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INTERNATIONAL CONFERENCE

on Multidisciplinary Research & Current Trends in Sustainable Development

CONFERENCE PROCEEDINGS

Editors

Dr. P.S. Chouhan

Dr. Ravi Kant Modi

CONFERENCE PROCEEDINGS

MARCH, 2025

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INTERNATIONAL CONFERENCE

ON

MULTIDISCIPLINARY RESEARCH &

CURRENT TRENDS IN SUSTAINABLE DEVELOPMENT

(ICMRCSD - 2025)

Edited by:

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Shree Tagore College, Kuchamancity

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Professor & Dean, School of Commerce and Management
NirwanUnviersity Jaipur, Rajasthan

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(ICMRCSD-VIRTUAL-2025)

21-22 MARCH 2025
(03:30 pm (IST) onwards)

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International Conference
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Senior Lecturer in International Business
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Faculty of Computer Applications
Rajasthan Technical University, Kota

Message

I am delighted to extend my heartfelt congratulations to Shree Tagore College, Kuchaman City, for organizing the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on March 21-22, 2025.

In today's rapidly evolving world, sustainable development has become a crucial aspect of academic and policy discussions. This conference serves as a valuable platform for scholars, researchers, and academicians from various disciplines to collaborate and exchange ideas that will contribute to a more sustainable and progressive future.

The integration of multidisciplinary research with sustainable development strategies is essential for addressing global challenges, and I appreciate the efforts of *Shree Tagore College* in fostering such intellectual discourse. I am confident that this conference will bring forward innovative solutions and insightful discussions that will benefit society at large.

I extend my best wishes to all the participants, organizers, and esteemed guests for the grand success of ICMRCSD-VIRTUAL-2025. May this event inspire meaningful research and lead to constructive outcomes for a better tomorrow.

Vijay Singh
State Minister
(Revenue Department, Colonization Department,
Soldier Welfare Department)
Government of Rajasthan
MLA, Nawan Constituency

Message

I am pleased to extend my warm greetings and best wishes to Shree Tagore College, Kuchaman City, on the occasion of the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025). This conference serves as a vital platform for scholars, researchers, and academicians from diverse disciplines to exchange knowledge and innovative ideas in the pursuit of sustainable development.

In today's world, where environmental concerns, technological advancements, and socio-economic challenges intersect, it is crucial to foster interdisciplinary collaboration to achieve sustainable solutions. The efforts of Shree Tagore College in organizing such a prestigious event highlight its commitment to academic excellence and societal progress.

I commend the organizers, researchers, and participants for their contributions to this noble cause. May this conference inspire meaningful discussions, drive impactful research, and pave the way for a sustainable and prosperous future.

Best wishes for the grand success of ICMRCSD-VIRTUAL-2025!

Mahendra Chaudhary
Ex-Deputy Chief Whip, Rajasthan Legislative Assembly
Ex-Member, Committee on Public Undertakings
Rajasthan Legislative Assembly
Ex-MLA, Nawan Constituency

Message

I am honored to extend my heartfelt congratulations to Shree Tagore College, Kuchaman City for organizing the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21-22 March 2025.

This conference is a significant platform for scholars, researchers, and academicians from various disciplines to share their insights and innovative ideas. In today's rapidly evolving world, sustainable development is not just an academic discussion but a necessity for global progress. The multidisciplinary approach of this conference will undoubtedly contribute to meaningful discussions that can lead to real-world solutions for a sustainable future.

I appreciate the efforts of the organizing committee, faculty members, and participants who have come together to make this conference a success. May this event foster knowledge exchange, research collaborations, and impactful contributions toward a better tomorrow.

Best wishes for the grand success of ICMRCSD-VIRTUAL-2025!

Hari Ram Ranwa
Former State President
BJP Kisan Morcha Rajasthan,
Former District President BJP Sikar

Message

It is a matter of great pride and honor for me to extend my heartfelt congratulations on the occasion of the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21st–22nd March 2025. This conference is a significant platform for scholars, researchers, and academicians from diverse fields to engage in meaningful discussions, share innovative ideas, and contribute to the advancement of knowledge across multiple disciplines.

Tagore Education Group has always been committed to fostering academic excellence, research, and holistic education. Such conferences play a crucial role in broadening intellectual horizons, encouraging collaboration, and addressing contemporary global challenges. I am confident that this event will inspire new perspectives, promote interdisciplinary learning, and lead to impactful research contributions.

I extend my gratitude to all the distinguished speakers, researchers, and participants who have come together to make this conference a grand success. I also commend the organizing committee, faculty members, and students for their dedication and hard work in bringing this prestigious event to fruition.

Wishing all participants a fruitful and enlightening experience!

Best Regards,

Puran Singh Ranwa
Conference Patron &
Chairman
Tagore Education Group, Kuchaman City

Message

On behalf of the Inspira Research Association, I extend a warm welcome to all participants of the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development 2025. It is with great enthusiasm that we gather virtually on March 21-22, 2025, to explore the cutting-edge advancements in sustainable development across various disciplines.

As the world faces increasingly complex environmental, social, and economic challenges, the importance of interdisciplinary collaboration has never been more evident. This conference provides a unique platform for thought leaders, researchers, and practitioners from around the globe to come together, share their knowledge, and inspire innovative solutions for a sustainable future.

We are proud to showcase a wide range of insightful presentations, discussions, and research contributions that highlight the latest trends and transformative approaches in sustainability. It is through these collaborations that we can hope to drive meaningful progress and address the most urgent issues facing our planet.

Thank you for joining us, and I look forward to the inspiring and productive conversations that will unfold over the next two days.

With best regards,

Prof. (Dr.) S.S. Modi
Conference Patron &
President
Inspira Research Association

Message

It is a matter of immense pride and joy that Shree Tagore College, Kuchaman City, successfully organized the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21st–22nd March 2025. This conference provided a dynamic platform for researchers, academicians, and scholars from various disciplines to share their insights, innovations, and research contributions.

The world today is evolving rapidly, and interdisciplinary research plays a crucial role in addressing complex global challenges. This proceeding book is a testament to the intellectual rigor and scholarly contributions presented during the conference. It encapsulates diverse research papers that reflect the academic excellence and dedication of our participants.

I extend my heartfelt gratitude to all the distinguished speakers, researchers, and delegates who enriched the conference with their valuable insights. A special appreciation goes to the organizing committee, faculty members, and students whose relentless efforts made this event a grand success.

