependent effects on *fshβ* and *lhβ* gene expression and FSH secretion. The synergistic impact of IGF1 and GnRH on gonadotropin transcripts and FSH protein levels highlights the complex interplay between somatotrophic and gonadotropic axes. This knowledge can inform strategies for optimizing breeding protocols, improving fish production, and promoting sustainable aquaculture practices that support global food security.

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Abstract No. 307

**ECOFEMINISM AND GRASSROOTS ENVIRONMENTAL
MOVEMENTS IN THE GLOBAL SOUTH**

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ABSTRACT

Ecofeminism offers a unique perspective on the environment. It links the oppression of women to the destruction of the environment. This view helps us understand environmental movements in countries in the Global South. In these areas, women who face discrimination are often leaders in resisting harmful business practices and the long-lasting effects of colonialism. This study looks at how ecofeminist ideas are put into action by indigenous groups in India, Latin America, and sub-Saharan Africa. Some examples include the Chipko movement in India, the Zapatista women's groups in Chiapas, Mexico, and the Green Belt Movement in Kenya. Using research methods that combine historical research, interviews, and community involvement, the study explores how these movements work to regain control of their land and challenge male-dominated systems that affect environmental policies. The study shows that ecofeminist approaches, which emphasize caring relationships, giving and taking, and practical knowledge, help communities challenge traditional ideas of economic growth. These approaches also help create strong support networks and alternative economic systems. Even so, these movements face ongoing problems such as government crackdowns, unequal funding, and gender inequalities within their own communities. These issues show that it is important to form alliances that include different perspectives and give a stronger voice to those in the Global South in discussions about climate change. In conclusion, this study calls for ecofeminism to be used as a teaching tool for environmental justice. It encourages researchers and policymakers in developed nations to focus on the knowledge and experiences of the Global South when addressing the ways climate change affects women. By studying these less-heard perspectives, the study hopes to change the way environmental issues are studied. The aim is to create fair and sustainable solutions for the future.

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Abstract No. 308

**COMMUNITY-MANAGED FORESTS: COMPARING
TRIBAL GOVERNANCE VS. STATE MANAGEMENT**

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ABSTRACT

Community-run forests are a key place to study different ways to govern in our current era. This can be done by comparing native tribal systems with central governments. This piece asks about how well tribal governance works—looking at its customary laws, group care, and knowledge of nature and culture—compared to state-run management, which often has bureaucratic control, commercialization, and forced rules from the top. Using info from different places in India (like the Dongria Kondh forests in Odisha) and Brazil (like Kayapó lands versus Amazonian state deals), we use various methods. We look at deforestation rates using maps, involve native groups in making maps, and study the language of national forest laws. The data suggest that tribal governance leads to better conservation of plant and animal life (for example, deforestation rates are 30-50% lower). It also adapts better to changes in climate. This is because it creates harmony between society and nature through ways of seeing the world that value giving back over taking. State management, while it does provide infrastructure support, often makes inequality worse by allowing elites to take over and displace old rights. This leads to broken ecosystems and social disruption. This comparison emphasizes the demand for mixed governance models that give power to native groups. By pushing for knowledge justice in forest policy, this work promotes decolonial environmental governance. It gives practical ideas for global projects and goals for protecting nature.

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Abstract No. 309

**CLIMATE CHANGE FINGERPRINTS ACROSS
NORTHERN INDIA: A CASE STUDY OF MONSOON &
RISING WATER IN THE PUNJAB FLOODS -2025**

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ABSTRACT

The South Asian monsoon branch brought exceptionally high rainfall over the state of Punjab, India, triggering one of the most destructive flood events the state has experienced in recent decades. More than 55 people lost their lives, over 1,400 villages were inundated. Approximately 250,000 acres of agricultural land were damaged, severely disrupting livelihood, food security, and rural infrastructure. These impacts highlight the region's growing vulnerability to intense hydroclimatic extremes. Although Punjab has historically been flood-prone due to its alluvial lowland terrain and extensive canal systems, the magnitude of the 2025 floods aligns with long-standing scientific warnings that climate change is intensifying monsoon rainfall. The literature review shows that large-scale analysis of the rainfall patterns reflects three fold rise across India from 1950 to 2015. Basin and region specific studies, highlighted, hydroclimatic non-stationarity, compound factors of flooding, and the increasing influence of western disturbance across north-western India. Despite these warnings, persistent governance gaps including deteriorated embankments, poor drainage system and widespread encroachment onto natural floodplains, left Punjab insufficiently prepared for the 2025 floods. This study investigates the climate change fingerprints on the 2025 floods over Punjab using ground-based meteorological observations, ERA5 reanalysis data, and down scaled CMIP6 climate model simulations. Hydrological modelling (HEC-HMS) and Generalized Extreme Value (GEV) statistical methods were employed. Event attribution experiments comparing present-day with pre-industrial climatic conditions show that anthropogenic warming increased the likelihood of flood induced extreme rainfall by 3-5 times and amplified rainfall intensity by approximately 18-24%. The results confirm a strong climate change signal in the 2025 Punjab floods, emphasizing the urgent need for strengthened state-level adaptation, early-warning systems, and sustainable floodplain governance to safeguard India's most agriculturally vital region.

