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University of Delhi



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MESSAGE



It gives me immense pleasure to know that the Institute of Home Economics, a constituent College of the University of Delhi is organizing a National Conference on the theme of “Health, Gender, and the Environment: Intersections Towards Meeting the SDGs”, which is one of the most relevant and appropriate theme in the contemporary global scenario.

I am sure that the National Conference will act as a befitting platform to deliberate upon the relevant Sustainable Developments Goals of Good Health, Gender Equality, Clean Water and Sanitation, Renewable Energy, Climate Action among others while highlighting the research outcomes and further exploring the respective knowledge domains in its true perspective.

I believe that the Conference will also help in finding an effective and holistic solution for gender equality in the context of environment, public health and attainment of the Sustainable Developments Goals through appropriate partnerships at all levels. I feel that the Conference would further augment the quality research and collaboration to address the present day challenges concerning these issues.

Let me take this opportunity to convey my best wishes to the distinguished participants of this National Conference for a meaningful deliberation on the pertinent issues and the Organising team of the Institute of Home Economics for organizing this National Conference of contemporary relevance.

Yogesh Singh 21/4/25

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University of Delhi

Prof. Shri Prakash Singh
Director, South Delhi Campus



MESSAGE FROM THE DIRECTOR
UNIVERSITY OF DELHI SOUTH CAMPUS



I am delighted to learn that the Institute of Home Economics is organizing a national conference on Health, Gender, Environment: Intersections towards SDGs. This is a commendable initiative of the Institute in creating awareness among the students and staff towards SDGs and promoting interdisciplinary research, innovation, and community engagement.

The conference theme is apt in the current context, as it addresses the critical intersections of Health, Gender, and Environment in achieving the Sustainable Development Goals (SDGs). I am confident that this conference will provide a valuable platform for scholars, researchers, policymakers, and practitioners to share knowledge, expertise, and best practices. The conference is also an excellent opportunity for participants to deliberate upon the challenges and opportunities to meet the SDGs and to encourage thought provoking discussions for the way forward in adopting those.

Please accept my warmest congratulations on taking this initiative. I wish the conference organizers and participants all the best for a successful and enriching event.

Prof. Shri Prakash Singh

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It gives me great pleasure to welcome you all to the National Conference on *Health, Gender, and the Environment: Intersections towards Meeting the SDGs*, being organized at the Institute of Home Economics on April 4, 2025. This conference provides an excellent platform for faculty and students to engage in meaningful discussions, share their research, and explore the critical intersections between gender, environment, climate change, and well-being through the One Health approach.

In today's world, addressing these interrelated challenges is essential for sustainable development. By bringing together researchers, academicians, and policymakers, this conference aims to foster cross-sectoral collaborations that contribute to impactful policies and initiatives. The discussions held here will not only enhance academic understanding but also strengthen efforts toward achieving the Sustainable Development Goals (SDGs).

I extend my best wishes to all participants and organizers for a successful and enriching conference. May this event inspire new ideas, partnerships, and solutions for a healthier and more sustainable future.

Prof. Neeta Sehgal
Chairperson
Research Council
University of Delhi



I am delighted to note that the Institute of Home Economics is organizing a National Conference on ‘Health, Gender and the Environment: Intersections towards meeting the Sustainable Development Goals (SDGs)’ on Friday, April 4, 2025. The conference is expected to cover the thematic areas related to gender, environment, climate change adaptation and mitigation, human health and well-being.

The conference will provide a platform to young researchers, academicians, and faculty members to present their research on the above themes and to form networks. It will also acquaint the participants about the impact of policies, programmes and initiatives taken by the Central Government and various state governments for the human well-being in the country. It will foster cross-sectoral collaborations for meeting the SDGs and building sustainable societies.

I appreciate the Director of the Institute and the conference organizing committee for showing a keen interest in organizing a successful Conference and contributing new ideas and research findings. I wish them for their endeavors to spread knowledge.

With kind regards

Prof. Surender Kumar

Chairman, Governing Body

Institute of Home Economics

University of Delhi



I am excited to learn about the upcoming conference organized by the Institute of Home Economics on **"Health, Gender, and Environment: Intersections Towards SDGs"** on April 4, 2025, which aims to explore the interconnectedness of health, gender, and environmental factors and how these intersections can contribute to achieving the UN Sustainable Development Goals (SDGs).

As we all know, the relationship between health, gender, and the environment is complex, and it is critical that we collaborate across disciplines to understand these intersections and their implications. This conference will provide a platform for researchers, policymakers, and activists to come together and discuss solutions that can drive positive change in our communities and beyond.

The conference will dive deep into pressing issues such as environmental impacts on health, gender disparities and how these factors influence broader global outcomes relevant to SDGs. We will hear from experts in microbiology, environmental science, gender studies, and public health, providing a holistic approach to the challenges we face in achieving the SDGs.

I wish all students and faculty of IHE, all the best for the successful completion of this conference.

Prof. Rajeev Kaul
Head
Department of Microbiology
University of Delhi
South Campus



I am pleased to hear about an exciting and timely conference hosted by the Institute of Home Economics on "**Health, Gender, and Environment: Intersections Towards SDGs.**"

This conference will be a key platform for exploring how health, gender equality, and environmental sustainability intersect to promote the achievement of the Sustainable Development Goals (SDGs).

The challenges of achieving SDGs are multifaceted and deeply interlinked with various societal factors. This conference aims to highlight how the interplay between gender, health, and environmental issues plays a pivotal role in fostering a sustainable and equitable future. Through thoughtful discussions and presentations, we will examine how these intersections impact our communities, particularly in the realms of nutrition, family well-being, climate change, and access to healthcare.

I congratulate IHE for this upcoming conference and encourage all students and faculty to participate in this meaningful event.



Prof. Manoj Singh
Head
Department of Home Science
University of Delhi



It is heartening to know that the Department of Development Communication, Extension & Journalism in association with the Department of Microbiology are organizing the National Conference on “Health, Gender, and the Environment: Intersections towards Meeting the SDGs” on April 4, 2025.

This conference will provide an invaluable platform to our students and faculty to explore the critical intersections of health, gender, and the environment - the three key pillars that are inextricably linked to the well-being of individuals, communities, and our planet as a whole. From gender equity in healthcare to environmental sustainability and climate action, these topics are central to building a just, healthy, and thriving world for the present and future generations.

At our Institution, we strongly believe that meaningful progress can only be achieved through collaboration, interdisciplinary dialogue, and a deep understanding of the interconnections between human health, environmental stewardship, and gender equality. By engaging in robust discussions and exchanging knowledge, we can identify actionable solutions and drive the systemic change necessary to meet the SDGs.

My best wishes to the Departments for the success of this event.

Prof. Radhika Bakhshi
Director,
Institute of Home Economics
University of Delhi



ABOUT THE COLLEGE

Founded in 1961, the Institute of Home Economics (IHE), is a premier college of the University of Delhi imparting education to women. The college offers a bouquet of courses including biochemistry, microbiology, food technology, elementary education, journalism and home science at the under graduate level. The college also offers post-graduation and PhD programs in different disciplines of Home Science. Some of the achievements of the college in the recent years include NAAC 'A++' certification (2024-2029), Star College Scheme grant from Department of Biotechnology (2017-2022), FIST Grant (2016-2021) and the recent CURIE grant from the Department of Science and Technology (DST). The faculty at IHE has been actively engaged in multi-disciplinary research projects funded by national and international agencies such as UNDP, Wellcome Trust, Medical Research Council, UK; British Council, New Zealand Research Council, DST, DBT, ICMR, MoEFCC, UGC, World Bank, ICSSR, Ministry of Women and Child Development (GOI) and Tata Trust and University of Delhi. Some of the significant areas of research have been management of non-communicable diseases, adult and child nutrition, climate change, poverty, gender, ICTs, adolescent health and geriatric nutrition thereby offering newer perspectives to problems while suggesting correctives at the level of policy making and practice.

The college has a strong focus on the various domains of development which can transform India to a more developed nation. The college organized this conference to generate and bring together various concerns related to gender equality, environmental challenges including climate change and impacts on health as well as strategies to overcome the challenges. Besides academics, the college has facilities for cultural activities, sports, inter-college events, community outreach programs, and workshops and seminars. The college has an elected Student's Council and holds various cultural functions from time to time to empower students with leadership qualities and give them opportunities to showcase their talents. The college upholds the ideals of women's emancipation and empowerment. It provides the opportunity to the young women to study in a healthy stimulating environment and mold themselves into fine human beings who are equipped with the professional skills required in the work space. Each course of study at the college incorporates a robust practical component, complemented by exposure to emerging trends and developments through seminars, workshops, and lectures delivered by experts in relevant fields. The course design also integrates essential elements such as field trips, study tours, and internships, emphasizing their significance in providing valuable hands-on experiences. Our goal is to equip students with a comprehensive set of knowledge and skills, enabling them to evolve as professionals capable of meeting the current and future needs of society.



ABOUT THE CONFERENCE

As countries strive towards meeting the SDGs by 2030, it is apparent that the progress across the globe is uneven. As per estimates, only 16% targets of SDGs are well on track while in the rest 84% targets, the countries are still struggling to meet them. India ranks 109 out of 193 member states in SDG attainment with an index value of 63.99 indicating percent SDG achievement as per the SDG report published in 2024. While major challenges remain in fulfillment of many goals, health and well-being of populations are threatened by environmental hazards including climate related crisis and gender-based inequalities in society remain to be major constraints in the overall development of the nation. The conference envisages to focus on the intersections between the themes of Health-related concerns and challenges as well as the Gender based inequalities in society which are often exacerbated by environmental hazards including climatic changes and extremes. These in turn hinder progress, and deepen the existing social and economic disparities in societies. This conference aims to delve deep into creating understanding of the critical relationships between the triple domains of environmental challenges, issues of gender equality as well as health and well-being of populations.

Conference Objectives

The conference aims to meet the following objectives:

- Create awareness and generate knowledge about the impact of environmental changes and challenges on health and well-being of populations especially women.
- Aggregate evidence gathered from research studies, policies, programs and initiatives by Government, corporate, non-government bodies and private bodies to address health concerns of populations amidst environmental degradation including climatic changes and extremes.
- Foster cross sectoral collaboration for a sustainable future which addresses these concerns on a priority basis.



National Conference

Health, Gender, and the Environment: Intersections towards meeting the SDGs

PROGRAM SCHEDULE



TIME	PROGRAM	VENUE
9-9:30 A.M.	Registration	Block A
9:30-11:15 A.M.	Lamp Lighting & Saraswati Vandana	Foyer
	INAUGURATION ● Welcome Address by Prof. Savita Aggarwal (Convenor) ● Address by Prof. Radhika Bakhshi (Director, IHE) ● Release of Abstract Book	Conference Room
	KEYNOTE SESSION 1 ● Kalpana Yadav, Gender and Human Rights Analyst, UNFPA	
	KEYNOTE SESSION 2 ● Dr. Sivaram V S Mylavarapu, Professor, Regional center for Biotechnology Faridabad	
	VOTE OF THANKS ● Dr Kohinoor Kaur	
11:15 - 11:45 A.M.	HIGH TEA	Guests, Faculty & Delegates: Foyer UG Students: GCR
11:45- 1:30 P.M.	Technical Session 1: Gender, Climate Change, Health, & Well-Being Session Chair 1: Prof. Heena Bijli Professor of Community Resource Management & Extension School of Continuing Education, IGNOU Session Chair 2: Professor Shikha Kapur, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia Session Co-Chair: Prof. Parveen Pannu Professor, Department of Development, communication Extension & Journalism, IHE	Conference Room
	Technical Session 2: Gender, Gender Equality, & SDGs Session Chair: Ms. Vandana Sharma	Staff Room



	Deputy Director, Nutrition Vertical, NIPCCD, New Delhi Session Co-Chair: Dr. Yuki Azaad Tomar Department of Development, Communication Extension & Journalism, IHE	
	Technical Session 3: One Health Approach & Well-Being Session Chair: Prof. Sivaram V S Mylavarapu Professor, Regional center for Biotechnology Faridabad Session Co-Chair: Prof. Sunil Srivastava Professor, Department of Microbiology Swami Shradhanand College, University of Delhi	Room No: 117
	Technical Session 4: Ideathon Session Chair: Dr. Richi V Mahajan Scientist 'D', Department of Biotechnology Ministry of Science and Technology, CGO Complex, Lodhi Road, New Delhi Session Co-Chair: Dr. Harshita Mittal Senior manager at Strategy and Public Policy Research & Toxicology, Humane World for Animals	Room No: 103
1:30- 2:15 P.M.	LUNCH	Foyer
2:15 - 3:45 P.M.	Technical Sessions Continues	Conference Room, Staff Room, 117 & 103
3:45-4:00 P.M.	TEA	Foyer
4:00- 4:30 P.M.	VALEDICTORY SESSION ● Prize distribution ● Vote of thanks by Dr Jagriti Kher	Conference Room



Table of Contents

S.No.	Name	Topic	Page No
1.	Dr. Jagriti Kher, Institute of Home Economics, University of Delhi	Do climatic stresses and extremes pose greater risk to poor urban women? A study of slums in a metropolitan city in India	22
2.	Khushi, Mimansha, Neeraja, Nishita, Delhi University	Awareness and Usage of Menstrual Hygiene Practices Among College Students in Delhi	23
3.	Himanshi Negi, IIPA, New Delhi	Assessing the Impact of Climate Change on Health, Nutrition, and Agriculture: Evidence from NFHS Data	24
4.	Ms. Kanika Batra, Dr. Jagriti Kher, Institute of Home Economics, University of Delhi	Do policies and programs related to housing and basic services help women in better adaptation to climate change? A Gender Audit Approach	25
5.	Rajnandani kumari & Dr. Suvidha, Banasthali Vidhyapith, Rajasthan	A Systematic Review: Role of Education in Empowering Women	26
6.	Ms. Aakriti Tiwari, Banaras Hindu University	The Study of Thrift Fashion: Opportunities and Challenges in Promoting Responsible Consumption and Production for Sustainable Development.	27
7.	Prof. Yuki Azaad Tomar, Aditi Verma & Prabhjyot Kaur, Institute of Home Economics, University of Delhi	Private FM Radio and Sustainable Development Goals: A Content Analysis of radio content	28
8.	Sunnyrudh Singh, Punjab Agricultural University, Ludhiana, Punjab	AI in agriculture: Sowing seeds of innovation for a smarter future	29
9.	Ms. Bhumika Anand & Prof. Archana Kumar, Deputy	Evaluating the Efficacy of the 'Sameer' App in Promoting Air Pollution Awareness and	30