I am confident that this proceeding book will serve as a valuable resource for scholars and researchers, inspiring further studies and innovations in multiple domains.

Best wishes for continued academic excellence!

Sitaram Chaudhary
Conference Co-Patron &
Director, Shree Tagore College
Kuchaman City

Message

It is a matter of great pride and honor for Shree Tagore College, Kuchaman City, to host the for organizing the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21st–22nd March. This academic gathering brings together distinguished scholars, researchers, and professionals from diverse fields to exchange ideas, share knowledge, and explore innovative solutions to contemporary global challenges.

In today's rapidly evolving world, multidisciplinary research plays a crucial role in fostering holistic growth and addressing complex issues. This conference serves as a platform for intellectual engagement, encouraging collaboration and critical discussions that contribute to the advancement of education, science, technology, humanities, and social sciences.

I extend my heartfelt gratitude to all the esteemed guests, keynote speakers, research scholars, and participants who have joined us for this significant event. I also commend the dedicated efforts of the organizing committee, faculty members, and students who have worked tirelessly to make this conference a grand success.

May this event inspire new ideas, meaningful collaborations, and impactful research for the betterment of society.

Wishing you all a fruitful and enriching experience!

Rajesh Chaudhary
Conference Co-Patron &
Secretary
Shree Tagore College, Kuchaman City

Message

It's a matter of great pleasure that a two-day International Conference on Multidisciplinary Research & Current Trends in Sustainable Development is being organized jointly by Shri Tegore College, Kuchaman City and Inspira Research Association, Jaipur.

This two-day conference will serve as a dynamic platform for scholars, researchers, academicians, and professionals from diverse disciplines to engage in meaningful discussions and exchange innovative ideas on sustainability—a topic of paramount importance in today's rapidly evolving world. The challenges of sustainable development call for a multidisciplinary approach, and we hope this conference fosters insightful deliberations and inspires impactful research contributions. We extend our heartfelt gratitude to all esteemed dignitaries, chairpersons, keynote speakers, participants, and organizing members whose dedication and efforts have made this event possible. May this gathering pave the way for future collaborations and a deeper understanding of sustainable solutions for a better tomorrow.

Wishing everyone a successful and enriching conference!

Dr. Anil Mehta
Vice President
Inspira Research Association, Jaipur &
Professor, Department of Legal Studies
Banasthali Vidyapth, Banasthali (Distt. Tonk) Rjasthan

Message

It is with great honor and enthusiasm that I extend my warmest greetings to all esteemed participants, scholars, and researchers attending the International Conference on Multidisciplinary Research & Current Trends in Sustainable Development (ICMRCSD-2025). This prestigious conference serves as a dynamic platform for intellectual discourse, fostering collaboration among academia, industry, and policy-makers to address the pressing challenges of sustainability across various disciplines.

As the Chairperson of Technical Session-I, I am privileged to be part of this significant gathering that promotes knowledge exchange and interdisciplinary research. The evolving landscape of sustainable development necessitates collective efforts, innovative approaches, and pragmatic solutions to build a resilient future. This conference provides an excellent opportunity for scholars to present their pioneering work, engage in thought-provoking discussions, and contribute to shaping policies and practices for sustainable growth.

I commend Shree Tagore College, Kuchaman City and Inspira Research Association, Jaipur for their unwavering commitment to academic excellence and research promotion. Their efforts in organizing this conference exemplify the power of collaborative inquiry and intellectual progress.

I look forward to engaging discussions, insightful presentations, and meaningful networking that will undoubtedly leave a lasting impact on all participants. Let us together explore innovative ideas and drive forward the agenda of sustainability for a better and more inclusive world.

Wishing everyone a fruitful and enriching conference!

Warm regards,

Prof. CS (Dr) Manvinder Singh Pahwa
Professor, Department of Commerce
Dr. Harisingh Gour Vishwavidyalaya (A Central University)
Sagar, M.P., India

Message

I am delighted to extend my heartfelt congratulations to Shree Tagore College, Kuchaman City, for organizing the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21st–22nd March 2025. This prestigious event serves as a significant platform for scholars, researchers, and academicians to engage in meaningful discussions on sustainability and interdisciplinary advancements.

In the present era, sustainable development is not just an academic concept but a global necessity. The integration of multiple disciplines in research is essential to address the complex challenges posed by climate change, environmental degradation, and socio-economic disparities. I commend the organizers for fostering an environment that encourages innovative solutions and academic collaboration to create a sustainable future.

I am confident that this conference will lead to valuable insights and constructive dialogues, paving the way for progressive research and impactful contributions to society. My best wishes to all the participants, researchers, and organizers for a successful and enriching event.

Prof. Gajendra Pal Singh
Professor, Department of Botany
University of Rajasthan Jaipur &
Principal
University Maharaja's College, Jaipur,

Message

It is a matter of immense pleasure that Shree Tagore College, Kuchaman City is organizing the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) on 21st–22nd March 2025. This conference serves as a remarkable platform for researchers, academicians, and scholars from diverse disciplines to exchange innovative ideas, present their findings, and contribute to the collective goal of sustainable development.

Sustainability is the need of the hour, and multidisciplinary research plays a crucial role in addressing global challenges, from climate change to biodiversity conservation. The fusion of knowledge from various domains ensures a holistic approach to finding solutions that are effective and long-lasting. I am confident that this conference will foster insightful discussions and collaborations that will pave the way for meaningful advancements in research and development.

I extend my best wishes to the organizing team and all the participants for a successful and fruitful conference. May this event inspire groundbreaking research and contribute significantly to our journey towards a sustainable future.

With my best wishes for a productive and inspiring event!

Prof. Reena Vyas
Professor & Head
Department of Zoology
Smart Prithviraj Chauhan Government College, Ajmer

Message

It gives me immense pleasure and a deep sense of honor to be associated with the *International Virtual Conference on Research and Innovations in Artificial Intelligence, Environment, Management & Sustainability (ICAIEMS - VIRTUAL 2025)* as a Guest of Honor. This conference serves as an exemplary initiative to bring together some of the brightest minds from academia, research, and industry to exchange ideas and foster collaborations on pressing global challenges.