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Abstract No. 310

**POLYMER DUST OVER THE RIVER GOMTI: SPATIAL
PATTERNS OF PM_{2.5} AND EMERGING AIRBORNE
MICROPLASTICS IN LUCKNOW CITY**

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ABSTRACT

Lucknow, the capital of Uttar Pradesh, is one of the fastest-growing cities in the Indo-Gangetic Plain, where built-up land has expanded markedly over the past three decades and the population has crossed several millions. This rapid horizontal and vertical expansion along the Gomti River has intensified dense traffic corridors, high-rise residential clusters and commercial hubs, thereby increasing the exposure of a growing urban population to chronic particulate pollution. Recent air-quality assessments indicate that PM_{2.5} concentrations frequently range between 200 to 280 µg/m³ during peak pollution periods, exceeding the WHO 24-hour guideline by more than sixteenfold. Vehicular emissions continue to be a primary cause of increased particulate levels. In parallel, geographical studies on water bodies reveal substantial microplastic contamination in the Gomti River, with surface waters and sediments dominated by synthetic fibres, indicating a significant polymer burden in the floodplain of the river Gomti. National measurements from major Indian metros also confirm the presence of inhalable airborne microplastics, with concentrations reaching up to ~14 µg/m³ in congested urban microenvironments and contributing measurably to PM₁₀ mass. These particles are increasingly recognised as vectors for chemical additives, heavy metals and pathogenic microbes, raising concerns about respiratory and systemic health effects. This study synthesises geographic and emerging microplastic evidences to propose a specific framework for Lucknow city linking riverfront morphology, land-use pattern, atmospheric stagnation, plastic use and traffic density to the spatial distribution of potential airborne microplastic hotspots. The framework highlights the urgent need for targeted monitoring, polymer-resolved source characterisation and risk of exposure evaluation in Lucknow. The study reflects the city as a critical testbed within the Indo-Gangetic plain for understanding the interaction between urbanisation and rising airborne microplastic pollution.

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Abstract No. 311

**ASSESSMENT OF MOLECULAR DIVERSITY IN
CANNABIS SATIVA L. USING SSR MARKERS ACROSS
60 GENOTYPES OF CIM-CS-64 PROGENIES**

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ABSTRACT

Cannabis sativa L. is characterized by remarkable genetic variation, essential for breeding improved varieties for fiber, seed, and cannabinoid production. This study investigated the molecular diversity and genetic relationships among 60 genotypes derived from progenies of the elite Indian accession CIM-CS-64 employing 20 polymorphic simple sequence repeat (SSR) markers. The selected SSR markers revealed substantial polymorphic information, indicating high genetic diversity within the studied population. Cluster analysis and principal coordinate analysis classified the genotypes into distinct groups, reflecting underlying genetic differentiation. Population structure analysis further supported the presence of multiple subpopulations with varying levels of admixture. The results demonstrate the effectiveness of the SSR markers in discriminating closely related cannabis genotypes and uncovering hidden genetic variation in CIM-CS-64-derived material. These findings provide a valuable molecular framework for germplasm characterization, core collection development, marker-assisted selection, and future breeding strategies aimed at enhancing fiber quality, cannabinoid profiles, and agronomic performance in *Cannabis sativa*.

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Abstract No. 312

**CLIMATE CHANGE: MITIGATION AND ENVIRONMENTAL
ETHICS FOR HUMAN WELL-BEING**

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ABSTRACT

Climate changes create one of the greatest challenges of the 21st century, affecting environmental stability, human health, economic security, and social well-being across the globe. This paper explores the interconnected roles of climate change mitigation and environmental ethics in promoting sustainable human development. Mitigation strategies such as renewable energy adoption, energy efficiency, sustainable agriculture, waste reduction, and technological innovations—form the scientific and practical foundation for reducing greenhouse gas emissions (CfCsCO₂, Mithane, NO₂, O₃) and slowing global warming. Complementing these efforts, environmental ethics provide a moral framework that emphasizes sustainability, intergenerational responsibility, justice, and the intrinsic value of nature. Together, these dimensions reinforce human well-being by enhancing public health, ensuring economic resilience, promoting social harmony, and restoring ecological balance. The study highlights the need for cooperative global action, community engagement, and environmental education to create a just, sustainable, and climate-secure future for present and future generations. Causes and effects of climate change on land use pattern, agriculture waste, effects of water resource, insects and virus, atmospheric temperature (Lanina, Alnino), Ice melting, retreatment of glacier, salanization of ocean, impact on health as flora and founa, industrialization, urbanization, population growth, agriculture, heat wave and cold wave, natural disaster as earthquake, volcano & Tsunami, biodiversity loss, food security and organic farming, natural farming, nutrition security, natural and manmade ecological crisis, pollution, soil erosion, water scarecity, weather cycle etc. National Action Plan on Climate Change including 8 national mission 30 June, 2008 are introduced for minimum effect of climate change for human health, environment and well being.

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Abstract No. 313

**HEAT WAVES AND PUBLIC HEALTH ETHICS: PROTECTING
VULNERABLE POPULATIONS IN A CHANGING CLIMATE**

Divya Hariharan and Piyush Kumar Trivedi

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ABSTRACT

Heat waves are rapidly emerging as one of the most severe consequences of climate change, especially in India and other regions of the Global South. Rising temperatures are creating a silent but serious public health crisis, with the greatest harm falling on those who are least able to protect themselves. Older adults, daily wage earners, low-income communities, women, children and individuals with limited access to healthcare face the highest levels of risk. Understanding heat waves as both an environmental and ethical challenge is essential for building fair and effective responses. Current public health systems, early-warning alerts, heat-action plans and cooling strategies often fail to reach the most vulnerable. Many communities remain unaware of danger levels, do not have access to safe shelter or cooling, and continue to work outdoors under unsafe conditions. Ethical concerns arise when climate impacts deepen existing social inequalities, placing heavier burdens on those with fewer resources. A human-centred approach to climate resilience is needed. Such an approach highlights the importance of accessible healthcare, community-based preparedness, improved labour protections, inclusive urban planning and stronger coordination across government departments. Viewing extreme heat as a matter of human rights reinforces the idea that health, dignity and the right to life must be central to climate adaptation efforts. Protecting vulnerable populations from heatwaves requires a combination of scientific understanding, ethical reasoning and compassionate public policy. As climate extremes grow more common, prioritising the safety and well-being of at-risk groups becomes an essential responsibility for sustainable and just climate governance.