	Communication Manager, M3M Foundation & Lady Irwin College New Delhi	Engagement among Teachers in Delhi	
10.	Neha Vishwakarma, Barkatullah University, Bhopal	Millets and Multigrains: An Environmentally sustainable Approach to Health, Nutrition, and Food Security,	31
11.	Athar Ud Din & Shazana Andrabi, Islamic University of Science & Technology, Jammu & Kashmir	Redefining Gender Vulnerability: Towards Inclusive Legal Protection in International Law,	32
12.	Khalida Ziya, Aligarh Muslim University	The Gendered Burden of Malnutrition: Addressing Undernutrition and Obesity Among Women and Children,	33
13.	Bhavya Chopra, Upasana Seth, Aditi Maha Vidhyalaya, University of Delhi	Consumers' Food Safety Concerns at Higher Education Institutes	34
14.	Ankita & Upasana Seth, Aditi Maha Vidhyalaya, University of Delhi	Biofortified Pearl Millet: A Climate-Resilient Crop for Addressing Micronutrient Deficiencies in Vulnerable Populations	35
15.	Astha Kanjlia, Keshav MahaVidhyala, University of Delhi	Artificial Intelligence (AI) enabled Chatbots: A Sustainable Approach of Waste Management for Smart and Circular Cities	36



Session 2: Gender, gender equality & SDG's

S.No.	Name	Topic	Page No
1.	Ms. Geetanshi & Dr. Jagriti Kher, Institute of Home Economics, University of Delhi	Analysis of impact of selected Economic empowerment schemes on women's climate change related adaptation: A Gender audit approach	38
2.	Ms. Nida & Raisa Khan, Jamia Millia Islamia, New Delhi	Media, ICTs and Indian Knowledge Systems for Viksit Bharat	39
3.	Lt. (Dr) Debahuti Brahmachari, Janki Devi Memorial College, University of Delhi	Unlocking the Impact of SDG 3 and Sustainability	40
4.	Dr. Akshima Sharma, Institute of Home Economics, University of Delhi	Impact of digital skill training on the uptake of ICT for health services by rural women (DCE)	41
5.	Ms. Maneesha Gaur, Lady Irwin College, University of Delhi	Assessment of safety compliance on-site for safety of construction workers	42
6.	Ms. Ishani Subudhi, Institute of Home Economics, University of Delhi	Design development using Indian knowledge systems: preserving and commercializing gond art for viksit bharat 2047	43
7.	Mr. Chetan Kumar, Jamia Millia Islamia, New Delhi	Strategies for women empowerment and gender equality Gender equality and empowerment of refugee women	44
8.	Ms. Neeti Vaid, Prof. Savita Aggarwal, Institute of Home Economics, University of Delhi	Do training programmes in Digital Literacy meet the gender specific needs of NEET girls and women?	45
9.	Himani Bharat Institute of Home Economics, University of Delhi	Profiling of youth for Vikshit Bharat: Insights for a pilot study	46



10.	Ms. Nidhi Marothiya & Sw. Dr. R. S. Tolia, Pithoragarh, Uttarakhand	Social stigma and child abuse in Uttarakhand: A multi-stakeholder approach for behaviour change and social policy	47
11.	Ms. Humaira Aftab Dr. Farheen Choudhary, Jamia Millia Islamia, New Delhi	Gender Equality and Occupational Health: Opportunities and Challenges in Achieving SDGs—A Case of Women Workers in the Lock Industry	48
12.	Ms. Sukriti Srivastava, Ritu Singh & Dudati Akhila, Pant Nagar, Uttarakhand	Fear, Procrastination, and Progress: Turning Challenges into SDG Opportunities	49
13.	Ms. Akshita Tripathi, Allahabad University	Sustainable fashion intention and practice forecasting: A behavioral approach	50
14.	Ms. Dudati Akhila, Ritu Singh, Sukriti Srivastava, GB Pant University, Uttarakhand	Social media Influencing Young Women's Decision Making and Aspirations: FoMO's take on Women Empowerment	51
15.	Ms. Rashmi Dhasmana, T.G Rupa, Sushma Goel, Manisha Sabharwal, Lady Irwin College, University of Delhi	Policies and politics along the plastic life cycle	52
16.	Ms. Vidhi Choski, Dr. Urvashi Mishra & Ms. Poripurna Goswami, Baroda University	Assessment of mechanical injuries experienced by the respondents engaged in holding decorative umbrella light during baraat	53



Technical Session 3: One Health Approach & well Being

S.No.	Name	Topic	Page No.
1.	Ms. Niyati Sabharwal, Nitya Tongaria, Vandana Gupta, Ram Lal Anand College, New Delhi	Antimicrobial Resistance in <i>Klebsiella</i> : An Escalating Challenge and Possible Remedies	55
2.	Ms. Rupa Rani Bhowmik, Sakshi Mishra, Dr. Preeti Verma, Shaheed Rajguru College of Applied Sciences for Women, New Delhi	Diversity of Hydrocarbon-Degrading Microorganisms: Ecological Significance, Mechanisms, and Applications	56
3.	Ms. Angkita Mishra, Home Science, Department of Vikriti Vigyan, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University	A review of the critical environmental factors in the pathogenesis of psoriasis with special reference to nutrition.	57
4.	Ms. Aakanksha Agrawal, Sunita Aggarwal, Chanchal Dagur, Sunil Pabbi, Institute of Home Economics, University of Delhi	Exploring Phycobilin Pigments as Sustainable Alternatives to Synthetic Textile Dyes	58
5.	Ms. Nitya Rastogi, Kumar Ankush, Ujjwalkant Singh, Kartikey Bhatt, Nidhi S. Chandra, Ram Lal Anand College, New Delhi	One Health Perspective on Antimicrobial Resistance in <i>Clostridium difficile</i> : The Promise of Phage Therapy	59
6.	Ms. Amrita Varshney, Syed Sahil Al Farish, Shalini Swami and Sunila Hooda, Ram Lal Anand College, New Delhi	Synergistic Bioremediation of Plastics and Wastes by Delhi landfill microbiome: A step towards Sustainability	60
7.	Ms. Anushka Bhardwaj, Nikita Kumari, Preeti Verma, Shaheed Rajguru College of Applied Sciences for Women, New Delhi	Vaginal Microbiome Under Threat: The Effect of Feminine Hygiene Products	61
8.	Ms. Karuna Singh, Dayalbagh Educational Institute, Agra	Probiotics and Mental Health: Investigating the Stress-Reducing Potential of Curd	62
9.	Ms. Harleen Kaur Setia, Jaipur National University, Jaipur	"Data Mining Techniques in Food Safety: Analysing Microbial Data for the Detection of Irradiated Foods"	63
10.	Ms. Naaisha Raina, Bhaskaracharya College of Applied Sciences, New Delhi	Microbiome and metabolic health: Gut dysbiosis in PCOS and its role in insulin resistance	64



11.	Ms. Anubha Gupta, Sunita Aggarwal, Indira P. Sarethy, Jaypee Institute of Information Technology	Sustainable Packaging of Fermented Food(s)	65
12.	Ms. Simran Gupta, Ms. Karuna Singh, Ms. Madhulika Gautam, Dayalbagh Educational Institute, Agra	Nettle (<i>Urtica dioica</i>) as a Sustainable Nutritional Intervention for Metabolic Disorders: A Review	66



Session 4: Ideathon Competition

S.No.	Name	Topic	Page No
1.	Ms. Priya Sagar, Institute of Home Economics, New Delhi	Universal Artificial Blood Development	68
2.	Ms. Anvesha Singh, Institute of Home Economics, New Delhi	Rubisco-Based Biocatalytic Filters for On-Vehicle CO ₂ capture	69
3.	Ms. Vaishnavi Bhardwaj, Institute of Home Economics, New Delhi	Increasing illness due to environmental crises	70
4.	Ms. Varni Rathor, Shyama prasad mukherji college for women, New Delhi	Impact of climate on development (Health, Nutrition, Agriculture, Resources and Environment)	71
5.	Ms. Mrigakshi Malhotra, Institute of Home Economics, New Delhi	The Living Chimney: Harnessing Microbes for Purification	72
6.	Ms. Bisleen Kaur, Institute of Home Economics, New Delhi	Combating antimicrobial resistance: targeting essential bacterial metabolism	73
7.	Ms. Tanushree Biswas and Ms. Astha Singh, Institute of Home Economics, New Delhi	Using Antimicrobial Resistance Strategies to Strengthen Marburg Virus Vaccines	74
8.	Ms. Damanpreet Kaur, Institute of Home Economics, New Delhi	Microbial Skin Coating for UV Protection & Skin Repair	75
9.	Ms. Shivanjali Dikhit and Ms. Damanpreet Kaur, Institute of Home Economics, New Delhi	Microbial self-healing roads & buildings	76
10.	Ms. Anvi Nigam, Institute of Home Economics, New Delhi	Gallbladder Cancer – A Silent Threat Tied to Our Environment and Health	77
11.	Ms. Mahak Gupta and Nandana K. S., Institute of Home Economics, New Delhi	A shift towards the Algae based Pads	78
12.	Ms. Oindrilla Chatterjee, Institute of Home Economics, New Delhi	<i>Nannochloropsis</i> as an environmental marvel	79



Technical Session 1: Gender, Climate Change Health & Well Being



Do climatic stresses and extremes pose greater risk to poor urban women? A study of slums in a metropolitan city in India

¹Jagriti Kher & ²Savita Aggarwal

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Abstract

Climate change is a global problem but is a major challenge for developing countries like India. The urban and rural poor women who bear the brunt of these climatic impacts due to their greater exposure to hazards and limited adaptive capacity. As per World Bank, 2020, 49% urban population in India lives in slums. It is very important to pay special attention to this group especially women who face multiple deprivations in society. The present study has been conducted to capture the gender-based differentials in vulnerability/risk to climate change faced by the urban poor on statistically defined sample of 100 slum families living across five districts in Delhi using the index-based approach.

A review of existing indices depicted that they either did not capture the gender dimension of climate change, or were not specific to climate change. Therefore, a new index called Gender based Climate Risk Index (GCRI) was developed. This was based on IPCC AR5 risk assessment framework in combination with suitable Gender Analysis Framework. The GCRI had 4 sub-indices namely Hazards, Exposure, Sensitivity and Lack of adaptive capacity. The index used a combination of primary and secondary data. The primary data was collected through questionnaire while the secondary data was taken from national reports. To permit comparison maximum and minimum values were taken from the State level data of India.

The results revealed that despite facing same level of hazards, slum population especially women face greater risk (28 percent) to climatic changes as compared to Delhi city as a whole. This was due to their greater exposure, sensitivity due to poor health and lack of adaptive capacity due to low literacy levels and inadequate economic capacity. It is therefore important to incorporate the gender perspective in the slum upgradation plans as well as enhance the adaptive capacity of women to face such climatic challenges.

Keywords: Gender, Risk assessment, Vulnerability, Climate change



Awareness and Usage of Menstrual Hygiene Practices Among College Students in Delhi

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Abstract

Menstrual hygiene is a fundamental aspect of women's health, yet it remains overshadowed by stigma, misinformation, and inadequate resources. This study explores the awareness and usage of menstrual hygiene practices among college students in Delhi, emphasizing sustainability, accessibility, and societal taboos. A survey of 60 female students from Delhi University, conducted through structured questionnaires and focus group discussions, revealed that while 90% used non-plastic sanitary pads, only 7% opted for menstrual cups and 3% for tampons, reflecting hesitancy towards sustainable alternatives. Despite 83.3% of respondents being aware of the health risks associated with poor menstrual hygiene, over 70% had never benefited from government schemes promoting safer practices. Disposal remains a challenge, with 45% encountering clogged washrooms due to improper disposal methods. Although 75% were aware of sanitary napkin vending machines, many lacked the knowledge to use them effectively. Additionally, 43% of respondents faced societal restrictions during menstruation, reinforcing the deep-rooted taboos surrounding this natural process. To address these issues, future actions should prioritize comprehensive menstrual health education in schools and colleges, ensuring open discussions that include male participation to break societal taboos. Awareness campaigns should highlight sustainable alternatives such as menstrual cups and cloth pads, promoting their adoption through workshops. Strengthening disposal infrastructure is essential, with the installation and maintenance of sanitary waste bins in educational institutions. Additionally, improved implementation and monitoring of government schemes will ensure menstrual hygiene products and resources reach those in need. Research should also assess the effectiveness of menstrual health programs and vending machines in colleges. Expanding studies beyond Delhi University will provide a broader understanding of menstrual hygiene challenges across diverse socio-economic and regional contexts. By implementing these actions, we can foster a more informed, inclusive, and sustainable approach to menstrual health management.