The themes of this conference—artificial intelligence, environment, management, and sustainability—are not only timely but also pivotal in shaping the future of our global economy and society. Artificial intelligence, with its transformative capabilities, has the potential to revolutionize industries, improve efficiencies, and create innovative solutions for challenges that were once thought insurmountable. Similarly, sustainability and environmental stewardship are now global imperatives, calling for robust research and innovative management practices to ensure a better world for future generations. I commend the organizing committee for their tireless efforts in curating this multidisciplinary platform that encourages not only academic rigor but also practical solutions to real-world problems. Such conferences are invaluable in providing opportunities for knowledge dissemination, fostering partnerships among institutions, and inspiring young researchers to think critically and creatively.

I sincerely hope that this conference will catalyze meaningful conversations, inspire innovative research, and build lasting connections that contribute to the advancement of knowledge in these critical areas. I am confident that the esteemed participants will leverage this platform to exchange groundbreaking ideas and solutions that will drive positive change globally.

I extend my warmest wishes for the grand success of this event and look forward to witnessing the incredible ideas and insights that will emerge from it. My gratitude once again to the organizers for inviting me to be a part of this inspiring journey.

Vikas Garg, PhD
Associate Professor, (Research)
Symbiosis Institute of Business Management, Noida,
Symbiosis International (Deemed University), Pune, India

Message

It is with immense pleasure and a deep sense of academic commitment that I welcome you all to the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development (ICMRCSD-VIRTUAL-2025) in collaboration with INSPIRA Research Association on March 21-22, 2025, at Shree Tagore College, Kuchaman City. This prestigious event is a confluence of intellectual minds, bringing together scholars, researchers, academicians, and professionals from diverse disciplines to share their knowledge, insights, and innovative research.

The world today is evolving at an unprecedented pace, demanding interdisciplinary approaches to address contemporary challenges. This conference serves as a platform for thought-provoking discussions, fostering collaborations across various domains, including science, technology, social sciences, management, humanities, and environmental studies. Through this, we aim to contribute to the global academic community by promoting research that bridges gaps and opens new frontiers of knowledge.

We are honored to collaborate with INSPIRA Research Association, a reputed institution committed to academic excellence and research promotion. Their support has been instrumental in shaping this event into a meaningful and enriching experience. I extend my heartfelt gratitude to all keynote speakers, presenters, delegates, and participants who have joined us to make this conference a success.

I hope this event ignites new ideas, strengthens academic networks, and inspires future research endeavors and this publication serves as a valuable reference for researchers and inspires further academic discourse. Let us continue our pursuit of knowledge and innovation for the betterment of society. Wishing all participants a fruitful and intellectually stimulating experience!

Dr. P.S. Chouhan
Conference Organizing Director, ICMRCSD-2025 &
Principal, Shree Tagore College, Kuchaman City

Message

On behalf of the *Inspira Research Association* and as the Organizing Director of the *International Conference on Multidisciplinary Research and Current Trends in Sustainable Development 2025*, I am delighted to welcome all participants to this virtual gathering.

The theme of this conference, "Multidisciplinary Research and Current Trends in Sustainable Development," is particularly timely as we navigate the pressing global challenges in sustainability and innovation. We are honored to bring together researchers, scholars, practitioners, and experts from diverse disciplines to share their invaluable insights, research findings, and best practices.

The contributions from all participants will not only enrich our collective understanding of sustainable development but also pave the way for meaningful solutions to current and future challenges. This conference serves as an important platform for fostering collaboration and inspiring action towards a more sustainable and resilient future.

I would like to extend my heartfelt gratitude to all speakers, presenters, and delegates for their commitment and involvement. Together, we will continue to push the boundaries of knowledge and create impactful, sustainable solutions for communities worldwide.

Thank you for being a part of this extraordinary event, and I look forward to the fruitful discussions and exchanges ahead.

With best regards,

Prof. (Dr.) Ravi Kant Modi
General Secretary
Inspira Research Association-IRA &
Professor & Dean, Commerce & Management
Nirwan University Jaipur

Message

It is with great enthusiasm that I present before you the International Conference on Multidisciplinary Research and Current Trends in Sustainable Development- Virtual 2025. This event is a convergence of intellectual minds who are passionate about exploring technological advancements, business transformations, and sustainable growth strategies.

As the Organizing Secretary and the Joint Secretary of IRA, my goal is to help creating a platform where academia and industry engage in meaningful dialogue. The research papers, expert sessions, and discussions at this event will drive innovation, critical thinking, and real-world impact.

I extend my sincere gratitude to the team of Shree Tagore College, Kuchaman City, Rajasthan and Inspira Research Association our distinguished speakers, research contributors, and the whole organizing committee for making this conference a success. May this event inspire a culture of innovation, ethical leadership, and collaborative growth.

Best Wishes,

Dr. Aarti Chopra
Associate Professor
Poornima University, Jaipur &
Joint Secretary, Inspira Research Association

Abstracts

EXPLORING THE MULTIFACETED USES OF CASSIA TORA: A REVIEW ON ITS MEDICINAL, AGRICULTURAL, AND INDUSTRIAL APPLICATIONS

Anjali Singh

B.Sc. Part-III (Biology), Shree Tagore College, Kuchamancity

Cassia tora is a versatile medicinal plant widely recognized for its pharmacological, nutritional, and industrial applications. This paper explores the various uses of Cassia tora, highlighting its significance in traditional medicine, agriculture, food, and pharmaceutical industries. The plant, commonly found in tropical and subtropical regions, has been extensively utilized in Ayurvedic and traditional Chinese medicine due to its therapeutic properties, including anti-inflammatory, hepatoprotective, antimicrobial, and antioxidant effects. The seeds and leaves of Cassia tora are rich in bioactive compounds such as flavonoids, anthraquinones, and glycosides, which contribute to its medicinal benefits. In the pharmaceutical industry, Cassia tora is used in formulations for treating skin diseases, digestive disorders, and eye ailments. Its laxative properties make it an effective remedy for constipation, while its antimicrobial effects have been explored in treating bacterial and fungal infections. Additionally, the plant exhibits potential in managing diabetes, as studies suggest its ability to regulate blood glucose levels. Beyond medicine, Cassia tora finds applications in the food and agricultural sectors. The seeds serve as a coffee substitute and are used in food additives due to their high protein and fiber content. The plant is also employed as a natural pesticide and soil stabilizer, enhancing sustainable agricultural practices. Moreover, Cassia tora gum, extracted from its seeds, is widely utilized in the textile, paper, and cosmetic industries due to its excellent gelling and emulsifying properties. Recent scientific studies have further demonstrated the potential of Cassia tora in environmental sustainability, including its role in wastewater treatment and soil remediation. The plant's ability to grow in arid conditions makes it a promising candidate for reforestation and ecological conservation efforts. Despite its numerous applications, the large-scale utilization of Cassia tora faces challenges such as limited cultivation, processing difficulties, and the need for further research on its pharmacological mechanisms. This paper aims to provide a comprehensive review of the uses of Cassia tora, emphasizing its significance in various industries and its potential for future applications in health and environmental sustainability.