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Abstract No. 314

**CLIMATE- SMART LIVESTOCK SYSTEM: METHANE
MITIGATION, ONE HEALTH AND FOOD SYSTEM
RESILIENCE IN A CHANGING CLIMATE**

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ABSTRACT

Livestock production is vital for global nutrition and livelihoods, yet it significantly contributes to climate change, environmental degradation, and emerging public-health risks. Enteric methane from ruminants represents a major share of agricultural greenhouse gas emissions, while manure-derived pollutants influence air quality, biodiversity, and human exposure to pathogens and antimicrobial residues. As climate change intensifies heat stress, degrades forage quality, and shifts disease patterns, livestock-dependent communities particularly in South Asia face increasing threats to food and livelihood security. This review synthesizes climate-smart strategies that improve production efficiency while reducing environmental footprints. Feed additives such as 3-NOP, tannins, and essential oils, along with optimized forage and precision nutrition, can reduce enteric methane by 20–40%. Heat-tolerant breeds, improved housing, and better physiological stress management enhance animal welfare in warming climates. Innovative manure management including anaerobic digesters, composting, and biochar reduces greenhouse gases, pathogen loads, and antimicrobial contaminants. A One Health lens reveals the interconnected risks of zoonotic spillover, vector-borne diseases, and AMR dissemination exacerbated by climate change. Integrating climate mitigation with antimicrobial stewardship, biosafety, and environmental surveillance is essential for protecting public health. At the food-system level, sustainable dairy and meat value chains, circular resource use, and community-based adaptation enhance resilience and reduce food loss. Nepal's mixed crop–livestock systems offer unique opportunities to combine indigenous practices with modern mitigation technologies. Overall, livestock is not only a climate challenge but also a potential climate solution. Advancing climate-smart, One Health aligned livestock systems is crucial for emission reduction, public-health protection, and the creation of resilient global food chains.

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Abstract No. 315

**EFFECT OF CLIMATE VARIABILITY ON
LIVESTOCK FOOD SUPPLY CHAIN**

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ABSTRACT

Climate variability has emerged as a major threat to the sustainability of livestock production and food supply systems. It is a major driver of change in global livestock systems affecting both primary livestock production and downstream food supply chains. This review paper assesses how increased temperature, rise in humidity, erratic rainfall patterns, change in precipitation and extreme weather conditions have an impact on livestock health and production, feed and water availability, processing and supply chain. Various studies consistently report that heat waves negatively affect animal physiology by increasing stress hormone levels and significantly reducing growth rate, milk yield, and reproductive performance also weakening the immune system, increasing the risk of disease outbreak promoting mortality rate. In addition, irregular rainfall patterns and altered precipitation negatively impact feed production, reduce predictability of feed supply, limit animal access to pasture, and cause nutritional deficiencies in several fodder crops. Disruption caused by Climate variability extend beyond farm level to downstream activities, affecting storage facility, transportation, market access with irregular trade pattern relying on complex logistic system. Overall, addressing climate variability through strategic livestock management and resilient food supply chain is crucial for promoting sustainable production and ensuring global food security.

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Abstract No. 316

**BANANA PLANT USES AND MEDICINAL
BENEFITS FOR HUMANS**

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ABSTRACT

The Banana plant (*Musa* species) is highly valued in tropical and subtropical regions for its diverse nutritional, economic, and medicinal benefits. Nearly every part of the plant including the fruit, leaves, flowers, stem, and roots serves important traditional or modern purposes, contributing to daily life and healthcare. Banana fruits are rich in potassium, magnesium, vitamin B6, vitamin C, and dietary fiber. These nutrients support heart health, help regulate blood pressure, and maintain proper nerve and muscle function. Their high fiber content aids digestion, prevents constipation, and promotes a healthy gut microbiome. Due to their natural carbohydrate content, bananas also provide quick energy, making them useful for children, athletes, and individuals needing rapid nourishment. Various parts of the plant play key roles in traditional medicine. The banana stem is known for its detoxifying and diuretic effects, helping remove toxins and reduce the risk of kidney stone formation. Its juice is commonly used to treat digestive discomfort and support urinary tract health. Banana flowers offer additional therapeutic benefits, particularly for regulating blood sugar levels, making them beneficial for people with diabetes. Their anti-inflammatory and antioxidant properties help strengthen immunity and may reduce the risk of chronic diseases. Banana leaves serve as natural, biodegradable food wrappers and cooking materials in many cultures. Though not consumed, they impart useful compounds to food and are believed to aid digestion. The roots and sap also hold medicinal value, often applied to minor wounds or skin irritations due to their mild antimicrobial qualities.

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Abstract No. 317

**ASSESSING THE EFFICACY OF MICROBIAL INOCULANTS
AND CONSORTIA ON GROWTH, BIOMASS AND YIELD OF
AMARANTH CROP GROWN IN SALINE SOIL OF LUCKNOW**

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ABSTRACT

Amaranthus (*Amaranthus caudatus* L., Amaranthaceae) is known to have high nutritional value with rich source of micronutrients and dietary minerals of both seeds and leaves. This pseudo-cereal has immense potential to survive in divergent agro-climatic conditions including salinity stress. In the present study, amaranth was sown in the experimental field at Babasaheb Bhimrao Ambedkar University in a randomized block design (RBD) for two subsequent years during the period from April 2021 to June 2022 and April 2022 to June 2023. The experimental treatments included the application of plant growth-promoting microbes, such as *Bacillus filamentosus*, *Bacillus firmus*, *Aspergillus tamari*, *Aspergillus terreus*, *Aspergillus luchensis* and *Trichoderma lixi* which were tested for their compatibility and colony-forming units. These microbes exhibited various plant growth-promoting activities such as phosphate solubilization, nitrogen fixation, IAA, ammonia and siderophore production. These microbes were firstly immobilised in organic amendments of bentonite, pressmud and molasses in 3:3:4 ratio as a carrier material and then applied twice in the field at the time of seed sowing and after a month of sowing seed into the soil in comparison to a control of soil only without any microbial or chemical treatments. Moreover, the application of microbial bioinoculants, as consortia of *Bacillus filamentosus* + *Bacillus firmus*, *Aspergillus luchensis* + *Trichoderma lixi* and *Bacillus filamentosus* + *Trichoderma lixi* resulted in significant improvements in growth, biomass and yield responses than the untreated control plants, thus providing food and nutritional security in an era of climate change.