Keywords: Menstrual health and hygiene management at Delhi University, Menstrual hygiene practice, Sanitary napkin disposal, Social Taboos and Stigma, Sustainability in Menstrual Health



Climate Change and Airborne Pollutants: Unveiling Public Health Risks through NFHS Data Analysis

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Abstract

Climate change is not only an environmental issue but also a significant public health challenge, intensifying air pollution and its associated health risks, particularly in vulnerable regions. This study explores the intersection of climate change and public health by analyzing data from NFHS-3, NFHS-4, and NFHS-5 to assess the impact of air pollution on respiratory conditions, household environments, and maternal and child health. Key parameters such as cooking fuel usage, acute respiratory infections, asthma prevalence, and birth outcomes will be examined to understand the broader implications of air quality on well-being. In 2019, air pollution was responsible for approximately 1.67 million deaths in the country, underscoring its critical impact on public health. Additionally, research indicates that 7.2% of all deaths in India are attributable to daily PM_{2.5} exposure. These findings emphasize the urgency of addressing air pollution to improve health outcomes. The findings will provide insights into how household conditions and socio-economic disparities influence exposure to air pollution, highlighting the need for targeted policy interventions. Emphasis will be placed on promoting clean energy adoption, strengthening public health programs, and developing climate-resilient strategies to mitigate environmental and health vulnerabilities. By integrating empirical evidence and analysis, this research aims to inform governance frameworks that strengthen climate resilience and mitigate air pollution's disproportionate impact. By identifying spatial and socio-economic disparities in pollution exposure and associated health burdens, the study provides a scientific basis for targeted interventions. It underscores the urgency of sustainable, multi-sectoral strategies such as transitioning to clean energy, enhancing air quality monitoring, and integrating health-based climate policies, to address the interconnected challenges of environmental degradation and public health in an era of accelerating climate change.



Do policies and programs related to housing and basic services help women in better adaptation to climate change? A Gender Audit Approach

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Abstract

It is well documented that women and children spend a greater part of their lives at home as compared to men. A recent Time Use Survey (TUS) by NSSO in 2019 has shown that women in India spend 8 times more time on household chores and care giving as compared to men. They are therefore much more impacted by inadequate housing and basic services of water, sanitation and clean fuel at home. It is estimated that more than 85% districts in India are prone to climatic extremes such as droughts, floods, cyclones and heat waves (IPE-Global & Esri-India, 2024) with frequency and intensity of extremes increasing four fold in the past few decades. As climatic changes and extremes impact women disproportionately, making them more vulnerable and at risk to climate change, it is important to examine how various programs and policies of the Government which provide for housing facilities as well as housing services help women in reducing their vulnerability by helping in enhanced climate adaptation. The present study has been done with the objective of examining the impact of schemes such as the *Pradhan Mantri Awas Yojana* (PMAY), *Pradhan Mantri Ujjwala Yojana* (PMUY), and *Nal se Jal/ Jal Jeevan Mission* (JJM) on the climate related adaptation of women using gender analysis approach. The study has been done by review of secondary literature of studies published in the last decade or more assessing the quantitative and qualitative impacts on women's adaptive capacity to climate change. Gender audit of the impacts was done using different Gender Analysis frameworks namely Harvard Analytical Framework, Gender Analysis Matrix and Moser Framework. This study employs a Gender Audit Approach to assess whether these housing and related schemes enhance women's ability to cope with climatic stresses and provide cushioning for better adaptive capacity. The study has shown substantial enhancement in adaptive capacity of women and families to climate change by virtue of better health through drudgery reduction, less time spent on household activities leading to more time for income generating and productive activities including children's education, greater financial security, decision making, power and greater autonomy. This study concludes that housing and related schemes significantly contribute to women's greater climate adaptation through greater assets ownership, enhanced economic security, better status in family and community thus leading to better gender equality and achievement of SDG 5. Keywords: Climate Adaptation, Women, Gender Audit, Policies and Programs, PMAY, JJM, PMUY



A Systematic Review: Role of Education in Empowering Women

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Abstract

Women empowerment means empowering women socially, economically and politically so that they can break away from male domination and claim equality with them. Its goal is to empower women by enhancing their independence and inner strength to make decisions in life, which encompasses both ideological and resource control. In addition to increased external control, women's empowerment entails developing inner capabilities such as increased self-confidence and a shift in one's consciousness that allows one to get past outside obstacles to resources and alter conventional wisdom regarding women's social, economic, and political advancement. Thus, it is evident that empowerment is concerned with power, namely with power dynamics and the allocation of power between individuals and groups.

A multifaceted process, empowerment aims to help people or a group of individuals fulfill their full potential and identity in all areas of life. Notwithstanding the advancements made by Indian women, the average Indian woman's life—from conception to infancy, childhood, adolescence, marriage, and motherhood—is a protracted struggle against discrimination and deprivation brought on by the sociocultural framework of the society that determines a woman's overall development. Therefore, achieving gender equality in all domains requires women's economic empowerment. Finding the main connections between education and women's empowerment is the aim of this essay. Knowing the fact that education provides the critical foundation from which further empowerment flows, the main objectives of this study is to review the role of education in empowering women.

Keywords: Women Empowerment, Gender Equality, Education, Socio-cultural Structure



The Study of Thrift Fashion: Opportunities and Challenges in Promoting Responsible Consumption and Production for Sustainable Development.

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Abstract

The fashion sector presents both a huge opportunity and a critical challenge in the effort to achieve the Sustainable Development Goals (SDGs) of the UN, especially when it comes to responsible production and consumption. The necessity for sustainable practices in sectors that promote economic growth, like fashion, which is well-known for its negative effects on the environment and society, is emphasized by the Sustainable Development Goal of responsible consumption (SDG 12). Thrift fashion, a growing and trending movement that promotes the reuse and recycling of clothing, is increasingly seen as an alternative model to “fast fashion”. Despite its rising popularity, there remains a noticeable gap in awareness, particularly among youth, regarding the environmental benefits of embracing thrift fashion. This gap is crucial as it highlights a lack of comprehensive research on how thrift fashion can be systematically integrated into broader sustainability efforts.

The aim of this study is to explore the opportunities and challenges of promoting thrift fashion as a key component of responsible consumption and production in line with SDG 12. This research employs a mixed-method approach, combining qualitative interviews and quantitative surveys of young consumers to assess their attitudes towards thrift fashion and the barriers preventing its widespread adoption.

The results indicate that thrift fashion is not only an environmentally beneficial practice but also increasingly seen as a desirable trend among younger consumers who are motivated by both sustainability and the desire for unique, cost-effective fashion choices. Theoretical contributions of this study lie in its examination of the intersection between sustainable fashion, social behaviour, and environmental impact.

Keywords: Thrift fashion, responsible consumption, SDG 12, sustainable development, fast fashion.



Private FM Radio and Sustainable Development Goals: A Content Analysis of radio content

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Abstract

Private FM radio channels in Delhi play a vital role in promoting the United Nations' Sustainable Development Goals (SDGs) through infotainment, awareness campaigns, and interactive programming. This study employs qualitative content analysis to examine how FM radio integrates SDG-related themes, with a focus on five major private FM stations: Radio Mirchi, Radio City, Red FM, Fever FM, and Big FM. The research identifies and evaluates SDG-oriented messages aired between January 2022 and December 2024, analyzing their relevance, thematic focus, and audience engagement strategies.

The study follows a structured content analysis approach, categorizing radio programs based on their alignment with SDGs such as gender equality (SDG 5), good health and well-being (SDG 3), quality education (SDG 4), climate action (SDG 13), and reduced inequalities (SDG 10). Data was sourced from radio broadcasts and official social media pages, with a total of 20 relevant programs selected for detailed analysis. Findings reveal that private FM channels act as powerful tools for behavior change communication, fostering public awareness and mobilization through localized narratives and participatory formats. This research highlights the evolving role of FM radio in advancing sustainable development and underscores the need for continued integration of SDG themes in media programming.

Keywords: FM radio, Sustainable Development Goals, content analysis, media for development, social impact, behavior change communication

Study has been sponsored by Indian Council of Social Science Research, Ministry of Education



AI In Agriculture: Sowing Seeds Of Innovation For A Smarter Future

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Abstract

Agriculture remains central to food security and socio-economic stability across the globe, yet it faces unprecedented challenges such as climate change, resource depletion, and a growing population. In response, Artificial Intelligence (AI) has emerged as a transformative force, revolutionizing traditional farming through data-driven technologies. This paper explores the integration of AI in agriculture and its capacity to enhance productivity, sustainability, and decision-making. AI-driven tools such as machine learning algorithms, sensors, drones, and computer vision are now used for precision farming, enabling real-time monitoring of crop health, optimizing irrigation, predicting pest outbreaks, and improving yield quality. Furthermore, AI plays a crucial role in livestock management, climate adaptation, supply chain forecasting, and genomic crop improvement. Case studies from India and beyond demonstrate successful applications, from AI-powered sowing apps to disease detection platforms like Plantix. However, this technological leap is not without challenges. Concerns surrounding data privacy, affordability for smallholder farmers, and environmental implications of AI infrastructure are significant. The paper also highlights the role of agricultural extension agents in promoting AI literacy and adoption. As AI technologies continue to evolve, their integration with IoT, blockchain, and genomics promises a future of climate-resilient and resource-efficient farming. Thus, AI in agriculture is not merely an innovation—it's a necessity for meeting the UN Sustainable Development Goals (SDGs) and ensuring long-term agricultural sustainability and equity.

Keywords: Artificial Intelligence, Precision Farming, Smart Agriculture, Sustainability, Technological Innovation



Evaluating the Efficacy of the ‘Sameer’ App in Promoting Air Pollution Awareness and Engagement among Teachers in Delhi

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Abstract

Air pollution is a critical environmental and health issue in India, yet public awareness and engagement remain limited. Traditional approaches to disseminating air quality information often follow the "knowledge deficit model," assuming lack of awareness as the primary issue. However, engagement with information is key to fostering pro-environmental behaviors. Mobile applications have emerged as powerful tools for air pollution communication, offering personalized, real-time information.

The present study examined the efficacy of the “Sameer” application in raising air pollution awareness among school and college teachers in Delhi. Using a pre-test and post-test experimental group design, 100 teachers (equal male-female ratio) were selected via snowball sampling. The experimental group used the app for a month, while the control group did not. Data collection tools included a knowledge inventory, a questionnaire on teachers’ health and mobile usage patterns, and MARS (Mobile Application Rating Scale) for user perceptions. Findings revealed high smartphone penetration, with most teachers using mobile devices primarily for work-related activities. Many teachers and their families suffered from chronic health issues aggravated by air pollution but rarely sought air quality information through digital platforms. Statistical analysis showed a significant increase in post-test knowledge scores for the experimental group, confirming the app’s effectiveness. User perception analysis found that while “Sameer” excelled in providing informative, functional, and aesthetically appealing content, it lacked engagement features. Behavior change theories suggest that public engagement is crucial for driving sustainable actions. Enhancing the app’s interactive components could foster deeper user involvement.

The study concludes that mobile applications like “Sameer” hold immense potential for raising air pollution awareness among educators. However, improving engagement features is essential to maximize its impact and drive meaningful behavior change.

Keywords: Air pollution, Public engagement, Mobile applications, Behavior change, Sameer app



Millets and Multigrains: An Environmentally sustainable Approach to Health, Nutrition, and Food Security

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In recent years, the Government of India (GOI) has introduced various initiatives to encourage the cultivation and consumption of millets. Despite their well-known nutritional and health advantages, millets and multigrain have yet to become a regular part of traditional daily diets. Foods made from millets and multigrains present an environmentally sustainable and climate-resilient approach to addressing the growing concerns of health, nutrition, and food security. As resilient crops, millets such as kodo, proso, foxtail, little, pearl, barnyard, and finger millet require minimal water, withstand extreme climatic conditions, and thrive in resource-poor environments. These characteristics position them as a sustainable alternative to conventional staples, which often demand intensive water use and contribute to environmental strain. This study reviews and explores the nutritional significance and role of millets and multigrains in enhancing food security by using secondary data from scientific literature and government reports. The study also presents a nutritious Indian snack developed using a blend of millet and multigrain flours. A traditional Indian sweet snack Shakkarpara was developed by a blend of Amaranth, Foxtail Millets, Sorghum, Finger Millet, and wheat. This value-added sweet snack was formulated and assessed for its nutritional profile, followed by sensory evaluation to determine its overall acceptability. This Sweet dish served as a nutrient-dense, climate-resilient snack that can be widely adopted for both rural and urban populations. The formulation supports broader objectives of improving public nutrition and promoting sustainable dietary choices.

Keywords: Millets, Multigrain, Environmentally sustainable, Healthy and Nutritious.



Redefining Gender Vulnerability: Towards Inclusive Legal Protection in International Law

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Abstract

The rising frequency of climate change-related disasters has drawn attention to specific vulnerable groups. For instance, the Intergovernmental Panel on Climate Change (IPCC) identifies, among others, women, children, and the elderly as particularly vulnerable to the adverse effects of climate change. While increasing protection, which includes legal safeguards, to vulnerable groups like women is essential, recent disasters indicate that gender vulnerability is not necessarily confined to women. For instance, in the case of Australian bushfires, men experienced higher casualties than women, mainly due to gender-based roles of being first responders and protectors. This highlights the significance of investigating the importance of integrating enhanced gendered vulnerability with environmental disaster response. This paper employs gendered perspectives to examine the necessity of broadening the understanding of gender vulnerability in legal frameworks. Towards that end, the first part of the paper engages with key perspectives relating to gender-based vulnerabilities, providing a framework for a comprehensive understanding of vulnerability due to climate change. Subsequently, the paper analyzes these perspectives within the context of recent disasters affecting diverse groups of individuals on the basis of gendered stereotypes.

Towards the end, the paper focuses on the evolving framework of International Disaster Law (IDL), arguing that while efforts to strengthen legal protection for traditionally vulnerable communities like women should continue, a holistic outcome should additionally focus on an increased recognition of emerging trends in gender-based vulnerabilities affecting men and other marginalized groups like transgender individuals.

Keywords: Climate Change, Gender-based Vulnerability, International Disaster Law, Gender Theories, Environmental Disasters.