WOMEN IN POLITICS: BARRIERS, PROGRESS, AND FUTURE PROSPECTS

Anita Jangir

B.A. Part-III, Shree Tagore College, Kuchamancity

Women's participation in politics is a critical component of democratic governance and social progress. Over the past century, significant strides have been made toward gender equality in political representation, yet women continue to face multiple barriers that hinder their full participation. This paper explores the historical and contemporary challenges faced by women in politics, the progress achieved in terms of representation and policy influence, and the future prospects for gender-inclusive governance. Despite the global increase in the number of women in political leadership, systemic obstacles such as socio-cultural norms, economic disparities, and institutional biases persist. Patriarchal structures, gender stereotypes, and the underrepresentation of women in political parties and decision-making bodies continue to limit their political ambitions. Furthermore, women in politics often encounter gender-based discrimination, lack of financial resources, and inadequate support systems, making it difficult for them to enter and sustain political careers. Additionally, digital and physical threats, including online harassment and political violence, disproportionately target female politicians, further discouraging their participation. However, significant progress has been made in recent decades, with various national and international initiatives promoting women's political empowerment. Gender quotas, legal reforms, and grassroots movements have played a crucial role in increasing female representation in parliaments and leadership positions. Countries that have implemented gender-sensitive policies have witnessed positive outcomes, including improved governance, greater focus on social welfare, and policies addressing women's rights and gender equality. The success stories of female political leaders worldwide serve as an inspiration and demonstrate the transformative impact of women's participation in politics. Looking ahead, the future of women in politics depends on sustained efforts to dismantle barriers and promote inclusivity. Political parties, governments, and civil society must work collaboratively to ensure equal opportunities, mentorship programs, and protection against gender-based political violence. Strengthening women's political education, increasing access to campaign financing, and fostering a culture of gender sensitivity in governance are essential steps toward achieving true political equality. This paper concludes that while progress has been made, the road ahead requires persistent efforts to create an equitable political landscape where women can fully participate and contribute to policymaking.

BEHAVIORAL ADAPTATIONS OF DESERT FAUNA TO EXTREME CLIMATES

Anisha

B.Sc. Part-III (Biology), Shree Tagore College, Kuchamancity

Deserts are among the most extreme ecosystems on Earth, characterized by high temperatures, intense solar radiation, scarce water resources, and significant temperature fluctuations between day and night. Despite these harsh conditions, desert fauna have evolved remarkable behavioral adaptations that enable them to survive and thrive in such environments. This study explores the diverse behavioral strategies employed by desert animals to cope with extreme climatic conditions, focusing on thermoregulation, water conservation, foraging patterns, and predator avoidance. Field observations and literature reviews were conducted to analyze key behavioral adaptations in various desert species, including reptiles, mammals, birds, and insects. The study reveals that many desert animals exhibit nocturnal or crepuscular activity patterns to avoid daytime heat, while others, such as certain reptiles, engage in sun-basking and burrowing to regulate body temperature. Water conservation behaviors, such as metabolic water production, reduced excretion, and moisture absorption from food, are common among desert-dwelling species. Furthermore, opportunistic feeding habits and seasonal dietary shifts play a crucial role in maximizing resource utilization in nutrient-scarce environments. Social behaviors, such as cooperative burrowing and group foraging, have also been observed as survival strategies in some desert species. Additionally, predator-prey interactions in desert ecosystems have led to unique escape responses and camouflage techniques that enhance survival. The study also highlights the impact of climate change on desert biodiversity, emphasizing the need for conservation efforts to protect these highly specialized species. Understanding the behavioral adaptations of desert fauna provides valuable insights into ecological resilience and evolutionary processes. This research contributes to the broader field of behavioral ecology and underscores the significance of preserving fragile desert ecosystems. Future studies incorporating advanced tracking technologies and physiological analyses will further enhance our knowledge of how desert species adapt to changing climatic conditions.

ASSESSING THE INFLUENCE OF FII FROM CHINA, UK AND USA ON VOLATILITY SPILLOVER EFFECTS IN THE INDIAN STOCK MARKET

Anil Kumar. M
Research Scholar, KUFOS& Assistant Professor, GHRU, Amravati
Dr. Suraj E.S
Associate Professor, KCT Business School, Coimbatore
Sivahaami. V
Student, MBA, KCT Business School, Coimbatore

Foreign Institutional Investments (FII) significantly influence stock market volatility, especially in emerging economies like India. This study examines the impact of FII inflows and outflows from the USA, UK, and China on the volatility of Nifty 50 and Sensex, highlighting spillover effects in a globalized financial market.Using quantitative tools such as the Volatility Spillover Index, Correlation Analysis, and Granger Causality Test, the research finds that FII from the USA and China strongly impact Indian market volatility, whereas UK FII has a weaker influence. The results indicate that Nifty 50 and Sensex receive significant volatility from FIIs, reinforcing their dependence on global investment flows.Relying on secondary data sources like financial reports and stock market indices, the study underscores the interconnected nature of financial markets. The findings emphasize the need for investors and policymakers to closely monitor US and Chinese FII trends to better anticipate capital inflows, volatility risks, and market fluctuations. This research offers valuable insights for portfolio managers and risk analysts in developing strategies for managing financial volatility in an evolving investment landscape.

MARKETING AND ADVERTISEMENT STRATEGIES FOR WOMEN CONSUMERS

Amrita Chandra
Research Scholar, Commerce Department, Magadh University, Bodh, Gaya, Bihar

Women consumers form a significant segment of the market, influencing purchasing decisions across various industries. Understanding their preferences, behaviors, and expectations is crucial for businesses to develop effective marketing and advertisement strategies. This paper explores the key strategies that brands can adopt to attract and retain women consumers. Emotional appeal, personalized marketing, digital engagement, and ethical branding play a crucial role in shaping their purchasing decisions. Additionally, social media platforms, influencer collaborations, and cause-driven marketing have emerged as powerful tools to connect with female

audiences. The study also highlights the importance of gender-sensitive advertising that avoids stereotypes and promotes inclusivity. Companies that embrace authenticity, transparency, and social responsibility tend to build stronger brand loyalty among women consumers. By leveraging data-driven insights and adopting a customer-centric approach, businesses can enhance their market presence and drive long-term growth in the competitive landscape.