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Abstract No. 318

**REGULAR FEED MONITORING SYSTEM FOR
GALLUS DOMESTICUS PRODUCTION UNITS**

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ABSTRACT

The present study was conducted on *Gallus Gallus Domesticus*, which is commonly known as the domestic chicken. These birds are one of the most important domesticated species in the world and are widely used for egg and meat production. A total of five chickens were kept in a metal cage divided into four parts. The arrangement included four males and one female. Three males were kept separately in individual parts of the cage, and one male was kept together with the single female in another part. This setup helped in observing both individual and pair behaviors. All chickens were around five to six months old at the beginning of the observation period. They were provided daily feed and clean water. The main aim of the observation was to study their feeding behavior, body weight changes, daily activity, egg-laying pattern, and physical condition over a period of one month. The feed given to the chickens included soybean, shredded coconut, drumstick leaves, and corn flour. These ingredients were provided as a balanced combination of protein, fats, vitamins, and carbohydrates. Soybean is known to be a good source of protein which helps in muscle development and overall growth. Shredded dry coconut provides natural fats and energy which are useful for maintaining body temperature and good feather condition. Drumstick leaves are rich source of vitamins, minerals, and natural antioxidants that support general health and increase egg quality. Corn flour was used as a source of carbohydrates and energy for daily activities. All feed materials were mixed properly and placed in a feeder so that each bird could eat comfortably. At the beginning of the study, all birds appeared healthy with bright eyes, clean feathers, and active behavior. As the days passed, some minor changes were noticed. A few birds became less active or showed reduced feeding interest for one or two days, possibly due to environmental temperature or digestion problems, consumption, waste, and general movement were noted. The male and female kept together showed reproductive behavior and the female laid eggs regularly in the initial days. During the first three to four days, the female laid eggs daily, and after that, the egg-laying interval increased to once every seven to eight days. These changes were also recorded to understand how feeding and environmental factors affected their reproductive activity.

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Abstract No. 319

**UNLOCKING THE VALUE OF UNDERUTILIZED FRUITS: A KEY
TO NUTRITION, HEALTH AND SUSTAINABLE LIVELIHOODS**

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ABSTRACT

Underutilized or underexploited horticultural crops possess immense potential to contribute to food security, nutrition, health, ecosystem sustainability and preservation of cultural identity. They are considered natural repositories of herbal healing compounds and have been widely used by traditional and tribal communities for managing and curing numerous ailments. Many underutilized fruits are regarded as “protective foods” owing to their richness in phytochemicals, vitamins and minerals such as calcium, iron, phosphorus, and vitamins A, B and C, which enhance the body's defence mechanism and reduce disease susceptibility. In India, several naturally occurring or cultivated horticultural crops—particularly dark-green and bright-coloured fruits and vegetables—remain underutilized despite being exceptionally rich in antioxidants. Fruit juices of underutilized fruit crops for instance, play a significant role in preventing and managing diseases such as scurvy, night blindness, asthma, bronchitis, fever, anaemia, ulcers, diabetes and even certain cancers. Likewise, the leaves, flowers, bark and roots of many lesser-known fruits including Karonda (*Carissa carandas*), Mahua (*Bassia latifolia*), Kamrakh (*Averrhoa carambola*), Khirni (*Manilkara hexandra*), Amra Paniyala (*Flacourtia indica*), Halphahari (*Phyllanthus acidismus*), Lasodha (*Cordia mixa*), Wood apple (*Feronia limonia*), Cape gooseberry (*Physalis peruviana*), etc. are widely utilized for therapeutic, medicinal and nutritional purposes. Recognizing and harnessing the therapeutic value of these underutilized fruits and promoting their use as nutraceuticals can play a crucial role in reducing malnutrition and improving public health. Therefore, it is imperative to explore, popularize and commercialize these crops at national and international levels to enhance the socio-economic and health status of society.

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Abstract No. 320

**DISCHARGE OF TANNERY EFFLUENT IN GANAGA RIVER
EFFECT THE HEMATOLOGICAL PARAMETERS OF CATFISH,
*HETEROPNEUSTES FOSSILIS***

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ABSTRACT

Tannery effluents, rich in salinity, organic matter, and inorganic pollutants pose serious risks to aquatic ecosystems. These pollutants disrupt physiological, hematological parameters. Hematological parameters in fish, including hematocrit, hemoglobin concentration, red and white blood cell counts, and various indices, are widely used as indicators of environmental and physiological health. This study is aim to observe the variations in different parameters of blood sample of cat fish *Heteropneustes fossilis* after exposure to Tannaery effluent. The experiment is performed with respect to control where the group of fishes is acclimatized in aquariums containing group I, (control) normal Tap water (7 days aerated) while the other four sub-lethal concentrations (group-II 2%, group-III 5 %, group-IV 10 %, and group-V 15% Tannery Effluents) for 15 days, 30 days, and 45 days respectively. After the completion of the exposure period three fishes has been selected for blood collection and to perform the lab experiments. Blood samples have been taken from all the experimental animals to evaluate the variations in Hb%, RBC, PCV, ESR and WBC. In Tannery effluent exposure Hb percentage, RBCs, PCV, MCH, and MCHC values were decreased significantly at 15, 30 and 45 days while MCV and WBC significantly increased. The white blood corpuscles count was significantly increased in the experimental groups at the end of the 15th 30th and 45th day of exposure periods. The sub-lethal concentrations of Tannery effluent induced changes in haematological parameters in exposed fishes against the control group A decrease in these parameters is a sign of microcystic hypochromic anaemia, which is caused by an increase in the rate at which erythrocytes break down. It highlights fish as bioindicators of pollution through hematological changes and advocates for improved wastewater treatment.