The Gendered Burden of Malnutrition: Addressing Undernutrition and Obesity Among Women and Children

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Abstract

The Double Burden of Malnutrition (DBM) is the coexistence of both undernutrition and overnutrition in the same population across the life course. “Across the life course” refers to the phenomenon that undernutrition early in life contributes to an increased propensity for overnutrition among women and children. Later in the life course, diet and nutrition, and especially obesity, are important underlying causes of many non-communicable diseases (NCDs), including hypertension, diabetes, cancer, stroke, and ischemic heart disease. The causes of the DBM are related to a series of changes occurring in the world called the nutrition transition, the demographic transition, and the epidemiological transition of countries. This dual burden can manifest at the individual, household, or population levels. At the individual level it occurs with the emergence of two or more forms of malnutrition observed simultaneously—undernutrition represented by wasting, stunting, or micronutrient deficiencies co-occurring with overnutrition, overweight/obesity or subsequent overweight in an undernourished child. Socio-economic status heavily influences the extent of the dual burden, with obesity increasingly affecting the already undernourished poor. At present, the double burden of malnutrition (DBM) in child undernutrition of overweight/obesity of mothers within households is an emerging issue, specifically in low and middle income countries, including India. This new form of the adverse nutritional condition is considered the significant barriers for achieving Sustainable Development Goals (SDGs) 2 and 3 within 2030. Data was collected by digital form of questionnaire, aim of descriptive research study, we will examine the dual burden of malnutrition among women and children, explore the gendered dimensions of malnutrition to provide evidence-based recommendations for policymakers and stakeholders contributing to the achievement of Sustainable Development Goals (SDGs) 2 (Zero Hunger), 3 (Good Health and Well-being), and 5 (Gender Equality). Malnutrition disproportionately affects women and children due to socio-economic and gender disparities. The dual burden of undernutrition and obesity is rising, driven by food insecurity and unhealthy dietary shifts. Women’s empowerment and education improve nutrition outcomes, yet gender-sensitive interventions remain underutilized. Strengthening policies, community programs, and sustainable food systems is key to achieving SDGs 2, 3, and 5.

Keywords - Malnutrition, Gender and Nutrition, Women’s Health, Child Nutrition, Public Health Nutrition



Consumers' Food Safety Concerns at Higher Education Institutes

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Abstract

Background: The increasing pattern of dining out makes college canteen as one of the most important components that affect the quality of life at Higher Education Institutes (HEIs). While students and staff enjoy the food served in canteen at an affordable price, it also raises a lot of concerns about food safety. Consequently, the quality of university canteens and consumer satisfaction with these facilities profoundly impacts the stability of the institute. Unlike health inspectors, consumers can only rely on the visible cues, particularly those associated with food hygiene to judge the level of food safety in the canteen.

Objectives: Broad objective of the study was to explore the food safety concerns of consumers at HEIs and specific objectives were to analyse the food safety cues used by consumers in evaluating the food safety risk and to assess consumer satisfaction with canteen.

Methods: A cross-sectional study was conducted from May,24- December,24 using a questionnaire. The sample consisted of 271 respondents including students and staff employed in various colleges (35) of University of Delhi.

Results: The study identified that a high percentage of consumers (72.73%) were not satisfied with the food quality, service and cleanliness of the canteen. 76.3% consumers wish to visit the preparation area to witness the food safety principles followed by the food handlers. Consumers evaluate the food safety by the taste and appearance of food, illness after consuming food, FSSAI registration certificate displayed in the canteen and the personal hygiene maintained by the food handlers. Nowadays, consumers are even ready to pay little extra in order to ensure food safety in the canteen.

Conclusion: The study concludes that consumers these days are concerned about their health and therefore pay a lot of attention to food safety and hygiene. Hence, canteen owners can take customer feedback and incorporate changes accordingly, in order to improve the sanitary conditions of the canteen and satisfy their customers.

Keywords: food safety, personal hygiene, food handlers, canteen



Biofortified Pearl Millet: A Climate-Resilient Crop for Addressing Micronutrient Deficiencies in Vulnerable Populations

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Climate change, altered rainfall patterns, and the world's rising food demand have put a great deal of strain on the natural balance required for agriculture. With rising global temperatures and increasingly unpredictable rainfall patterns, millets provide a practical way to balance the demands of water availability and food security. Pearl millet (*Pennisetum glaucum*) is a nutrident crop that holds significant promise for addressing global health and nutritional security challenges. Pearl millet has unique attributes, such as resilience to adverse environmental conditions (heat, drought and various other abiotic and biotic stresses) and suitability for cultivation in resource-limited areas. In recent years, efforts have been made to fortify pearl millet with micronutrients through transgenic, agronomic and conventional breeding techniques, enhancing its nutritional content to combat malnutrition and improve the overall health of vulnerable populations. Micronutrient deficiencies are prevalent in many regions of India and biofortification can play a critical role in addressing these challenges. The strategies employed for enhancing pearl millet's nutritional content are extensively discussed in this paper, encompassing the enrichment of essential micronutrients such as iron, zinc, and provitamin A carotenoids. The paper describes the role of biofortified pearl millet in addressing food, nutrition and health security at the same time. By harnessing the inherent resilience of pearl millet and strategically enhancing its nutritional content, we have the opportunity to make significant strides toward achieving global nutritional security while fostering environmental sustainability and socio-economic development worldwide.

Keywords: Biofortified Pearl Millet, Biofortification, Climate Resilient, Micronutrient Deficiency, Nutritional Security



Artificial Intelligence (AI) enabled Chatbots: A Sustainable Approach of Waste Management for Smart and Circular Cities

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Abstract:

The concepts of sustainable development, smart waste management, and circular economy principles play a crucial role in the growing global focus on smart city initiatives and research. This study is based on the premise that artificial intelligence (AI)-driven IT applications are becoming increasingly significant in addressing waste management challenges within smart cities.

In this paper, we examine the role of chatbot applications specifically designed for waste recycling in urban environments and present innovative strategies to enhance their effectiveness. By reviewing and analysing various chatbot-based solutions aimed at facilitating recycling activities, we conduct a systematic evaluation of chatbot applications in the material recycling sector. A comparative performance analysis, structured in a tabular format, is provided based on key relevant criteria.

Our in-depth assessment of these chatbots has led us to propose enhancements aimed at optimizing their functionality. Accordingly, we introduce a set of forward-thinking concepts that could be integrated into future chatbot solutions to better support circular economy initiatives.

Looking ahead, future research will focus on developing an advanced chatbot solution to further improve waste recycling practices in smart cities. Such advancements could significantly contribute to sustainability initiatives and promote responsible environmental management within urban landscapes.

Keywords: AI Applications, Chatbots, Sustainability, Waste Management, Smart Cities, Circular Economy



Technical Session 2: Gender, gender equality & SDG's



Analysis of impact of selected Economic empowerment schemes on women's climate change related adaptation: A Gender audit approach

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Climate change is a major challenge for developing countries as India because of large scale climatic variability and extremes. Since the impacts of climate change are not gender neutral, incidences of hazardous climatic events make women more vulnerable than men due to lack of financial resources, lower participation in work force and consequent economic disempowerment. The gender based roles lead to women's greater participation in unpaid household work and care giving, leading to further barriers in economic participation. If the adaptive capacity of women to face climatic challenges has to be improved, they need to be economically empowered to enhance the family spending on food and nutrition security, health, education and preventing the families to fall below poverty line. In addition, the savings can work like a cushion in times of climatic extremes which often lead to failure of livelihoods including agriculture. The present study has been done with the objective of assessing the impact of selected economic empowerment schemes of the Government namely PM Jan Dhan Yojna (PMJDY) and PM Mudra Yojna (PMMY) on the climate related adaptation of women. The study has been done by reviewing secondary literature published between 2018 to 2024 on the impacts and outcomes of these programs. The impacts were aggregated and subject to gender audit using a combination of suitable Gender Analysis Frameworks such as the Harvard Analytical framework, Caroline Moser's framework and Gender Analysis Matrix. The analysis has shown positive impact of the two programs on the Strategic Gender needs of the women such as autonomy, confidence, decision making with respect to spending as well as money availability to meet the household and other expenses. Their community role increased as more women came into the public domain and operated their bank accounts for managing finances. Women's role in productive activities enhanced as some women used the loans to start their entrepreneurial activity such as poultry keeping. Some women allocated their savings towards education of their children, purchase of medicines and purchase of household assets which reduced their drudgery. The two programs had the potential to reduce the risks posed by climatic extremes and hazards through enhanced adaptive capacity.

Keywords: Women, climatic change, vulnerability, adaptation, Government programs, gender audit, PMJDY, PMMY



Media, ICTs and Indian Knowledge Systems for Viksit Bharat

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Abstract:

ICT has revolutionized the way information is processed, shared, and accessed. Students, educators, and faculty members can now effort lessly reach educational resources from anywhere anytime without any barrier in the world through the internet. Digital libraries, research databases, and academic websites provide learners to every institutes and remote access available with current and relevant materials for their studies. This wealth of information is instantly available and easily accessible, empowering students to learn at their own convenience and pace. A "Viksit Bharat" in 2047 can be realized by blending India's ancient knowledge systems with modern scientific advancements, creating a balanced approach to growth. By reviving the Indian Knowledge System, India can emerge as a global leader in areas like sustainable development, ethical governance, and innovative technology, while also retaining its cultural and spiritual roots. This will not only benefit India but also contribute to the global discourse on future development models. Through a thorough review of existing literature and case studies, this paper explores many kind of updating and relate current scenario. It investigates how digital storytelling, online education, and open-source platforms can be utilized to bring IKS to the forefront of modern-day solutions for challenges like sustainability, healthcare, and social equity. Furthermore, the paper delves into the role of media in promoting IKS in policy-making, education, and public consciousness, thus empowering citizens to engage in responsible, knowledge-driven development. the paper also presents recommendations for government and non-governmental stakeholders to integrate IKS into national education frameworks, policy-making, and technology platforms. This integration will not only contribute to India's emergence as a "Viksit Bharat" by 2047 but also position India as a global leader in combining ancient wisdom with modern technological solutions.

Keywords: Media, ICTs, Indian Knowledge Systems, Viksit Bharat, Sustainable Development, Indigenous Knowledge, Education, Policy-Making, Technological Innovation.



Unlocking the Impact of SDG 3 and Sustainability

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Abstract

The sustainable development goals have acted as a blueprint for the world to have a sustainable future. SDG 3 aims towards ensuring healthy lives and promoting wellbeing of all ages. Maternal mortality plays an inevitable role under this goal and has been one of the major concerns of high mortality rates among women. As per UNICEF “every 20 minutes a mother is dying due to pregnancy or childbirth related causes largely” (UNICEF, 2018). For India, this has been a major threat to the health governance model of the state. Since, 2015 it has been struggling to achieve the maternal mortality rate as envisaged by the Millennium Development Goals. The assessment of progress towards the MDGS in India has repeatedly highlighted that the weaker sections mostly those who are disadvantaged due to age, disability, ethnicity or gender are usually bypassed. Hence, the paper tries to assess the key interlinkage of the maternal health variable to the larger goal of development and a sustainable growth in view of 2030 SDGs. The role of the government and other stakeholders play a crucial role in achieving this milestone through an effective model of collaborative governance. The research tries to highlight the role of the government in tackling the discrepancies in the access, affordability and utilization of maternal health services.

Keywords - maternal health, sustainable goals, governance.



Bridging the Gender Digital Divide: The Impact of Digital Skill Training on the uptake of ICT for health services by Rural Women

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Information and communications technologies (ICTs) can play a significant role in improving health care by providing new and more efficient ways to access health information and services. However, the use of technology in accessing health care is creating a digital divide among population between those who can access, afford and capable to use these ICT4H programs and those who are lagging behind and are digitally illiterate. The gender digital divide is acting as one of the major barriers in harnessing the actual benefits of these ICT4H programs. Women continue to face disadvantages due to existing power dynamics in society. Hence, there is a need to create awareness among the women about the ICT for health programs, and upgrade their skills by training.

Therefore, the present study was conducted to assess the potential impact of a need-based training module on the uptake of ICT4H programs. The study was conducted in a rural area of District Kangra, Himachal Pradesh. A randomized controlled trial was used as the experimental research design. A total of 60 women were selected and randomly assigned to either the experimental or control group in a 1:1 ratio (30 participants each). The experimental group received training on using ICT components of health programs, while the control group did not receive any training. The results indicated that the digital skill training on using ICT4H programs had a statistically significant impact on the knowledge as well as functional skills of the women. The combined scores of knowledge based and functional skills had improved from ($M=8.1 + 2.4$) to ($M=24.7 + 2.8$) after the training, $p < .00001$. Additionally, 97% of the women reported improved awareness of various health schemes following the training. The study also highlighted the positive impact of training on women's overall awareness, skill development, and self-confidence. The study concluded that the training programs can be instrumental in making the women more confident and motivated to use ICT based programs which could consequently lead to better uptake of the ICT based services and programs.

Keywords: Women, Digital skills, ICT, Health, Training



Assessment of Safety Compliance On-Site for Safety of Construction Workers

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Abstract

Safety compliance in construction is the process of following safety regulations and guidelines to prevent hazardous injuries and accidents on-site. The data findings revealed that 50% **construction companies** had taken requisite **fall protection measures** such as installing fall arrest systems, slide guards, guardrails etc. All four construction companies were in compliance with safety regulations and allowed only trained workers were allowed to use power tools and nail guns after wearing appropriate PPE. For **electrical safety** Lockout/tagout (LOTO) system was communicated to all workers and frayed, damaged or worn electrical cords or cables were immediately removed by safety personnel. Required **safety equipment or PPE** such as hard hats, shoes, eye glasses, face shield and ear plugs or ear muffs were provided to all workers by all four companies as specified by Bureau of Indian Standard (BIS) standard IS 17423:2020 and ISO 9001: 2015. **Hazard communication** was done by placing safety signage at prominent locations on-site. safety signages were available on all the eight sites. Personal Protective Equipment (PPEs), ladder, electrical equipment and housekeeping **safety inspection** was done on weekly basis as these were critical areas and high stake were involved in terms of resources (material and human resources) and hence, required good supervision and continuous monitoring. SOP for **emergency** on-site Emergency Response Team (ERT) was set-up consisted of site controller and their rescue team, safety officers, supervisors, workers and incident controller. Site controller and their rescue team was responsible for barricading and evacuating the area in case of emergency by continuously blowing the siren from emergency control room for one minute. The findings indicated that overall safety compliance was found to be good only in two construction companies in terms of implementation of safety specifications and regulations, indicting possible gaps and inefficiencies in complete safety adherence by construction companies.