AI-DRIVEN VIDEO ANALYTICS FOR ENVIRONMENTAL SUSTAINABILITY IN INDIAN OIL AND GAS COMPANIES

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The Oil and Gas industry is a critical pillar of India's energy infrastructure, as it faces increasing pressure to align with global sustainability mandates, carbon reduction targets, and Environmental, Social, and Governance (ESG) principles. While AI-driven technologies are widely acknowledged for their transformative impact on operational efficiency, limited research exists on their direct role in sustainability, particularly in AI-driven Video Analytics for emissions monitoring, predictive maintenance, and safety compliance at fuel retail outlets and refinery operations.

Objective: This study investigates how AI-driven video analytics contributes to environmental sustainability in Indian oil and gas companies, focusing on carbon emission reduction, energy efficiency, and compliance automation. It aims to assess investment trends in AI technologies by major public-sector oil companies (IOCL, BPCL, HPCL) and evaluate their impact on sustainability performance.

Methodology: A qualitative content analysis was conducted on sustainability reports (2021–2023) from India's top oil and gas companies. The study applies an inductive-abductive analytical approach to identify patterns in AI adoption, investments, and their direct and indirect impact on sustainability metrics.

Results: Findings indicate that AI-driven video analytics contributes to sustainability through indirect efficiency improvements rather than direct emission reductions. AI-enabled systems improve fuel station operations, reduce vehicle idling, detect fuel spills, optimize energy usage, and enhance regulatory compliance. However, direct causality between AI adoption and emission reductions remains difficult to quantify.

Conclusion: AI-driven video analytics plays a critical role in enabling operational efficiency and environmental compliance, but its direct impact on carbon

footprint reduction requires further empirical validation. Future research should focus on developing quantitative models to measure AI's impact, exploring AI-driven sustainability frameworks, and assessing long-term benefits of AI adoption in industrial sustainability.

ENSURING SAFE MOTHERHOOD: ASSESSING THE KNOWLEDGE AND PRACTICES OF BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONGST THE PREGNANT WOMEN IN LAKHIPURAURBAN SLUM AREA IN MEERUT CITY, UTTAR PRADESH

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Background: Every pregnancy is a joyful journey for all the women who dream of a safe pregnancy and a healthy baby. However, every pregnant woman faces the risk of sudden, unpredictable maternal complications that could result in injury or death of the infant or the women herself. (Acharya, A. S., Kaur, R., Prasuna, J. G., & Rasheed, N., 2015).Birth Preparedness and Complication Readiness (BPCR) is a critical strategy to reduce maternal and neonatal morbidity and mortality. This study intends to examine the awareness, knowledge, and practices of BPCR amongstthe pregnant women. Birth preparedness and complication readiness is a strategy that encourages pregnant women, their families, and communities to effectively plan for births and deal with emergencies, if they occur.

Objectives:

- To understand the awareness, knowledge and practices for Birth Preparedness and Complication Readiness.
- To study the reasons for their attitude and reluctance to avail the healthcare facilities for institutional deliveries and suggest interventions for improvement.

Method: A cross-sectional exploratory study was conducted amongst the pregnantwomenin Lakhipura which is an urban slum area in Meerut city in Uttar Pradesh to gain insight into the domain of the above research area and the respondent perspective. Both qualitative and quantitative approaches were used.**(**Chawla, D., & Sodhi, N.Research methodology: Concepts and cases2nd ed.)The study assessed the knowledge and practices of Birth Preparedness and Complication Readinessamongst the pregnant women. A total number of 30 pregnant marriedwomenwho actively came forward to participate were interviewed in the month of March and April in the year 2024. The key components on which the assessment was done were, identifying a place for institutional delivery, identifying a skilled birth attendant, arranging for transportation for delivery, saving money for delivery expenses, and early recognition of the danger signs during pregnancy (Agarwal, S., Sethi, V., Srivastava, K., Jha, P. K., & Baqui, A. H. (n.d.). Birth preparedness and complication readiness amongst slum women in Indore City, India, 2010). All the points were given a score of 1 if the answer was “Yes” and zero score was given if the answer was “No”.The BPCR score for each pregnant woman was given out of 5 and the total cumulative BPCR score for all the 30 pregnant women interviewed was given out of 150.

Results: The findings indicate that the awareness and practical readiness of BPCR is relatively low. The rate of Antenatal Checkups (ANCs), institutional deliveries is very poor. Out of 30 pregnant women interviewed not a single women had attended any ANCs. Preference was given to home deliveries by traditional and experienced home birth attendants(local Dai’s) in the local community. Only 6 of the pregnant women had previously delivered at a health care facility and that to when the home birth attendant couldn’t make them deliver at home. Place of delivery was identified only by 4 women; these were the ones who had previously delivered at the healthcare facilities and knew the hospitals where they could go in case of any emergency at home. The awareness about components of BPCR was poor. There was not a single pregnant woman who knew about the identification of a skilled birth attendant, arrangement for transportation for delivery, saving money for delivery expenses. There were only 4 pregnant women who knew about more than 3 danger signs during pregnancy. The BPCR Score was 8 out of 150 for the sample interviewed. During the interview it was also observed that there is a reluctance to go to healthcare facilities for delivery by the pregnant women. The reason quoted by the pregnant women for the same was that there is lack of privacy at the healthcare facilities and the infrastructure is also inadequate. During the study, it was also observed that there is also a lack of compliance for preparedness for any emergency which is leading to

high morbidity and mortality (birth history cases in their extended families). Also the choice for delivery by the local community is private healthcare facilities as they assume that quality of care provided at the government facilities is poor. This assumption is leading to high out of pocket expenditure.

Conclusion: The study highlights the need for enhanced health education, community engagement, and policy interventions to improve maternal and newborn health outcomes. There is a need to understand the internal factors (lack of education, religious beliefs, family tradition and pressure from elders etc.) and external factors (increasedfootfall and lack of privacy in public health care facilities and increased expenses and lack of trust in private healthcare facilities) which act as barriers and challenges to hinder the institutional deliveries. There is a need for strengthening antenatal education and community-based interventions in focus groups through a collective approach by the ASHA (Accredited Social Health Activist), Anganwadi workers, traditional birth attendants, families, community heads which can enhance BPCR practices, ultimately improving maternal and newborn health outcomes.