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Abstract No. 322

**FROM AWARENESS TO ACTION: A PSYCHOLOGICAL
STUDY OF ENVIRONMENTAL BEHAVIOUR IN GEN Z**

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ABSTRACT

Climate change is increasingly recognized not just as an environmental or policy challenge but also as a behavioural one, especially among Gen Z, who are at the centre of global climate conversations. This study aims to explore environmental awareness, attitudes and self-reported pro-environmental behaviour among Gen Z individuals through a simple online, questionnaire-based survey. The Google Form will include items on environmental knowledge, perceived personal responsibility, social norms, and everyday sustainable practices such as energy conservation, waste management and reduced plastic use. The data are analyzed descriptively to identify gaps between what Gen Z knows and what they actually practice, and to understand which psychological factors are most closely associated with climate-friendly behaviour. It is expected that while Gen Z shows high awareness and concern for the environment, consistent sustainable behaviour may remain limited due to factors such as low perceived behavioural control, social pressure or convenience-driven choices. The study highlights how psychological insights can strengthen environmental education and proposes behaviour-based strategies that can motivate Gen Z toward meaningful climate action.

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सतत विकास लक्ष्य (SDGs) को प्राप्त करने में आयुष्मान भारत योजना का महत्व

विपिन सिंह

राजनीति शास्त्र विभाग
ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश

शोध सार

आयुष्मान भारत योजना, भारत सरकार की सबसे महत्वपूर्ण स्वास्थ्य पहल है, जिसका उद्देश्य सभी नागरिकों, विशेषकर गरीब और वंचित वर्गों को गुणवत्तापूर्ण एवं सुलभ स्वास्थ्य सेवाएँ प्रदान करना है। यह योजना सतत विकास लक्ष्यों (SDGs) को प्राप्त करने में केंद्रीय भूमिका निभाती है। इस योजना से स्वास्थ्य, गरीबी उन्मूलन और असमानताओं में कमी लाने का प्रयास किया जा रहा है। जिस कारण नागरिकों के साथ साथ देश का विकास हो सके और देश दुनिया के देशों में अग्रणी हो सके। योजना के अंतर्गत 5 लाख रुपये तक का वार्षिक स्वास्थ्य बीमा कवरेज लगभग 50 करोड़ से अधिक लाभार्थियों को दिया जा रहा है। इससे गरीब परिवारों को गंभीर बीमारियों के उपचार का आर्थिक बोझ नहीं उठाना पड़ता है, जो सीधे तौर पर गरीबी कम करने में सहायक है। स्वास्थ्य खर्च के कारण गरीब होने वाली आबादी की संख्या में भारी कमी दिखाई दे रही है जो इसी योजना की उपलब्धि है। आयुष्मान भारत के दो मुख्य घटक हैं। एक हेल्थ एंड वेलनेस सेंटर (SDGs) और दूसरा प्रधानमंत्री जन आरोग्य योजना (PM&JAYA) ये दोनों घटक स्वास्थ्य प्रणाली को मजबूत बनाते हैं। HWC प्राथमिक स्वास्थ्य सेवाओं को ग्रामीण और दूरस्थ क्षेत्रों तक पहुँचाते हैं, जिससे मातृ-शिशु स्वास्थ्य, पोषण, टीकाकरण और रोग-नियंत्रण जैसे लक्ष्यों को गति मिलती है। यह योजना अस्पतालों में कैशलेस उपचार, ई-कार्ड, और आयुष्मान मित्र जैसी व्यवस्थाओं के माध्यम से चल रही है जो स्वास्थ्य सेवाओं को अधिक पारदर्शी और सुलभ बनाती है। इसमें निजी और सरकारी दोनों क्षेत्र की भागीदारी ने स्वास्थ्य अवसंरचना को मजबूत किया है। आयुष्मान भारत सामाजिक-आर्थिक असमानताओं को कम करके, गुणवत्तापूर्ण स्वास्थ्य सेवाओं तक समान पहुँच बनाकर सतत विकास लक्ष्यों को प्राप्त करने में महत्वपूर्ण भूमिका निभा रहा है।

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जैव विविधता, जल एवं वन्यजीव प्रबंधन दृ सतत पारिस्थितिकी की आधारशिला

अनुराधा वर्मा

शिक्षा शास्त्र विभाग, ख्वाजा मोइनुद्दीन चिश्ती, भाषा विश्वविद्यालय लखनऊ, उत्तर प्रदेश