Design development using Indian knowledge systems: preserving and commercializing gond art for Viksit Bharat 2047

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Abstract

Gond art, a traditional tribal art form of central India, is deeply rooted in nature and storytelling. Characterized by intricate patterns composed of dots, lines, and shapes, it reflects the tribe's cultural beliefs, environmental harmony, and indigenous wisdom. However, modernization and shifting consumer preferences pose challenges to its continuity, necessitating innovative approaches to preservation and commercialization. This research explores the integration of the Indian Knowledge System (IKS) into design development to adapt Gond art for contemporary applications while maintaining its authenticity, aligning with India's vision of Viksit Bharat 2047.

This study explores the historical and artistic significance of Gond motifs through a structured design process, resulting in contemporary yet culturally rooted designs. Key motifs includes, the Bull Horn, symbolizing strength and tribal identity, reimagined with intricate Gond patterns for embroidery or digital printing; the Half Face, inspired by gender balance and Baiga tribe tattoos, designed as jewelry embellishments; the Tree of Life, representing motherhood and nature through running stitch embroidery; and the Horse Hybrid, reflecting harmony between humans, animals, and nature in vibrant Gond colors.

These motifs are incorporated into an apparel collection that considers motif placement, color palettes, fabric selection, and finishing techniques to ensure commercial viability while preserving cultural essence. The study underscores sustainability, economic empowerment, and social inclusion by promoting craft-based livelihoods for tribal artisans, particularly women. By blending traditional craftsmanship with modern design strategies, this research presents a sustainable model for cultural preservation, fostering economic self-reliance and ensuring the thriving legacy of Gond art in a modernizing India for Viksit Bharat 2047.

Keywords: Gond Art, Indian Knowledge System (IKS), Design Development, Cultural Preservation, Sustainable Commercialization.



Gender equality and empowerment of refugee women

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Empowerment can be described as a process through which men and women in disadvantaged or vulnerable situations increase their access to resources, knowledge, decision making power and increase their participation in their community life. Displacement is a disempowering and harrowing experience for both men and women but women are at double disadvantage because of their gender and refugee status. Shrinking of civil space and harmful gender norms restrict forcibly displaced girls and women meaningful participation and access to educational, economic and leadership opportunities in several countries.

According to UNHCR, girls and women make up 51% of the forcibly displaced persons. Due to their vulnerability, they are more prone to attacks and rape. Faced with these constraints, they are unable to become part of the decision-making structures and their voices are unheard on issues that affect their wellbeing and those of their children. Women refugees need intersectional and right based approach. The effort should be made to promote gender equality and empowering girls and women.

Yet, migrant and refugee women's needs, voices and priorities are usually missing from policies framework. While displacement creates problems and challenges for women refugees, it also creates opportunities for them. Everyday women refugees overcome conventional roles that discourage their participation in political and economic life, challenging customs and norms borne out of necessity in order to provide support to themselves and their family members. Many refugee women are receiving cash assistance for helping in their resettlement and also credit facilities to reconstitute their livelihood activities.

The present paper tries to conceptually understand women empowerment in the context of refugee situation. The paper aims to fill a literature gap with regards to gendered lens approach and effects on well-being and empowerment of women refugees. This paper is based on secondary source information and uses a descriptive research design. Systematic literature review has been done for the study.

Keywords: Refugee women, Employability, Entrepreneurship, livelihood, discrimination, patriarchy



Do training programmes in Digital Literacy meet the gender specific needs of NEET girls and women?

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Abstract

India has a substantial number of young women (51.7%) aged 15 to 24 years who are not in employment, education or training (NEET) as more than 90% of them are forced to take up unpaid household work as compared to only 7.3% men due to gender based distribution of household work. As countries make efforts to meet the SDGs pertaining to women emancipation and empowerment, digital inclusion and economic empowerment of women is extremely important. In future, almost 90 percent of the jobs in different fields including the unorganised sector and care economy will require digital skills. As per estimates, digital exclusion of women in low and medium income countries in the last decade may have led to losses of 1-1.5 trillion US dollars (UN Women, 2022).

Considering the importance of digital skills, the Government of India has started several digital literacy programs for the digitally excluded sections of population including men and women. However, it is important to ascertain how far do the training programs satisfy the gender specific needs of women, in terms of income generation capability, control over resources, decision making and enable them to be more empowered individuals. The present study has been conducted to analyse the existing digital training programs using the gender lens with the help of suitable Gender Analysis Frameworks (GAF). About 15 existing training programs were evaluated and analysed. The training syllabi were subject to selected gender analysis parameters. Research studies which documented the impact of training on women were also considered. This study has shown that the existing training programs do not adequately address the gender-based needs of women including their Practical and Strategic Gender Needs. If the digital literacy programs have to be more gender positive and transformative, they need to be planned considering the specific needs of women as well as the NEET girls.

Keywords: Digital literacy, training, Gender, Gender Analysis Frameworks



Youth Profiling for Viksit Bharat: Insights from a Pilot Study

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Youth play a critical role in shaping the future of any nation, as they represent the energy, innovation, and potential needed for holistic development. With their adaptability and creativity, young people drive social, economic, and technological advancements. United Nations identifies that there are 1.8 billion people between the ages of 10-24, representing the largest generation of youth in history. India also has a substantial youth population; therefore, it is imperative to harness their capabilities to achieve sustainable development and transform India into a "Viksit Bharat,".

However, youth in India face numerous challenges, like high unemployment rates, limited access to quality skill development, and a mismatch between job opportunities and their aspirations. They face barriers such as financial instability, societal pressure, and inadequate support for entrepreneurship, which hinder their ability to achieve personal and professional growth. Ministry of Labour and Employment (2024) in a recent study reports the youth unemployment rate of 10.2% which reflects a great risk to the skill development of the youth.

Therefore, this research attempts to profile the youth and explore their career choices, employment crisis, and awareness of government policies. The study also suggests the need for youth empowerment through skill development and entrepreneurship to align with the broader goals of sustainable development, gender equality (*SDG 5*) and reduced inequalities (*SDG 10*). It also emphasizes the need for youth-centric government schemes and effective policy implementation to ensure the active participation of youth in India's socio economic growth.

Keywords: Youth, Viksit Bharat, Policy Awareness, Sustainable Development



Social stigma and child abuse in Uttarakhand: A multi-stakeholder approach for behavior change and social policy

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Abstract

Social stigma remains a formidable barrier to addressing child sexual abuse (CSA) in India, particularly in collectivist societies where family honor, societal norms, and gender roles often silence survivors. In Uttarakhand, CSA victims frequently face victim-blaming, parental rejection, and limited institutional support, exacerbating their trauma and preventing access to justice and rehabilitation. This study examines the role of social policy and Social and Behavior Change Communication (SBCC) in dismantling stigma, promoting awareness, and fostering a supportive, survivor-centric framework within child protection services. Using a qualitative research design, in-depth interviews were conducted with 18 key stakeholders, including Child Welfare Committee members, ChildLine coordinators, and officials from the Ministry of Women Empowerment and Child Development, Uttarakhand. Thematic analysis reveals how deep-rooted socio-cultural norms contribute to the underreporting of CSA, with survivors and their families often facing social ostracization. The study highlights systemic gaps in child protection services and ineffective communication strategies hinder timely intervention and support. By linking child protection efforts to broader SDGs, including gender equality (SDG 5), health and well-being (SDG 3), and reduced inequalities (SDG 10), this research underscores the need for policy-driven SBCC interventions. It calls for multi-sectoral collaboration, community engagement, and culturally sensitive public awareness campaigns to shift perceptions, improve institutional response, and create a safer environment for CSA survivors. In alignment with *Viksit Bharat 2047*, the findings emphasize the urgency of integrating SBCC strategies within social policy frameworks to ensure the long-term empowerment and well-being of survivors, ultimately contributing to India's equitable development.

Keywords: Social stigma, child sexual abuse, family honor, Uttarakhand, SDGs



Gender Equality and Occupational Health: Opportunities and Challenges in Achieving SDGs—A Case of Women Workers in the Lock Industry

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Abstract:

Gender equality in the workforce is a crucial component of the Sustainable Development Goals (SDGs), particularly in ensuring decent work, economic growth (SDG 8), and good health and well-being (SDG 3). This study explores the occupational health challenges faced by women employed in the lock industry in Aligarh, India, highlighting the intersection of gender disparities and labor conditions. Using a descriptive approach, data were collected through semi-structured interviews and secondary sources to analyze the socio-economic conditions, workplace hazards, and health management strategies of women workers. These women, primarily from lower socio-economic backgrounds, work 6-9 hours a day without rest breaks, safety measures, or essential workplace facilities. Their employment provides financial security but comes at the cost of severe health implications, including joint and muscular weakness, leg swelling, and chronic stiffness, impacting their overall well-being and productivity. With no access to employer-provided healthcare or government assistance, they rely on unregulated, low-cost medical care, often allocating a significant portion of their earnings to manage their health issues. This study underscores the urgent need for gender-responsive policies and workplace reforms to promote occupational health, economic empowerment, and gender equality, aligning with global SDG commitments.



Fear, Procrastination, and Progress: Turning Challenges into SDG Opportunities

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Abstract

Fear of failure (FoF) and procrastination are inter-related challenges faced by young adults of present era that greatly determine the level of their performance in academics, careers, and well-being. The study investigates the relationship between FoF and procrastination and enhances the view of its role as both a challenge and opportunity toward achieving the UN Sustainable Development Goals (SDGs). This study uses the Performance Failure Appraisal Inventory (PFAI) and Tuckman procrastination scale to explore fear and procrastination tendencies in young adults aged 18-30. Using descriptive research design the study explores FoF from social perception, self-esteem, and competence, all contributing towards avoidance behaviors such as procrastination.

Such behaviors obstruct the realization of SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). These behaviors also provide a window of opportunity to boost youth productivity and engagement through targeted intervention.

The study, therefore, provides a platform for formulating actionable strategies for addressing procrastination due to FoF. Thus, young people may get empowered in pursuing goals confidently and of working toward boosting personal growth and making action toward sustainable development by enabling them to share in societal progress.

Keywords: Fear of Failure (FoF); Procrastination; Young Adults; Sustainable Development, Goals (SDGs); Growth Mindset.



Sustainable fashion intention and practice forecasting: A behavioral approach

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Abstract

The fashion industry is shifting towards more sustainable practices, making it important to understand what drives consumers to choose eco-friendly fashion. As people become more aware of environmental issues, their shopping habits are also changing. This study explores the key factors that influence sustainable fashion choices, such as environmental awareness, social expectations, personal values, and the level of control consumers feel over their decisions. By analyzing a sample of 200 participants, this research looks at how these factors shape consumer intentions and behaviors. While many consumers support sustainability, there is often a gap between their beliefs and actual purchasing decisions. Social norms, personal awareness, and accessibility to sustainable options all play a role in shaping these choices. Businesses can help bridge this gap by educating consumers, making eco-friendly products more accessible, and promoting responsible fashion choices. Encouraging people to make informed decisions can drive meaningful change across the industry. This study provides insights that can help designers, retailers, and policymakers create strategies to support sustainability in fashion. Collaboration among consumers, brands, and policymakers is essential to build a more ethical and eco-friendly fashion industry. By reducing waste, improving efficiency, and promoting responsible production, the industry can move toward a greener future. In the end, sustainability in fashion is not just about individual choices—it's a collective effort that requires awareness, action, and innovation.

Keywords- Sustainable Fashion, Consumer Behavior, Behavioral Determinants, Personal Values, Social Norms



Social Media Influencing Young Women's Decision Making and Aspirations: FoMO's take on Women Empowerment

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Abstract

Social media platforms are linked to increased Fear of Missing Out (FoMO) due to the emphasis on sharing personal experiences. FoMO, refers to the anxious feeling that you may be missing exciting events that others are attending, especially as a result of what you see on social media. Approximately 75% of young adults struggle with FoMO (Roberts, 2019). Research shows FoMO leads to excessive social media use, including constant updates checking, obsessively scrolling, and anxiously accessing social media. This behavior can cause negative effects like reduced productivity, poor sleep, and difficulty maintaining relationships. FoMO also complicates decision-making, making people unsure, unhappy, and regret with their decisions afterward (Diana Jaworska, 2024).

The impact of FoMO on decision-making is profound. Many young women, driven by the desire to be noticed, famous, and wealthy in the shortest time possible, often prioritize immediate social validation over long-term personal growth. Instead of focusing on building knowledge and skills that foster genuine empowerment, they are lured by the allure of quick success as portrayed by social media influencers. This comprehensive review highlights the growing issue of social media addiction and the Fear of Missing Out (FoMO), focusing on how these factors impact the decision-making processes of young women. A thorough review of the literature recommends immediate interventions at the familial and societal levels to address these mindsets for turning them into empowered young women and corner stones for viksit Bharath 2047.

Keywords: Fear of Missing Out (FoMO); Social-Media; Decision Making; Women empowerment.



A review -policies and politics along the plastic life cycle

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Abstract

Despite the fact that plastics have a lot of benefits, it is being recognized as one of the major sources of environmental problems across the globe. There have been a lot of efforts from the various government bodies, researchers, policymakers, citizens, and other stakeholders to reduce plastics pollution but still all of it is failing to stem the tide of the growing plastic production, its use, and its disposal. The present waste management system in India is largely ineffective, with a significant proportion of mismanaged plastic waste due to its untraced littering. This paper attempts to sketch the prominent governmental reforms in the area of plastic waste management. The review describes the development of various policy initiatives in India which targets plastic pollution, followed by a review of the key legislations at each step of the plastics life cycle from production, through consumption, to waste and pollution and finally provides current policy recommendations.