MICROFINANCE INSTITUTIONS AND INCLUSIVE GROWTH

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Microfinance institutions (MFIs) play a critical role in fostering inclusive growth by offering financial services to marginalized communities, particularly in rural and remote areas. This paper investigates the impact of microfinance on small businesses, entrepreneurship, and economic development in North Bihar, a region characterized by financial exclusion and economic challenges. Using primary survey data and secondary sources, this study evaluates the effectiveness of microfinance in improving livelihoods, financial literacy, and socio-economic mobility. The findings reveal that microfinance contributes significantly to income generation, employment creation, and women's empowerment. However, challenges such as high interest rates, repayment defaults, and regulatory constraints hinder its full potential. The paper concludes with recommendations for enhancing microfinance efficiency through policy reforms, digital technology integration, and financial literacy programs.

PROSPECTS OF ADVENTURE TOURISM IN SELECTED REGIONS OF ASSAM IN A SUSTAINABLE & ECOLOGICAL WAY

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Adventure tourism is a rapidly growing sector within the global tourism industry, offering immersive experiences while contributing to local economies. Assam, with its diverse landscapes, rich biodiversity, and cultural heritage, holds significant potential for adventure tourism development. This study explores the prospects of adventure tourism in selected regions of Assam, emphasizing sustainable and ecological approaches. It investigates how responsible adventure tourism can drive economic growth while ensuring environmental conservation and cultural preservation. Through secondary data analysis, this study examines key areas such as policy frameworks, infrastructure development, community participation, and environmental sustainability. The findings suggest that sustainable adventure tourism can generate employment opportunities, support community-based tourism, and contribute to regional socio-economic development. However, challenges such as inadequate infrastructure, lack of awareness, and environmental degradation pose significant barriers to sustainability. The study recommends implementing best practices in sustainable tourism, including eco-tourism certifications, low-impact adventure activities, and community-driven tourism models. Integrating conservation strategies with adventure tourism initiatives can help maintain ecological balance while enhancing visitor experiences. By aligning adventure tourism with sustainability goals, Assam can establish itself as a premier destination for eco-friendly adventure tourism in India. This research provides valuable insights for policymakers, tourism planners, and stakeholders to develop a responsible adventure tourism framework that benefits both local communities and the environment.

CURRENT TRENDS IN PLANT BREEDING: INNOVATIONS, CHALLENGES, AND FUTURE PROSPECTS

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Plant breeding has undergone significant advancements in recent years, driven by innovations in biotechnology, genomics, and precision agriculture. Traditional breeding methods such as hybridization and selection have been enhanced by modern techniques, leading to improved crop yields, disease resistance, and environmental sustainability. This paper explores the current trends in plant

breeding, emphasizing the role of molecular breeding, genome editing technologies, and bioinformatics in accelerating crop improvement. One of the most notable advancements in plant breeding is the integration of molecular markers and marker-assisted selection (MAS). These tools allow breeders to identify desirable traits at the genetic level, reducing the time required for crop improvement. Additionally, genomic selection (GS) has emerged as a powerful approach, enabling more accurate predictions of complex traits based on whole-genome information. Another revolutionary development is genome editing, particularly with the CRISPR-Cas9 system, which has enabled precise modifications in plant genomes. This technology has been instrumental in developing crops with enhanced nutritional content, improved stress tolerance, and resistance to pests and diseases. Furthermore, the advent of gene stacking and synthetic biology has opened new possibilities for designing crops with multiple desirable traits. The role of biotechnology in plant breeding is further enhanced by advancements in tissue culture and genetic transformation techniques. These methods facilitate the rapid propagation of elite plant varieties and the introduction of novel traits. Climate change and food security concerns have also influenced recent trends in plant breeding. Breeding programs now focus on developing climate-resilient crops that can withstand extreme weather conditions, water scarcity, and soil degradation. In conclusion, plant breeding is experiencing a paradigm shift with the incorporation of cutting-edge biotechnological and computational tools. These advancements hold immense potential for ensuring global food security and environmental sustainability. However, regulatory frameworks, ethical considerations, and public acceptance of genetically modified and gene-edited crops remain critical challenges. Future research should aim at harmonizing technological progress with sustainable agricultural practices to meet the demands of a growing population.

THE POWER OF ALGAE: THE FUTURE OF SUSTAINABLE BIOFUEL

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The global energy crisis and the urgent need for sustainable alternatives to fossil fuels have intensified research into biofuels. Among various biofuel sources, algae have emerged as a promising candidate due to their rapid growth, high lipid content, and ability to thrive in diverse environments. This paper explores the potential of algae as the future of sustainable biofuel, highlighting their advantages, production methods, and economic feasibility. Algae-based biofuels offer a significant advantage

over conventional biofuels derived from crops like corn and sugarcane, as they do not compete with food production or require large amounts of arable land. Algae can be cultivated in non-arable lands, wastewater, and even in saline environments, making them highly adaptable. Furthermore, algae have a higher photosynthetic efficiency and biomass yield per unit area compared to terrestrial crops, enabling greater biofuel production in a shorter time. This study reviews the key methods for algae-based biofuel production, including direct lipid extraction for biodiesel, thermochemical conversion for bio-oil, and biochemical processes for bioethanol and biogas generation. The paper also discusses recent advancements in genetic engineering and bioreactor technologies that enhance lipid accumulation and overall biofuel yield. Despite these advantages, challenges such as high production costs, energy-intensive harvesting, and scalability issues remain obstacles to commercializing algae-based biofuels. However, integrated biorefinery approaches and advancements in biotechnological interventions offer promising solutions to improve economic viability. Additionally, the study examines the environmental impact of algae biofuel production, emphasizing its role in reducing greenhouse gas emissions, mitigating climate change, and utilizing carbon sequestration. Algae cultivation can also support wastewater treatment and bioremediation, adding further environmental benefits. In conclusion, algae-based biofuels represent a sustainable and eco-friendly alternative to conventional fossil fuels. While challenges persist, ongoing research, policy support, and investment in biotechnological advancements can unlock the full potential of algae as a renewable energy source. This paper underscores the necessity of interdisciplinary efforts to overcome current limitations and make algae-based biofuels a viable and scalable solution for future energy demands.