शोध सार

वर्तमान समय में पूरा विश्व गंभीर पर्यावरणीय संकटों जैसे जलवायु परिवर्तन, जैव विविधता में कमी, और जल संसाधनों की गिरावट का सामना कर रहा है जिसने मानव जीवन और प्राकृतिक संतुलन दोनों को गंभीर रूप से प्रभावित किया है। जैव विविधता से तात्पर्य केवल पृथ्वी पर जीवन की विविधता से नहीं है, बल्कि यह सम्पूर्ण पारिस्थितिकी तंत्र की स्थिरता, उत्पादकता और मानव कल्याण की नींव है। इसी प्रकार, बेहतर जल और वन्यजीव प्रबंधन भी सतत विकास के लिए अपरिहार्य घटक हैं। जब इन तीनों घटकों अर्थात् जैव विविधता, जल एवं वन्यजीव का एकीकृत दृष्टिकोण से प्रबंधन किए जाता है, तभी एक संतुलित और दीर्घकालिक पर्यावरणीय सुरक्षा सुनिश्चित की जा सकती है। जैव विविधता की हानि मुख्यतः मानव-जनित कारणों जैसे वनों की कटाई, अति-शहरीकरण, औद्योगिकीकरण, कृषि भूमि का अतिक्रमण और प्रदूषण के परिणामस्वरूप हो रहा है। दूसरी तरफ, जल संसाधनों के अत्यधिक दोहन और प्रदूषण ने नदियों, झीलों और भूजल स्तर को गंभीर संकट में डाल दिया है। वन्यजीवों के प्राकृतिक आवासों के लगातार विनाश ने न केवल अनेक प्रजातियों को विलुप्त के कगार पर पहुँचा दिया है, बल्कि खाद्य श्रृंखला और पारिस्थितिक संतुलन को भी बुरी तरह प्रभावित किया है। यह शोधपत्र जैव विविधता, जल और वन्यजीव प्रबंधन के बीच पारस्परिक संबंधों का विश्लेषण करता है तथा यह दर्शाता है कि एक क्षेत्र में ह्रास दूसरे क्षेत्र की स्थिरता को प्रत्यक्ष रूप से प्रभावित करता है। उदाहरणस्वरूप, वनों की कटाई वर्षा चक्र को प्रभावित करती है, जिससे जल संसाधनों में कमी आती है, और इसके फलस्वरूप वन्यजीवों के आवास भी संकटग्रस्त हो जाते हैं। अतः पर्यावरणीय प्रबंधन को “समग्र पारिस्थितिक दृष्टिकोण” (Holistic Ecological Approach) के साथ अपनाना आवश्यक है। अध्ययन में यह भी रेखांकित किया जाएगा कि समुदाय आधारित संरक्षण (Community-based Conservation), एकीकृत जल संसाधन प्रबंधन (IWRM), और वन्यजीव कॉरिडोर नीति (Wildlife Corridor Policy) जैसे उपाय स्थानीय भागीदारी और तकनीकी नवाचार के साथ मिलकर अधिक प्रभावी परिणाम दे सकते हैं। इसके साथ-साथ, पारंपरिक ज्ञान और आधुनिक विज्ञान का संतुलित संयोजन भी संरक्षण नीतियों को अधिक व्यावहारिक और स्वीकार्य बनाता है। इस शोध का निष्कर्ष यह है कि सतत जैव विविधता और जल एवं वन्यजीव प्रबंधन के लिए मात्र सरकारी नीतियाँ पर्याप्त नहीं हैं, बल्कि समाज के प्रत्येक वर्ग जैसे ग्रामीण समुदाय, युवा, महिला समूह, शैक्षणिक संस्थान, और निजी क्षेत्र की सक्रिय भागीदारी अनिवार्य है। शिक्षा, जागरूकता और नैतिक दृष्टिकोण से प्रेरित सहभागिता ही प्रकृति के साथ सामंजस्यपूर्ण सह-अस्तित्व की दिशा में वास्तविक परिवर्तन ला सकती है। अतः यह कहा जा सकता है कि यदि जैव विविधता की रक्षा, जल संसाधनों का संरक्षण और वन्यजीवों की सुरक्षा को एकीकृत रूप से अपनाया जाए, तो न केवल पारिस्थितिक संतुलन को फिर से बेहतर किया जा सकता है, बल्कि मानव कल्याण और हमारी आने वाली पीढ़ियों के लिए एक स्वच्छ, स्वस्थ और स्थायी पृथ्वी का निर्माण भी किया जा सकता है।

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**हिन्दी साहित्य में जलवायु परिवर्तन का विमर्श
पर्यावरणीय नैतिकता के साहित्यिक आयाम**

दीक्षा सिंह

हिन्दी विभाग, ख्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश

शोध सार

वर्तमान समय में जलवायु परिवर्तन समूची मानवता के सामने उपस्थित सबसे गंभीर वैश्विक संकटों में से एक है, जिसने केवल प्राकृतिक तंत्रों को ही नहीं बल्कि सामाजिक, सांस्कृतिक और नैतिक ढाँचों को भी गहराई से प्रभावित किया है। पर्यावरणीय चुनौतियों के इस दौर में हिन्दी साहित्य एक महत्वपूर्ण वैचारिक और सांस्कृतिक मंच के रूप में उभरता है, जहाँ प्रकृति, मानव और नैतिक दायित्वों के बीच जटिल सम्बन्धों की गहन अभिव्यक्ति दिखाई देती है। हिन्दी साहित्य की आरंभिक प्रकृतिपरक परम्परा, रीतिकालीन काव्य से लेकर छायावाद, प्रगतिवाद, नई कविता और समकालीन लेखन, सदैव प्रकृति को न केवल सौंदर्य का स्रोत बल्कि जीवन, संतुलन और मानवीय संवेदना का मूल आधार मानती रही है। छायावादी कवियों (जैसे जयशंकर प्रसाद, सुमित्रानंदन पंत) की रचनाओं में प्रकृति मानवीय चेतना के विस्तार का माध्यम बनती है, वहीं प्रगतिवादी और आधुनिक लेखन में प्रकृति का स्वरूप पर्यावरणीय संकटों और मानव-जनित विनाश की ओर संकेत करता है। समकालीन कविता और कथा-साहित्य में जलवायु परिवर्तन, वनों का क्षरण, जल-संकट, प्रदूषण, असमान विकास मॉडल तथा पारिस्थितिक असंतुलन जैसे मुद्दे प्रमुख विषय के रूप में उभरते हैं। ज्ञानरंजन, निर्मल वर्मा, उदय प्रकाश, ममता कालिया तथा अन्य आधुनिक लेखकों की रचनाएँ इस बात को रेखांकित करती हैं कि पर्यावरणीय संकट मूलतः नैतिक संकट भी है, एक ऐसा संकट जो मानव की उपभोक्तावादी प्रवृत्तियों और प्रकृति से विमुख होते जा रहे जीवन-दृष्टिकोण का परिणाम है। पर्यावरणीय नैतिकता के सन्दर्भ में हिन्दी साहित्य एक महत्वपूर्ण हस्तक्षेप प्रस्तुत करता है। इसमें प्रकृति को 'संसाधन' मात्र न मानकर एक जीवंत, संवेदनशील और सजीव इकाई के रूप में ग्रहण किया जाता है। कई कविताएँ और कहानियाँ यह स्थापित करती हैं कि मानव और प्रकृति के बीच सह-अस्तित्व, परस्पर निर्भरता तथा नैतिक दायित्व का सम्बन्ध स्थापित किया जाना आवश्यक है। यह साहित्य हमें 'सतत विकास', 'सामाजिक-पर्यावरणीय न्याय', 'भविष्य की पीढ़ियों के प्रति जिम्मेदारी' और 'अहिंसक प्रकृति-दृष्टि' जैसे आदर्शों की ओर उन्मुख करता है। हिन्दी साहित्य का यह विमर्श केवल चेतना निर्माण तक सीमित नहीं, बल्कि पर्यावरणीय व्यवहार, जन-जागरूकता और नैतिक पुनर्संरचना की दिशा में भी सक्रिय भूमिका निभाता है। उसका उद्देश्य जलवायु परिवर्तन पर वैज्ञानिक तथ्य और नैतिक मूल्यों का समन्वय स्थापित करना तथा एक ऐसी संवेदनशील सामाजिक सोच विकसित करना है जो पृथ्वी और मानव कल्याण को एक समान प्राथमिकता देती है। यह शोध-पत्र हिन्दी साहित्य में जलवायु परिवर्तन और पर्यावरणीय नैतिकता के उभरते विमर्श का विश्लेषण प्रस्तुत करेगा तथा यह प्रतिपादित करेगा कि साहित्य किस प्रकार मनुष्य को नयी पर्यावरणीय चेतना प्रदान कर सकता है और एक उत्तरदायी, नैतिक एवं टिकाऊ भविष्य की ओर प्रेरित कर सकता है।