Keywords- Plastic waste, rules, legislation, governmental initiatives, management



Assessment of mechanical injuries experienced by the respondents engaged in holding decorative umbrella light during baraats

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Abstract

This study aims to systematically assess the mechanical injuries and occupational hazards encountered by respondents engaged in holding decorative umbrella lights during baraats. These illuminated umbrella-shaped structures, whether handheld or pole-mounted, significantly enhance the aesthetic appeal of the event but simultaneously impose considerable physical strain on the workers involved. Employing a descriptive research design, the study focuses on respondents residing in Vadodara District, aged 18 years and above, who are physically and mentally fit. The research investigates the prevalence, nature, and severity of mechanical injuries such as cuts, blisters, skin hardening, and redness, which result from prolonged gripping, repetitive strain, and exposure to harsh environmental conditions. Additionally, it examines work-related hazards, including excessive sweating, electric shocks, and visual discomfort caused by prolonged exposure to bright illumination. Standardized ergonomic assessment tools and structured questionnaires were utilized to obtain comprehensive data. The study further explores the influence of personal factors such as age and work experience on the prevalence and severity of injuries. Findings reveal a high incidence of musculoskeletal discomfort and mechanical injuries among respondents due to prolonged exposure to physically demanding tasks, inadequate ergonomic support, and insufficient rest intervals. To mitigate these occupational risks, the study proposes ergonomic interventions, including the use of padded gloves, grip modifications, scheduled rest intervals, and structured stretching exercises before and after the procession. Additionally, the implementation of height-adjustable poles and improved ergonomic support mechanisms is recommended to alleviate biomechanical strain. By identifying critical occupational risk factors and proposing evidence-based preventive strategies, this study contributes to the enhancement of occupational safety and worker well-being. The findings underscore the urgent need for ergonomic interventions to reduce physical strain, prevent long-term health implications, and improve workplace efficiency for respondents engaged in this demanding task.



Technical Session 3: One Health Approach & Well Being



Antimicrobial Resistance in *Klebsiella*: An Escalating Challenge and Possible Remedies

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Abstract

A critical challenge to global healthcare is an ever-increasing resistance to the available antimicrobial treatments in microorganisms. High population density, unwarranted use of antibiotics in patients and poultry and animal farming make India vulnerable to a major public health crisis. *Klebsiella pneumonia* is one among the ESKAPE pathogens recognized by WHO as the major multidrug-resistant microorganisms of concern in healthcare facilities. As Delhi metallo-1 beta lactamase was first detected in 2008 in a *Klebsiella pneumoniae* strain isolated from an Indian patient in Sweden, India has become a breeding ground for such resistant strains. Over the past decade, strains of “difficult-to-treat” *Klebsiella pneumoniae* have become the most common cause of nosocomial infections particularly in India. Alternate approaches to combat this problem involve the use of repurposed drugs, combination of antibiotics, phage therapy, antimicrobial peptides, and natural products. Repurposing drugs involves the incorporation of already approved drugs with altered composition, combinations or dosage. Another approach to combat AMR involves the use of two or more drugs in combination. Colistin, in combination with antibiotics like amikacin, gentamicin, and meropenem, has led to a significant decline in the population of heteroresistant *K.pneumoniae*. An alternative approach involves the use of lytic phages in therapies. Certain antimicrobial peptides tend to target cellular machinery of the pathogen, making it vulnerable to lysis. The use of naturally available products to impede the growth of antimicrobial-resistant strains have been extensively explored in recent years. Eugenol, a naturally occurring bioactive compound, has been found to be effective against Carbapenem-resistant *Klebsiella pneumoniae*. In conclusion, antimicrobial resistance is a grave concern and is estimated to cause millions of deaths by 2050. This review article overviews the present global statistics of growing AMR cases, challenges in their management and a comprehensive study of the currently explored alternative approaches to overcome AMR.

Keywords: Antimicrobial Resistance (AMR), Drug repurposing, Phage Therapy, Antimicrobial peptides, *Klebsiella pneumoniae*



Diversity of Hydrocarbon-Degrading Microorganisms: Ecological Significance, Mechanisms, and Applications

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Abstract

Hydrocarbon-degrading microorganisms play a crucial role in mitigating petroleum pollution in diverse ecosystems. This study deals with the diversity of hydrocarbon-degrading microorganisms in detail, including various bacterial, fungal, and archaeal taxa, as well as factors influencing their degradation efficiency, including temperature, nutrient availability, and oxygen levels, focusing on their ecological and biotechnological relevance in bioremediation. The insights from deep-sea sediments, microbial diversity and terrestrial environments call upon the importance of environmental variables in enhancing microbial efficacy. This knowledge shall be very important for maximizing bioremediation applications in restoring hydrocarbon-polluted environments. The research also explores the microbial diversity in deep-sea sediments, terrestrial ecosystems, and extreme environments about their adaptive mechanisms that may increase hydrocarbon-degradation abilities. Again, the findings explore emerging trends in bioremediation techniques (i.e., bioaugmentation or biostimulation) to maximize the microbial potential to accelerate remediation rates at hydrocarbon-polluted sites. Given the rising incidence of hydrocarbon pollution due to industrial processes and oil spills, utilization of the activities of hydrocarbon-degrading microbes is an affordable and environmentally friendly approach to alleviating ecological harm. Further, the study highlights the importance of integrating microbial ecology with the advancements in biotechnology to develop more effective and precise bioremediation protocols. The outcomes presented in this work confirm the continued research to improve the activity of microbes in hydrocarbon degradation, and consequently, facilitate the process of rehabilitating polluted ecosystems with the view to enhancing sustainable ecological conservation. This review emphasizes the significance of performing interdisciplinary research that integrates microbiology, environmental science, and biotechnology to create innovative microbial associations and optimize the pathways of degradation for boosting hydrocarbon bioremediation in diverse and critical environmental conditions.

Keywords: Hydrocarbon-degrading microorganisms, Bioremediation, Petroleum pollution, Ecological conservation, Microbial diversity.



A review of the critical environmental factors in the pathogenesis of psoriasis with special reference to nutrition

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Abstract

Psoriasis is a chronic, immune-mediated, auto-inflammatory, non-communicable skin disorder with environmental and genetic factors contributing to its pathogenesis. It affects around 1-2% of the world's population and has multiple subtypes: plaque, pustular, guttate, inverse, nail, scalp, and erythrodermic. Heritability factors indicate that 50% to 90% of the psoriatic phenotype has its relation to genetic factors, and the remaining variability is linked to environmental factors. Diet, obesity, smoking, alcohol consumption, physical inactivity, infection, drugs, and leading a stressful life are some of the key environmental factors related to psoriasis pathogenesis. It is characterised by sharply demarcated erythematous plaques with whitish scales, which may affect the body's visible areas. It is also associated with multiple comorbidities, namely psoriatic arthritis (PsA), cardiovascular diseases, hepatic diseases and psychological disorders. Beyond the physical irregularities, it also has an extensive emotional and psychological effect on the patients. Ancient Ayurvedic texts have mentioned the importance of diet in the causation and management of psoriasis. Ayurveda mentions that consuming an unhealthy diet rich in *Viruddha Ahara* (~incompatible foods), *Mithya Ahara* (~improper diet), and *Apathyas* (~foods to be avoided) may lead to psoriasis. An unbalanced diet rich in *Amla* (~sour foods), *Lavana* (~salt), *Katu Rasa* (~pungent, spicy), sugar, etc. are advised to be avoided as it is found to exacerbate psoriasis. Rather, a diet rich in *Pathyas* (~foods to be included), healthy fats, protein, old cereals and bitter vegetables are encouraged to be consumed to manage psoriasis. Thus, this paper emphasises the importance of proper dietary habits and following a healthy lifestyle for the management of psoriasis cost-effectively and easily.

Keywords: Psoriasis, Nutrition, Diet, Ayurveda, Environmental factors



Exploring Phycobilin Pigments as Sustainable Alternatives to Synthetic Textile Dyes

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Abstract

The textile industry is among the largest contributors to environmental pollution, with synthetic dyes posing severe risks to human health and ecosystems. Their widespread use has been linked to carcinogenic effects, aquatic toxicity, and bioaccumulation in the food chain, raising urgent concerns about sustainable alternatives. While natural dyes have gained renewed interest, conventional plant-based dyes face challenges such as shade reproducibility and variability in dye yield, limiting their large-scale commercial viability. Addressing these challenges, the present study investigates phycobilin pigments derived from blue-green algae (*Anabaena sp.* and *Spirulina sp.*) as potential eco-friendly textile colorants. The extracted pigment was applied to cotton, wool, and silk fabrics under optimized dyeing conditions, including temperature, pH, and common salt addition. The dyeing efficiency was evaluated through visual assessment under a D65 light source, colour strength (K/S values), and colour fastness tests for washing, rubbing, and sunlight exposure. The results revealed that the pigment imparted a soft blue-purple hue to the fabrics, with optimal dyeing achieved at 40°C, neutral pH, and without dye auxiliaries. Mordanting with tannic acid enhanced colour fixation, with cotton exhibiting the highest colour strength (K/S = 50.862), followed by wool (45.966) and silk (34.449). The dyed fabrics demonstrated good fastness to washing and rubbing (ratings: 3/4 to 4) and fair fastness to sunlight (ratings: 5). These findings underscore the potential of microalgal pigments as a renewable, non-toxic alternative to synthetic dyes, contributing to sustainable textile production and the achievement of SDG 12 (Responsible Consumption and Production) and SDG 14 (Life Below Water).

Keywords: Algal dye, Natural dyes, Phycobilin pigments, Sustainable textile dyeing



One Health Perspective on Antimicrobial Resistance in *Clostridium difficile*: The Promise of Phage Therapy

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Abstract

The rise in antimicrobial resistance (AMR) poses a significant global health threat by diminishing the effectiveness of antibiotics in combating bacterial infections. Many pathogens once susceptible to multiple drug classes have now become resistant to most of them. This makes it difficult to control the infections, which raises morbidity, mortality, and medical expenses. *Clostridium difficile*, a Gram-positive, spore-forming anaerobic bacterium, is a leading cause of antimicrobial-associated diarrhea in hospitalized elderly patients and a significant example of how AMR is intensifying challenges for healthcare systems. In the United States, *C. difficile* causes 30,000 fatalities and 500,000 infections annually. Despite the limited data on the financial impact of *Clostridium difficile* infection (CDI) in India, a study conducted in 2015-16 found that the average hospitalization cost for cirrhotic patients with CDI amounted to \$1,183.72. The recommended course of treatment for CDI consists of 10–14 days of oral metronidazole for mild cases and oral vancomycin or fidaxomicin for moderate to severe infections but this course of treatment might not be enough to result in recovery, also using antibiotics for prolonged periods of time could negatively impact the gut microbiota and hinders improvement. Phage therapy, which uses bacteriophage specificity to target *C. difficile* without interfering with the host's beneficial microbiota in contrast to broad spectrum antibiotics, is one of the potential strategies, which delays the development of resistance, hence offering a novel approach in the management of CDI. This paper mainly focuses on phage therapy that holds potential to mitigate the widespread issue of AMR and serve as an effective approach for treating recurrent CDI.

Keywords: *Clostridium difficile*, Phage Therapy, Antimicrobial Resistance, Vancomycin, Metronidazole



Synergistic Bioremediation of Plastics and Wastes by Delhi Landfill Microbiome: A Step Towards Sustainability

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Abstract

Every year, hundreds of millions of plastic materials are produced, a significant portion of which ends up as industrial and household waste in the environment. Due to their persistent nature, these plastics can remain in ecosystems for centuries or longer. Biodegradation presents a sustainable solution for removing these toxic materials from the environment while also enhancing soil fertility by improving nutrient bioavailability. Plastic-degrading microbes exist in diverse environments, including soil, seawater, and areas heavily polluted with plastic waste. Microbial consortia, which are groups of two or more microorganisms that interact synergistically, play a crucial role in natural and engineered ecosystems. Our research focuses on isolating and analyzing microbial consortia from landfill soil to evaluate their potential in degrading HDPE plastic, contributing to sustainable waste management. Specifically, we have studied microbial consortia from Bhalswa landfill, Delhi, aiming to identify plastic-degrading microbes. We employed a culture independent approach metagenomics to mine novel plastic degrading enzymes along with a culture-based approach. To achieve this, we collected landfill samples and cultured them in Bushnell Hass broth (BHB) supplemented with different plastic sources for enrichment of selected microbial strains. Twenty four independent colonies were collected and phylogenetic identification was done using 16srRNA sequencing. Majority of them belonged to the *Bacillus* species. In addition, whole metagenome analysis was carried out to get the phylogenetic information on important taxa and enzymes present in the plastisphere using Illumina Hiseq 4000. The sequencing of the samples was done after incubation in presence of HDPE plastic for 6 months in BHB under laboratory conditions along with control. Taxonomic classification revealed the relative abundance of bacteria (96%), followed by archaea (2%) and this was similar in both samples. The abundance profile of the potential plastic degrading enzymes is underway and will be compared using the plastics- active enzyme database (PAzy). Overall, this study expands the number and diversity of enzymes naturally able to hydrolyze HDPE plastic along with other contaminants present in these polluted landfills.