THE BHAKTI AND SUFI MOVEMENTS: THEIR IMPACT ON INDIAN SOCIETY, CULTURE, AND RELIGIOUS PLURALISM

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The Bhakti and Sufi movements played a transformative role in shaping Indian society and culture from the medieval period onwards. These spiritual and socio-religious movements emerged as a response to rigid caste hierarchies, ritualistic orthodoxy, and growing divisions within society. The Bhakti movement, rooted in devotional Hindu traditions, emphasized personal devotion (bhakti) to a deity, transcending caste and gender barriers. Saints like Kabir, Mirabai, Tulsidas, and Guru Nanak spread messages of equality, love, and devotion through vernacular poetry

and songs, fostering social harmony and bridging communal divides. Simultaneously, the Sufi movement, an Islamic mystical tradition, flourished in India with the arrival of Sufi saints such as Khwaja Moinuddin Chishti, Nizamuddin Auliya, and Baba Farid. Sufism emphasized inner spirituality (tasawwuf), universal brotherhood, and love for humanity, promoting interfaith dialogue and cultural exchange between Hindus and Muslims. Sufi saints established khanqahs (hospices) that served as centers of learning and humanitarian service, thereby influencing social structures and encouraging a syncretic cultural ethos. The Bhakti and Sufi movements significantly impacted Indian society by challenging orthodox religious practices, advocating for social inclusivity, and inspiring cultural and artistic expressions. The devotional poetry of Bhakti saints and the mystical verses of Sufi poets enriched regional languages and literature. Their teachings influenced classical music, dance, and folk traditions, contributing to the rich tapestry of Indian cultural heritage. Furthermore, these movements played a crucial role in promoting communal harmony by fostering a spirit of tolerance and mutual respect among different religious communities. This paper explores the philosophical underpinnings, prominent figures, and socio-cultural impact of the Bhakti and Sufi movements in India. It examines how these movements contributed to religious pluralism, social reform, and the evolution of Indian literature and art. By analyzing historical narratives, literary contributions, and cultural legacies, this study highlights the enduring influence of Bhakti and Sufi traditions in shaping India's diverse and inclusive society.

BEYOND ALGORITHMS: A G.E.N.D.E.R. AI FRAMEWORK FOR ADVANCING WORKPLACE EQUITY IN AUTOMATION

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Background: Artificial intelligence (AI) and automation are increasingly influencing workplace decision-making, particularly in recruitment, performance evaluations, and career progression. While AI is often perceived as neutral, research highlights that these systems frequently replicate and amplify historical gender biases, disproportionately disadvantaging women and marginalized groups. Existing AI fairness models primarily focus on generic algorithmic bias but fail to address gender-specific and intersectional discrimination. Additionally, corporate AI governance frameworks lack structured enforcement mechanisms, leading to reactive rather than proactive bias mitigation.

Objective: This study aims to develop a structured framework for mitigating gender bias in AI-driven workplace automation. It seeks to bridge the gap between AI development and ethical workforce practices by integrating fairness, accountability, and inclusivity into algorithmic decision-making.

Methodology: A conceptual research design is adopted, synthesizing insights from AI fairness literature, gender studies, and corporate governance frameworks. The study relies on secondary data sources, including peer-reviewed journal articles, industry reports, and case studies on AI-driven workplace discrimination. Theoretical models such as Gender Role Theory, Algorithmic Bias Theory, and Intersectionality Theory inform the framework's development.

Proposed Model: The study introduces the G.E.N.D.E.R. AI Framework as a structured approach to mitigating gender bias in AI-driven workplace automation. This framework integrates six core components to ensure fairness, accountability, and inclusivity in algorithmic decision-making. Governance and regulation serve as the foundation, establishing AI fairness policies and ensuring compliance with ethical and legal standards. Equitable data training addresses biases embedded in historical datasets by implementing strategies to eliminate discriminatory patterns and promote balanced representation. Neutrality in algorithm design emphasizes fairness-aware programming and model transparency, ensuring that AI-driven systems do not reinforce systemic inequalities. Diversity in AI development teams plays a crucial role in reducing bias by incorporating inclusive perspectives in the design and deployment of AI technologies. Evaluation and bias audits enable continuous monitoring of AI-driven decisions, facilitating early detection and correction of discriminatory patterns in hiring, performance assessments, and career progression. Lastly, responsible AI usage mandates human oversight in AI-powered employment decisions, ensuring that algorithmic recommendations are critically reviewed and do not replace human judgment in critical workplace determinations. By integrating these principles, the G.E.N.D.E.R. AI Framework provides a comprehensive, interdisciplinary model designed to promote gender-equitable AI governance and ethical automation in workforce management.

Results: The framework provides a structured, interdisciplinary approach to embedding gender equity into AI decision-making. It highlights key challenges in existing AI fairness models and offers actionable solutions for AI developers, HR professionals, and policymakers.

Conclusion: As AI continues to shape workforce dynamics, it is critical to ensure that automation fosters inclusivity rather than reinforcing historical inequalities. The G.E.N.D.E.R. AI Framework serves as a foundation for ethical AI governance,

promoting gender fairness in workplace automation. Future research should focus on empirical validation, industry-specific adaptations, and the integration of explainable AI techniques to enhance fairness in AI-driven employment decisions.

PARADIGM SHIFT IN SUSTAINABILITY: UNRAVELLING THE HUMAN PSYCHE FOR ENVIRONMENTAL STEWARDSHIP

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Background: Traditional sustainability models have focused on technological advancements, economic incentives, and policy regulations to drive environmental responsibility. However, climate change, biodiversity loss, and ecological degradation continue to worsen, highlighting the limitations of policy-driven approaches. Research suggests that human psychology significantly influences sustainability adoption, yet cognitive biases, eco-anxiety, and social influences remain underexplored in environmental policies. A paradigm shift is needed—one that integrates behavioural science, cognitive psychology, and social reinforcement into sustainability frameworks to bridge the gap between awareness and action.

Objective: This study examines the role of human psychology in environmental stewardship and proposes a behaviourally informed sustainability paradigm. It explores cognitive and emotional factors that influence sustainability decision-making, identifies psychological barriers and motivators, and presents evidence-based behavioural interventions to enhance engagement. The study further introduces a human-centered sustainability framework, prioritizing intrinsic motivation, social norms, and behavioural nudging over traditional external enforcement mechanisms.

Methodology: This study employs a traditional literature review approach, synthesizing insights from behavioural science, cognitive psychology, and environmental studies. A qualitative narrative synthesis was conducted, analyzing peer-reviewed literature and theoretical frameworks on cognitive biases, eco-anxiety, and social norm interventions in sustainability behaviour.