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योगेंद्र कुमार सिंह

हिन्दी विभाग, खवाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश

शोध सार

कविता समाज के आदर्श का निर्माण करती है और उनके टूटने की अभिव्यक्ति भी होती है। हिंदी काव्य की यात्रा में आदिकाल, भक्तिकाल, रीतिकाल और आधुनिक काल में प्रकृति के विभिन्न प्रतीक आलंबन और उद्दीपन के रूप में अधिक प्रयोग किल गल हैं। किंतु आधुनिक काल की छायावादी कविता प्रकृति को केंद्र में रखकर मनुष्य के जीवन के अनगिनत पक्षों की दार्शनिक मनोवैज्ञानिक और आधुनिक व्याख्या करती है। कविता में इस सीमा तक पर्यावरण आदर्श के रूप में प्रकट होता है, किंतु औपनिवेशिक काल से ही भारत में पनपी औद्योगिक व्यवस्था ने स्वतंत्रता के बाद प्रकृति और विकास के बीच होने वाले सामान्य संतुलन को खो दिया तथा पर्यावरण को दरकिनार कर विभिन्न प्रकार के विकास कार्यों को गति प्रदान की गई। यहां पर प्रकृति के आदर्श कविता में टूटने शुरू हो जाते हैं और सन 1980 के दशक के बाद से प्रकृति का विघटन और मनुष्य की बेपरवाही हिंदी काव्य संवेदना में गहराई से प्रकट होती है। इस अनुभूति को यथार्थ और स्वयं के भोगे हुए अनुभव के साथ आदिवासी कवि बड़ी प्रखरता के साथ सामने रखते हैं। क्योंकि यह कवि आदिवासी जीवन के सत्य को जी रहे हैं और प्रकृति के दाहे न से उत्पन्न संकटों को भागे भी रहे हैं। यही कारण है की प्रकृति के विमर्श और मूल्यों के संकट की भोगी हुई यथार्थ परक अभिव्यक्ति आदिवासी काव्य से बेहतर कहीं और दिखाई नहीं पड़ती। यह कविता हिंदी काव्य के सार्वभौमिक स्वरूप का लक और विस्तार करती है, तो दूसरी ओर काव्य धर्म के द्वारा पूरी मनुष्यता को बचाल रखने की विश्व कल्याणकारी कोशिश भी करती है। कवि निर्मला पुतुल, जैसैंटा केरकेट्टा, अनुज लुगुन, वंदना टेटे, सुशीला समद, रामदयाल मुंडा, महेंद्र भगत, भगवती प्रसाद दूडू जैसी अनेक कवि अपने काव्य अनुभवों को पर्यावरण विमर्श की मिनट से कविताओं में साझा करते हैं, जिसका आलोचनात्मक अनुशीलन करना हिंदी समीक्षा और अकादमिक जगत की अनिवार्य आवश्यकता है।

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सिनेमा में पर्यावरणीय चेतना: 'कड़वी हवा' के संदर्भ में