Keywords: Biodegradation, Bioremediation, Hydrolytic enzymes, Metagenomics, Sustainability



Vaginal Microbiome Under Threat : The Effect of Feminine Hygiene Products

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Abstract

The interplay between the microbiome and health is essential for vaginal homeostasis and well-being. The vaginal microbiome supports pH, reproductive health, prevents infections, and is self-sustaining. The vaginal microbiota is dominated by *Lactobacillus spp.* which maintains urogenital health. However, hygiene products impact *Lactobacilli* colonization. Women are waxing or bleaching these days for aesthetic purposes. Removal of the protective layer of *Lactobacilli* raises the risk of bacterial vaginosis, yeast infection, and irritation. Chemicals like "Nonoxynol" in washes repress *Lactobacillus crispatus*, transforming microbial balance. Disruption from these products heighten risks of infections and malignancies, particularly cervical and ovarian cancers. *Lactobacillus spp.*, produces lactic acid, hydrogen peroxide, and bacteriocins which inhibit pathogens. However, frequent use of these products alters this microbial composition, and overgrowth of potentially carcinogenic pathogens like *Gardnerella vaginalis*, *Atopobium vaginae*, and *Sneathia spp.* These microbial changes result in chronic inflammation and high-risk HPV infections, a major cause of cervical cancer. DNA damage and endocrine disruption, key factors in oncogenesis, are linked to parabens, phthalates, and benzophenones found in feminine hygiene products. Long-term use of vaginal sprays and powders have been associated with ovarian cancer while hyperosmolar lubricants have also been shown to have cytotoxic effects on vaginal epithelial cells, making them more vulnerable to inflammatory reactions and oncogenic changes. These results underline the necessity of stringent regulation and clinical research into the long-term carcinogenic hazards associated with vaginal hygiene products. To sustain microbial balance, the focus should shift to microbiome-friendly hygiene products that minimize harmful chemical exposure. Microbial balance can be preserved with the aid of safe procedures, probiotic solutions, and biodegradable, breathable sanitary products. In order to promote safer alternatives for feminine hygiene, more research is needed to understand long-term effects.

Keywords: Vaginal Microbiota, *Lactobacillus spp.*, Nonoxynol , Endocrine disruption, Oncogenesis, Carcinogenic



Probiotics and Mental Health: Investigating the Stress-Reducing Potential of Curd

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Abstract

Stress is a common issue impacting both mental and physical health, necessitating natural and dietary interventions for effective management. Curd, a fermented dairy product rich in probiotics, bioactive peptides, and essential nutrients, has garnered attention for its potential role in reducing stress and promoting overall well-being. The probiotics in curd, particularly species of *Lactobacillus* and *Bifidobacterium*, positively influence the gut-brain axis by modulating gut microbiota, reducing inflammation, and enhancing the production of neurotransmitters such as serotonin and gamma-aminobutyric acid (GABA). These biochemical effects contribute to mood stabilization and stress reduction. Additionally, curd contains bioactive peptides with anxiolytic properties and vital nutrients like calcium, magnesium, and vitamin B12, which support nervous system function. Emerging research indicates that regular consumption of curd may help alleviate symptoms of anxiety and depression by regulating cortisol levels and improving gut health. This review examines the mechanisms through which curd exerts its stress-reducing effects and emphasizes its potential as a natural dietary approach for mental well-being.

Keywords: Mental Health, Curd, Anxiety, Gut brain connection



Data Mining Techniques in Food Safety: Analyzing Microbial Data for the Detection of Irradiated Foods

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Abstract:

Irradiation is increasingly employed as an effective method for preserving food, providing an alternative to traditional preservation techniques while maintaining food quality, nutritional value, and safety. By applying controlled doses of ionizing radiation, such as gamma rays or electron beams, this process disrupts the biological functions of microorganisms, insects, and parasites, extending the shelf life of various food products. However, reliably identifying irradiated foods remains an ongoing challenge, especially for regulatory purposes and consumer confidence. This study explores microbiological techniques for detecting irradiated food, focusing on the Direct Epifluorescent Filter Technique (DEFT) and Aerobic Plate Count (APC) methods, applied to food samples such as milk, black pepper, and strawberries. These methods detect microbial changes that occur due to irradiation, offering a means to monitor the effectiveness of this preservation technique. The study further integrates data mining classifiers, such as WEKA, to analyse microbial data and assess the ability of these methods to distinguish between irradiated and non-irradiated food samples.

Results indicated that DEFT/APC effectively tracked microbial shifts in response to varying irradiation doses. While DEFT counts remained stable, APC counts progressively declined as the radiation dose increased. The ratio of DEFT to APC provided a reliable indicator of irradiation, proving to be a simple, cost-effective, and non-invasive method for identifying irradiated foods. This approach has significant potential in food safety, ensuring compliance with regulatory standards, and improving quality control across the food industry.

Keywords: Food irradiation, DEFT, APC, Microbial detection, Food safety, Irradiation dose, Regulatory compliance



Microbiome and metabolic health: Gut dysbiosis in PCOS and its role in insulin Resistance

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Abstract

The gut microbiome plays a vital role in metabolic and endocrine health, ascendancy on insulin sensitivity, inflammation, and hormonal balance. Polycystic Ovary Syndrome(PCOS), a prevailing endocrine dysfunction, has been linked to gut microbiota dysbiosis. Alternation in microbial composition, such as reduction in Lactobacillus and Bifidobacterium species, or an overgrowth of pro-inflammatory species contribute highly towards endotoxemia and reduced Short-Chain Fatty Acid(SCFA) production. Androgen excess via bile acid metabolism and gut-brain axis interactions amplify the PCOS. These factors impair insulin signaling and lipid metabolism, which further fuels insulin resistance and low-grade chronic inflammation. This interplay between microbiome and metabolic dysfunction in PCOS presents a scope for microbiota-targeted therapies, including probiotic, prebiotics, and other dietary interventions, to restore the microbial equilibrium. This presentation will further explore the mechanistic link between the gut microbiota and PCOS, highlighting its implications for insulin resistance and potential microbiome-based therapeutic strategies. Additionally, investigating gut microbiota as a potential biomarker could facilitate early diagnosis, disease monitoring, and personalized treatment strategies. By shedding light on the mechanistic link between gut dysbiosis and PCOS, this poster aims to highlight its role in insulin resistance and explore microbiome-based therapeutic approaches that may mitigate metabolic dysfunction and pave the way for precision medicine in PCOS management.



Sustainable Packaging of Fermented Food(s)

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Abstract

Fermentation is an age-old traditional process that converts food types into forms that have physically and chemically appealing characteristics. Fermented food products are known for their enhanced nutritional profile, probiotic benefits, bioavailability, and disease prevention. However, the challenge with fermented food products is the requirement for specialized packaging that maintains product integrity, extends the shelf life, and minimizes the environmental impact.

This review paper focuses on exploring sustainable packaging strategies for fermented food products that prioritize biodegradable materials, active packaging technologies, and circular economy principles. To address these issues, the United Nations created Sustainable Development Goals (SDGs). Biopolymer-based packaging along with polylactic acid (PLA) and starch-based films supports SDG 12, which ensures sustainable consumption and production patterns. Similarly, SDG 2 that focuses on ending hunger can be achieved by formulating active packaging with antimicrobial agents (chitosan and essential oils). This type of packaging will also extend the shelf life of fermented food products.

As stated above, biodegradable biopolymer-based packaging materials reduce oxidative degradation and will maintain the probiotic viability in the fermented food product. Antimicrobial agents incorporated into active packaging inhibit the microorganisms that could result in spoilage.

Keywords: Sustainable packaging, Circular economy, SDGs, Biopolymer-based packaging, Active packaging



Nettle (*Urtica dioica*) as a Sustainable Nutritional Intervention for Metabolic Disorders: A Review

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Climate change has significantly impacted global agricultural practices, affecting the availability and bioactive composition of medicinal plants. These environmental shifts influence the therapeutic effectiveness of many traditionally used herbs, including Nettle. Nettle (*Urtica dioica*), a widely available but underutilized herb, has shown promising potential in managing metabolic disorders, particularly diabetes and hyperlipidemia. Rich in phenolic compounds, flavonoids, and antioxidants, nettle offers a sustainable, plant-based intervention for improving biochemical parameters. This review explores the nutritional and therapeutic properties of nettle, focusing on its role in regulating blood glucose and lipid levels. Research suggests that bioactive compounds in nettle contribute to enhanced insulin sensitivity, lipid metabolism, reduce cholesterol levels and oxidative stress reduction, making it a suitable dietary addition for individuals at risk of metabolic diseases. Also, nettle's adaptability to various climatic conditions highlights its potential as a climate-resilient nutritional resource. The review emphasizes the importance of scientific validation of traditional herbal remedies in the context of sustainable health solutions. Given the rising global burden of metabolic disorders, integrating climate-resilient medicinal plants like nettle into functional foods and nutraceuticals could serve as an accessible and eco-friendly alternative. Also, promoting the cultivation and utilization of nettle could support sustainable agricultural practices while providing local communities with a valuable nutritional resource. Further research is warranted to standardize dosage, bioavailability, and long-term efficacy in clinical applications. This study underscores the potential of nettle as a cost-effective, eco-friendly dietary solution, promoting its inclusion into preventive healthcare strategies and highlights the urgent need to bridge the gap between traditional knowledge and evidence-based nutrition science, fostering a climate-conscious approach to public health interventions.

Keywords: Nettle, Prediabetes, Hyperlipidemia, Antioxidants, Climate-Resilient Nutrition



Technical Session 4 : Ideathon Competition



Universal artificial blood development!

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Abstract

Blood transfusions are essential for modern medicine, yet supply shortages and compatibility issues pose significant challenges. This research explores the potential of developing artificial blood by utilizing blood group B's natural immune response against blood group A.

By isolating and studying anti-A antibodies from blood group B plasma, we aim to engineer synthetic red blood cells (RBCs) with adaptive antigen properties. The research methodology involves biochemical and synthetic biology techniques to modify RBCs, ensuring their stability, oxygen-carrying capacity, and immune compatibility. In vitro testing and preclinical trials will assess their viability before potential clinical applications.

Ethical considerations, including biocompatibility, regulatory approval, and long-term safety, are paramount to ensure successful implementation. The expected outcomes of this study include the development of a universal blood substitute that reduces dependence on donations, enhances emergency and military medical applications, and improves accessibility through scalable production. Future innovations may extend to organ preservation and disease treatments, marking a significant advancement in biomedical science.

This research aligns with SDG 3 (Good Health & Well-being), SDG 9 (Industry, Innovation & Infrastructure), SDG 12 (Responsible Consumption & Production), and SDG 17 (Partnerships for the Goals) by advancing medical innovation, ensuring sustainable blood supply, and fostering global collaborations.

Keywords - Artificial Blood, Blood Group B, Synthetic Red Blood Cells, Immune Response, Biocompatibility, Transfusion Medicine.



Rubisco-Based Biocatalytic Filters for On-Vehicle CO₂ Capture

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Abstract

The rising levels of atmospheric CO₂ demand innovative solutions for reduction of its emission. This research proposes a bio-inspired approach to CO₂ capture from car exhaust using Ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco), the key enzyme in photosynthetic carbon fixation. While Rubisco's ability to capture CO₂ is well established, its slow catalytic rate and oxygen sensitivity present challenges for practical application. This study aims to overcome these limitations through enzyme engineering, immobilization, and optimized bioreactor design. Initially, a suitable Rubisco variant will be selected and genetically modified using directed evolution and site-directed mutagenesis to enhance CO₂ affinity and reduce oxygen reactivity. Engineered Rubisco will then be immobilized in a protective matrix, such as a porous polymer or metal-organic framework (MOF), to enhance stability under exhaust conditions. A compact bioreactor system will be designed to maximize gas-enzyme interaction, incorporating pre-treatment stages to remove particulates and regulate exhaust temperature. Computational fluid dynamics (CFD) simulations will optimize reactor geometry and flow patterns for efficient CO₂ capture.

The system will be evaluated through laboratory-scale testing under simulated car exhaust conditions, assessing CO₂ capture efficiency, enzyme stability, and system durability. Expected outcomes include (1) development of enhanced Rubisco variants, (2) creation of a robust immobilization matrix, (3) design of a compact, on-vehicle bioreactor, and (4) demonstration of the feasibility of Rubisco-based CO₂ capture. This research could provide a sustainable, bio-inspired solution for mitigating vehicular emissions, complementing existing reduction strategies, and advancing biocatalytic CO₂ capture technologies.

Keywords: Rubisco, emission,



Why is interstitial lung disease a serial killer – and are we doing enough to stop it?

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Abstract

Interstitial Lung Disease (ILD) is a surreptitious and often fatal condition that progressively robs patients of their ability to breathe. Characterized by relentless lung scarring, ILD leads to severe respiratory decline, with some forms, such as idiopathic pulmonary fibrosis, having a prognosis worse than many cancers. Despite its devastating impact, ILD remains underdiagnosed, misunderstood, and largely untreatable due to its complex interplay of genetic, environmental, and immunological factors. Misdiagnosis and delayed intervention are common due to overlapping clinical and radiological features, underscoring the need for more refined diagnostic tools.

A promising innovation in ILD diagnosis is Nanoparticle-Based Blood Biomarker Detection, including Surfactant Protein A (SP-A) and Surfactant Protein D (SP-D), which are critical for lung immunity and surfactant homeostasis. ILD patients exhibit specific protein and genetic biomarkers in their blood, including MMP-7, KL-6, SP-A, and SP-D. A nanotechnology-based biosensor can detect these biomarkers with a simple finger-prick blood test, providing a rapid and non-invasive diagnostic alternative. AI-driven analysis of biomarker levels can further improve early disease risk prediction, allowing for timely intervention before irreversible fibrosis occurs. Additionally, combining this with high-resolution imaging and machine learning could enhance diagnostic accuracy and enable more personalized treatment approaches.

Advancements in imaging, biomarker discovery, and genomic research have shown promise, but these technologies must become more accessible. Current treatments, such as antifibrotic agents and immunosuppressive therapies, only slow disease progression, and lung transplantation remains an option for end-stage cases with significant limitations. Expanding research into novel regenerative therapies, including stem cell transplantation and bioengineered lung tissue, may offer future hope. Prioritizing ILD research and integrating innovative diagnostic tools can enable earlier detection, targeted treatments, and improved patient outcomes, ultimately transforming ILD care and survival rates.