सुमन सिंह एवं मंजुल कुमार सिंह

हिंदी विभाग, दयानंद गर्ल्स-पी.जी. कॉलेज, कानपुर, उत्तर प्रदेश

शोध सार

भारतीय समाज में उपभोक्तावादी जीवन शैली अपनाने के कारण पर्यावरण को दिन-प्रतिदिन बहुत हानि पहुँच रही है। इसके चलते हमें कई नई चुनौतियों का सामना करना पड़ रहा है। समाज को जागरूक बनाने के लिए भारतीय सिनेमा ने भी कुछ फिल्में बनाई हैं, जो संदेश देती हैं कि हमें पर्यावरण के संरक्षण के लिए चल रहे सरकारी और गैर सरकारी अभियानों में बढ़-चढ़कर हिस्सा लेना चाहिए। ये फिल्में बताती हैं कि अगर हम अभी जागरूक नहीं हुए तो भविष्य में हमें किन-किन प्राकृतिक मुसीबतों का सामना करना पड़ सकता है। बड़े पर्दे यानी सिनेमा में सामाजिक चेतना भले ही पूरी शिद्यत से अपरनी मौजूदगी दर्ज कराती रही है, लेकिन पर्यावरण के लिए विषय उतने मुखर नहीं रहे हैं। हालांकि पर्यावरण के विषय बीच में जुगनुओं की भांति टिमटिमाए जरूर हैं। मौजूदा दौर का सिनेमा मात्र बड़े पर्दे तक सीमित नहीं रहा है और निर्माता निर्देशकों को ओटीटी जैसे मंच मिले हैं। वे अपने पसंदीदा विषयों को पर्दे पर उतारने में अधिक तत्पर भी दिखे हैं लेकिन अब तक मुख्यधारा के सिनेमा में जगह नहीं बना पाने वाला पर्यावरण का विषय इस दौर की फिल्मों की मुख्य विषयवस्तु से भी बहुत दूर ही रखा गया है। पर्यावरण पर केंद्रित सिनेमा भले ही दर्शकों के व्यापक वर्ग को लक्षित नहीं कर सकता हो लेकिन संजीदा दशकों तक पहुँचने में जरूर सफल हो सकता है। पर्यावरण के विषय अब हमको गहराई से प्रभावित करने लगे हैं और मौजूदा दौर के सिनेमा द्वारा उसे नजरअंदाज करने की प्रवृत्ति हमारी सामूहिक विफलता बन सकती है। सहायक विषय के रूप में पर्यावरण चेतना शुरुआत से ही सिनेमा में मौजूद रही है परंतु इसे अब मुख्यधारा में लाने की आवश्यकता है। 'कड़वी हवा' फिल्म जलवायु परिवर्तन और पर्यावरण क्षरण के गंभीर प्रभावों पर केंद्रित है। यह फिल्म सूखे से जूझ रहे बुंदेलखंड के किसानों और बाढ़ की चपेट में आ रहे ओडिशा के तटीय इलाकों में निवासियों की कहानियों को फिल्म के मध्यम से दिखाती है कि कैसे पर्यावरण संकट के परिणाम अलग-अलग समुदायों पर असमान रूप से पड़ते हैं। फिल्म दर्शाती है कि पर्यावरण के साथ छेड़छाड़ का परिणाम विनाशकारी हो सकता है, खासकर हाशिए पर पड़े समुदायों के लिए। फिल्म में एक तरफ सूखाग्रस्त इलाके के पात्र दिखाए गए हैं जिन्हें बारिश की सख्त जरूरत है, तो दूसरी तरफ बाढ़ से जूझ रहे तटीय इलाकों के लोग हैं जो बढ़ते जलस्तर से परेशान हैं। यह फिल्म जलवायु परिवर्तन से उत्पन्न होने वाली असमानताओं को उजागर करती है। सूखे के कारण किसानों की फसलें बर्बाद होती हैं, वे कर्ज में डूब जाते हैं और कई तो आत्महत्या तक कर लेते हैं। यह फिल्म पर्यावरण आपदाओं के कारण उत्पन्न होने वाली मानवीय और सामाजिक कीमत को दर्शाती है। फिल्म प्रकृति के साथ मानवीय हस्तक्षेप को एक गंभीर समस्या के रूप में प्रस्तुत करती है, जिसके भयानक परिणाम हो सकते हैं। यह फिल्म जलवायु परिवर्तन के कारण लोगों को अपने घर छोड़कर पलायन करने और नए स्थानों पर रहने के लिए मजबूर होने जैसी स्थिति को दर्शाती है, जिसे 'जलवायु शरणार्थी' कहा जाता है। प्रस्तुत शोध में समाज में पर्यावरण चेतना के लिए सिनेमा की भूमिका को दर्शाते हुए सिनेमा में पर्यावरण चेतना एवं संवेदना का विश्रलेषण किया गया है। साथ ही इसकी दशा एवं दिशा को समझने का प्रयास किया गया है।

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In order to serve the Nature and Society for a better future, the Glocal Environment & Social Association (GESA) is constituted. Its headquarter is located in New Delhi. Its main aim is to develop and promote 'global thought and local action' ideology to save the nature. It organizes the seminars; workshops etc. to aware and educate the people on blazing environmental and social issues. The GESA felicitates the persons and organizations for their outstanding services rendered in various fields of agriculture, arts, biodiversity conservation, commerce, culture, education, environment, healthcare, humanities, literature, mass communication, music, patriotism, peace and harmony, science, sports, technological innovations and other social services. GESA confers following categories of awards and honours to its members:

1. Lifetime Achievement Award (**Above 55 years of age**)
2. Hon. Fellowship/ Fellowship (FGESA)
3. Dr. APJ Abdul Kalam Green Environment Promotion Award
4. Dr. Sarvepalli Radhakrishnan Education Promotion Award
5. Chaudhary Charan Singh Award for Agricultural Innovations
6. Sardar Patel Glocal Award for Social Awareness
7. Lal Bahadur Shastri Glocal Award for Biodiversity
8. Senior Scientist Award (**Above 40 years of age**)
9. Best Faculty Award for Teaching/Research Innovations
10. Distinguished Service Award / Distinguished Teacher Award (**Crop, Plant Protection, Horticulture, Fisheries, Home Science, Social Science, Animal Science, Life Science etc.**)
11. Innovative Educationist Award/ Agriculture Extensionist Award
12. Teacher of the Year / Extension Professional of the Year / Doctor of the Year Award
13. Technological Innovations Award
14. Paryavaran Ratna Puraskar
15. Vigyan Bhushan Puraskar
16. Sahitya Shri Samman
17. Young Scientist/Young Researcher Award (**Below 35 years of age**)

Note: Life Membership of GESA is mandatory for above awards. Each awardee receives an angavastram, a potted plant, a multicoloured & delightful award certificate and a high quality entrancing memento during its annual session or conference. GESA Award selection is mainly based on applicant's biodata. For detailed guidelines, please log on to website: <http://www.gesa.org.in> [Email id: president.gesa@gmail.com]



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