Keywords: Interstitial Lung Disease, Surfactant Protein, earlier detection, Misdiagnosis, is Nanoparticle-Based Blood Biomarker Detection



Impact of climate on development (Health, Nutrition, Agriculture, Resources and Environment)

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Abstract

Climate change is one of the most pressing global challenges, significantly influencing various aspects of development, including health, nutrition, agriculture, resources, and the environment. Rising global temperatures, extreme weather events, and shifting climatic patterns disrupt food production, exacerbate health risks, deplete natural resources, and threaten biodiversity. This paper explores the multifaceted impacts of climate change on development, highlighting how vulnerable communities face disproportionate consequences. The research employs a mixed-method approach, drawing from peer-reviewed literature, case studies, and global climate reports to analyze the correlation between climate change and key development indicators. Findings indicate that climate-induced disruptions lead to increased incidences of vector-borne diseases, food insecurity, reduced agricultural yields, freshwater shortages, and ecosystem degradation. Additionally, socio-economic disparities are intensifying, with marginalized populations experiencing the most severe repercussions. The discussion delves into adaptive strategies, policy interventions, and the role of international cooperation in mitigating climate change's adverse effects. Ultimately, this study underscores the urgent need for sustainable development practices and climate resilience initiatives to safeguard human well-being and ecological balance.

Keywords: Climate change, health, nutrition, agriculture, resources, environment



The Living Chimney: Harnessing Microbes for Purification

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Abstract

Industries in Delhi NCR, particularly those involved in manufacturing and power generation, are significant contributors to particulate matter (PM_{2.5} and PM₁₀), sulfur dioxide (SO₂), and nitrogen oxides (NO_x) emissions, accounting for 44% of PM_{2.5} emissions in the region. To address this issue, a novel chimney filter utilizing thermophilic chemoheterotrophic microorganisms is proposed. These microorganisms, such as *Thermus thermophilus* or *Thermus aquaticus*, thrive at elevated temperatures and derive nutrition from organic compounds present in industrial emissions. The chimney filter is structured as a multi-layered biofiltration system. The microorganisms are immobilized on a biofilm matrix composed of alginate beads enriched with activated carbon to enhance adsorption capacity. These beads are housed within modular trays inside the chimney, facilitating maintenance and scalability. A nutrient medium containing essential organic compounds is continuously supplied via a drip irrigation system integrated into the chimney structure. This approach ensures optimal microbial activity while conserving water resources. To further enhance pollutant removal, ion exchangers composed of zeolite are incorporated to capture heavy metals such as lead and cadmium from emissions. Furthermore, biosorbents, including chitosan-coated materials, are utilized to adsorb volatile organic compounds (VOCs) and other gaseous pollutants. The chimney filter is designed to be stationary; however, it can be disassembled and reassembled for relocation if necessary. This system not only reduces harmful emissions but also contributes to environmental sustainability by utilizing biological processes for air purification.

Keywords: Thermophilic microbes, Biofiltration, Industrial pollution, Biosorbents, Ion exchangers.



Combating Antimicrobial Resistance: Targeting Essential Bacterial Metabolism

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Abstract

Antimicrobial resistance (AMR) is a major threat to global health. Bacteria are finding ways to outsmart the drugs. Bacterial resistance, acquired through mutations and transfer of gene responsible for antimicrobial resistance from a resistant bacterial cell to a sensitive one by mechanisms like transformation, transduction and conjugation, enables pathogens to evade the lethal effects of drugs, leading to treatment failures. Consequently, novel therapeutic strategies are urgently needed. This paper proposes a targeted approach focused on disrupting essential bacterial survival mechanisms rather than directly combating resistance. Specifically, we explore the potential of targeting the mRNA encoding key enzymes of glycolytic pathway like Entner Doudoroff (ED), Pentose Phosphate Pathway (PPP), Hexose monophosphate (HMP) shunt and methylglyoxal shunt. By designing antisense oligonucleotides complementary to the target mRNA, we aim to inhibit translation and disrupt central metabolism. This strategy minimizes the possibility of development of resistance in the bacteria, as modifications to the targeted sequence would impose a significant metabolic burden on the bacteria, rendering it energetically inefficient. This approach offers a promising avenue for combating AMR by targeting essential bacterial processes, circumventing traditional resistance mechanisms and paving the way for the development of novel, sustainable antimicrobial therapies.

Keywords: Antimicrobial resistance; Novel therapeutic strategies; Metabolism; Antisense oligonucleotides; Global health.



Using Antimicrobial Resistance Strategies to Strengthen Marburg Virus Vaccines

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Abstract

The Marburg virus (MARV), which belongs to the Filoviridae family, is known for causing a severe form of hemorrhagic fever, with fatality rates ranging from 24% to 88%. Despite a lot of research efforts, we still don't have any licensed vaccines or antiviral treatments available. Some candidates, like ChAd3-MARV and rVSV-MARV, focus on the viral glycoprotein (GP), but they encounter issues such as short-lived immunity and challenges with storage.

In our study, we highlight how mechanisms of antimicrobial resistance (AMR) can actually help in developing a vaccine for MARV. The pathways associated with AMR, especially bacterial efflux pumps and changes in membranes, offer valuable insights into how we can stabilize antigens and evade the immune system. By integrating structural adaptations derived from AMR into vaccine design, we could improve the stability of GP-based immunogens and extend immune responses, which would reduce the need for frequent booster shots. Moreover, adjuvants linked to AMR, inspired by how bacteria resist threats, might enhance the T-cell and antibody responses triggered by the vaccine, leading to better long-term protection.

Research on AMR also sheds light on how we can improve vaccine delivery methods. For instance, nanoparticle carriers that mimic how bacteria resist host immunity could allow for controlled release of antigens and targeted activation of the immune system, which would help in forming lasting immune memories. By examining how resistant bacterial strains manage to dodge immune detection, we can refine our strategies for MARV vaccines to boost their durability and effectiveness. Considering the high potential for outbreaks of MARV and the absence of effective countermeasures, leveraging AMR-based strategies presents a fresh approach to the challenges of vaccine development. Our findings highlight the importance of interdisciplinary research that combines virology and antimicrobial resistance to create vaccines that are more stable, effective, and accessible.

Keywords - Marburg virus, Vaccine development, Glycoprotein, Immunogenicity, Viral vector Vaccine



Microbial Self-Healing Roads & Buildings

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Abstract

Urban infrastructure is constantly deteriorating due to weathering, traffic loads, and environmental pollutants. Traditional concrete repair methods are costly and time-consuming, often leading to recurring structural damage. This project introduces self-healing concrete infused with bioengineered *Bacillus megaterium*, a bacterium capable of secreting limestone (calcium carbonate) when exposed to water, automatically sealing cracks and preventing further degradation. To enhance its environmental benefits, the engineered microbes will also be designed to capture urban air pollutants, particularly CO₂, and convert them into solid carbonate structures, making buildings and roads both self-repairing and climate-positive. Unlike conventional self-healing concrete, which relies on encapsulated spores, this approach employs genetically optimized microbes with enhanced durability and metabolic efficiency, ensuring sustained activity over long periods. The integration of microbial self-healing technology could extend infrastructure lifespan by decades, significantly reducing repair costs and environmental impact. Moreover, in regions prone to extreme weather conditions, such as earthquakes or heavy rains, self-healing buildings could mitigate structural failures, reducing risks of collapses and human casualties. By merging civil engineering with biotechnology, this innovation presents a sustainable and cost-effective solution for modern infrastructure challenges. Future research will focus on optimizing microbial viability in various environmental conditions and scaling the technology for large-scale urban applications, offering a revolutionary shift in construction and environmental sustainability.

Keywords: Self-healing concrete, Bioengineered *Bacillus megaterium*, Limestone (calcium carbonate) secretion, Urban air pollutant capture, Microbial self-healing technology



Microbial Skin Coating for UV Protection & Skin Repair

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Abstract

Excessive exposure to ultraviolet (UV) radiation from the sun is a leading cause of skin damage, premature aging, and skin cancers. Current sunscreens contain synthetic chemicals that may harm marine ecosystems and lose effectiveness over time. This study proposes a microbial-based "living sunscreen", utilizing genetically engineered bacteria that produce melanin and antioxidants in response to sunlight. These microbes, applied as a spray or cream, form a dynamic protective layer on the skin, adapting to UV exposure levels by increasing melanin synthesis in real-time. Additionally, they secrete natural antioxidants and anti-inflammatory compounds to repair sunburned cells and prevent DNA damage. Unlike traditional sunscreens that degrade with time or wash away, this biodegradable and eco-friendly microbial coating remains active throughout prolonged sun exposure, reducing the need for frequent reapplication. Furthermore, the engineered microbes could be modified to enhance collagen production, providing secondary benefits such as wound healing and anti-aging effects. The innovation bridges synthetic biology, dermatology, and environmental sustainability, offering a safer alternative to chemical based sunscreens while addressing growing concerns over coral reef destruction and human skin health. Future research will focus on optimizing microbial stability, safety, and user compatibility, paving the way for a next-generation bioactive skincare solution that protects, heals, and rejuvenates the skin naturally.

Keywords: Microbial-based sunscreen, Genetically engineered bacteria, Melanin production, Environmental sustainability, Bioactive skincare



Gallbladder Cancer – A Silent Threat Tied to Our Environment and Health

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Abstract

Gallbladder cancer (GBC) is silent in their early onset, is a rare but very aggressive cancer that is usually diagnosed at an advanced stage. This case study illustrates how a patient who presents with chronic acidity, moves through the path and eventually reveals metastatic gallbladder cancer. The patient, a non-drinker and a non-smoker, had severe acidity and stomach rigidity for a few days, for which he sought treatment, and an ultrasound done showed gallstones and fluid collection. However, when blood was drawn from the stomach, the presence of fluid was noticed and after the removal of the fluid, a biopsy was done to confirm the malignancy of GBC. The patient died from the disease five months after diagnosis despite having chemotherapy and frequent paracentesis for ascites. This raises a number of concerns about the management of GBC, diagnosis of the disease at an early stage, and the primary causes of the disease. Why did we not see the cancer at an earlier stage? Should we develop early screening biomarkers? However, cholesterol elevation and gallstones are now known risk factors, but their precise role in carcinogenesis is still not well understood. In this case, the difficulty in performing cholecystectomy is a reflection of the problems of late diagnosis of the gallbladder, where metastases are typically such that surgery is usually impossible. The standard care for advanced GBC, chemotherapy, is not very effective and has many side effects, which highlights the need for novel strategies. This study also highlights the need for sensitive screening tests, new and better treatments and more information on the role of environment and life style in the causation of GBC. With regard to gaps identified, it would be possible to decrease the mortality rate from this silent killer.

Keywords: Gallbladder cancer, Early diagnosis, Biomarkers, Chemotherapy



A shift towards the Algae based Pads

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Abstract

Sanitary waste is an emerging environmental and health emergency, with traditional plastic-based sanitary pads degrading only after 500–800 years. India alone produces approximately 12.3 billion disposable pads every year, contributing to plastic pollution and health hazards. This study investigates algae-based biodegradable sanitary pads as a green alternative, supporting SDGs 3 (Good Health and Well-being), 5 (Gender Equality), and 12 (Responsible Consumption and Production). Current research points to the deleterious effects of synthetic pads, such as exposure to chemicals and microplastic pollution, while alternatives such as biodegradable banana fiber and bamboo continue to be expensive and less accessible. Algae bioplastics have shown the potential for high absorbency, biodegradability, and affordability. The study seeks to determine the environmental cost of synthetic sanitary pads, examine the viability of algae-based materials, and compare affordability and accessibility in India. A mixed-method design will be followed, involving literature review, in-depth interviews of environmentalists and health professionals as experts, and knowledge about biodegradable menstrual products. Ethics involved are, confidentiality of the data, and prioritizing menstrual health accessibility. Anticipated outcomes indicate that sanitary pads made from algae have the potential to be a viable, sustainable solution, minimizing damage to the environment while enhancing menstrual health. The research aims to inform policy and stimulate investment in environmentally friendly menstrual hygiene products, providing a scalable, sustainable means of managing menstrual waste.

Keywords: Sanitary waste, Menstrual hygiene, Biodegradable pads, Algae based pads, Sustainable menstrual products, Chemical free approach



***Nannochloropsis* as an environmental marvel**

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Abstract

In the 21st century with the increase of population and urbanization the dependence on fossil fuels and natural resources have increased and we have also polluted a number of rivers and other ecosystems. For a more sustainable and futuristic approach I have presented that how some microalgae like of the genus *Nannochloropsis* can help us to achieve our sustainability goals by using its carbon dioxide usage, wastewater management and biofuel formation ability

Many microalgae have shown tremendous help and useful function to us, talking about *Nannochloropsis*, it is a genus of green microalgae belonging from order Eustigmatophyceae, they effectively remove pollutants like nitrogen and phosphorus, mitigating eutrophication, and some species can also absorb carbon dioxide, resulting algal biomass can be repurposed for biofuels, animal feed, or other applications

The idea revolves around using *Nannochloropsis* and certain microalgae in ways that can be use full and very effective for us, we know that cultivation and extraction of biofuel can be done from *Nannochloropsis* due to it having a large lipid content paring this property with certain other qualities of *Nannochloropsis* can give solution to a large number of our problems. I have focused on how can we solve the Yamuna pollution problem with microalgae cultivation, *Nannochloropsis* cultivation in Yamuna River can decrease the pollution by using up heavy metals from industrial wasted like lead, organic waste that is being dumped into the river and it can also absorb nitrogen and phosphorus and produce valuable biomass. While growing *Nannochloropsis* also absorbs carbon dioxide reducing greenhouse effect.

Keywords: *Nannochloropsis*, Yamuna River, Biofuel, Microalgae