Results: Findings reveal that cognitive biases (status quo bias, present bias, optimism bias) create a disconnect between awareness and action, while eco-anxiety can either motivate or discourage engagement. Social norms and peer influence significantly impact sustainability choices, with community-based interventions and behavioural nudging proving more effective than policy enforcement.

Conclusion: The study identifies three key pillars for a behaviourally informed sustainability paradigm: integrating cognitive and emotional insights into policies, leveraging peer influence and community-driven initiatives, and designing behavioural nudges that make sustainability effortless. By embedding psychology into sustainability frameworks, this study provides a comprehensive model for fostering long-term environmental responsibility.

BIOINSPIRED CATALYSTS: ADVANCING EFFICIENT AND SUSTAINABLE ORGANIC TRANSFORMATIONS

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Bioinspired catalysts have emerged as a transformative class of materials for efficient and sustainable organic transformations. Drawing inspiration from natural enzymes, these catalysts mimic biological processes to enhance reaction selectivity, efficiency, and environmental compatibility. This paper provides a comprehensive review of bioinspired catalysts, focusing on their design principles, synthetic strategies, and applications in organic transformations. The development of bioinspired catalysts is primarily based on enzyme mimicry, where structural and functional elements of natural catalysts are replicated using synthetic materials. Metal-organic frameworks (MOFs), biomimetic nanomaterials, and organometallic complexes are key classes of bioinspired catalysts that demonstrate remarkable catalytic efficiency. By incorporating transition metals such as iron, cobalt, and copper, these catalysts achieve high turnover frequencies and regioselectivity in oxidation, reduction, and cross-coupling reactions. Moreover, peptide- and protein-based catalysts, inspired by metalloenzymes, enable highly specific transformations under mild conditions. One of the most promising applications of bioinspired catalysts is in green chemistry, where they facilitate environmentally benign processes by minimizing the use of hazardous reagents and reducing energy consumption. Their role in asymmetric synthesis, CO_2 fixation, and biomass valorization underscores their potential to revolutionize sustainable chemical manufacturing. Additionally, hybrid bioinspired catalysts, integrating biological and synthetic components, have been developed to enhance stability and reusability, addressing the challenges associated with natural enzyme catalysts. Despite their advantages, the practical implementation of bioinspired catalysts faces challenges such as scalability, cost, and structural complexity. Future research should focus on improving catalyst robustness, expanding substrate scope, and developing more efficient synthesis routes. The

integration of computational modeling and artificial intelligence in catalyst design is also expected to accelerate the discovery of next-generation bioinspired catalysts. In conclusion, bioinspired catalysts offer a promising approach to achieving efficient and sustainable organic transformations. Their ability to replicate enzymatic precision while operating under diverse conditions makes them valuable tools in modern synthetic chemistry. Advancements in material science, nanotechnology, and biomolecular engineering will further enhance their applicability, paving the way for innovative and eco-friendly catalytic solutions.

LOCAL SELF-GOVERNANCE AND DEVELOPMENT: THE ROLE OF NON-RESIDENT RAJ

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Local self-governance plays a crucial role in fostering grassroots development, ensuring democratic decentralization, and empowering communities. In India, institutions like Panchayati Raj and urban local bodies have been instrumental in implementing policies, mobilizing resources, and addressing socio-economic challenges at the local level. However, an emerging yet often overlooked factor influencing local governance and development is the contribution of Non-Resident Raj (NRR)—migrants and diaspora individuals who maintain strong socio-economic and cultural ties with their native places. This paper explores the role of the Non-Resident Raj in strengthening local self-governance and fostering development in their home regions. It examines how financial remittances, knowledge transfer, technological interventions, and philanthropic activities initiated by migrants contribute to local governance structures. The study also highlights the socio-political engagement of NRR in decision-making processes, electoral participation, and community development projects. By analyzing case studies from various Indian states, the research underscores how Non-Resident Raj members facilitate rural infrastructure development, education, healthcare, and entrepreneurial initiatives, thereby complementing government efforts. Despite these positive contributions, several challenges hinder the effective integration of NRR in local self-governance. Issues such as bureaucratic red tape, lack of formal institutional mechanisms for engagement, and political resistance often limit their potential impact. Additionally, disparities in policy frameworks across states create inconsistencies in leveraging migrant contributions effectively. The paper suggests policy recommendations for

institutionalizing NRR participation in local governance, including formal recognition of their role, streamlined investment procedures, and the establishment of local governance-NRR coordination mechanisms. By examining the intersection of migration, governance, and development, this research contributes to a broader understanding of how Non-Resident Raj can serve as a vital stakeholder in local self-governance. The study argues that a systematic approach to engaging the migrant population can lead to sustainable development and democratic strengthening at the grassroots level. Ultimately, recognizing and harnessing the potential of NRR can enhance the effectiveness of local governance, drive economic progress, and ensure inclusive growth in India's rural and urban landscapes.

IMPACT OF CLIMATE CHANGE ON DESERTIFICATION: A CASE STUDY OF RAJASTHAN

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Climate change has emerged as a critical global challenge, with its effects being profoundly visible in arid and semi-arid regions. Rajasthan, the largest state of India, is particularly vulnerable to desertification due to its geographical location, climatic conditions, and anthropogenic pressures. This study explores the impact of climate change on desertification in Rajasthan, analyzing key environmental parameters such as temperature rise, decreasing precipitation, soil degradation, and shifting land use patterns. The study employs a combination of meteorological data analysis, remote sensing techniques, and field observations to assess the extent of desertification in the state. Historical temperature and rainfall trends indicate a significant increase in aridity over the past few decades, exacerbating soil erosion, loss of vegetation cover, and declining groundwater levels. Additionally, the overexploitation of natural resources, unsustainable agricultural practices, and deforestation have accelerated land degradation, further intensifying desertification risks. Our findings highlight that regions such as the Thar Desert and its adjoining districts are experiencing rapid desertification, leading to reduced agricultural productivity, biodiversity loss, and socio-economic challenges for local communities. Climate-induced changes, coupled with human activities, have increased the frequency of dust storms, droughts, and water scarcity, posing a severe threat to sustainable development in the region. The paper also examines various mitigation and adaptation strategies to combat desertification in Rajasthan. These include afforestation programs, water conservation techniques, sustainable land management

practices, and the promotion of climate-resilient agriculture. The role of government policies, community participation, and technological interventions is emphasized to curb the adverse effects of desertification and enhance environmental sustainability. In conclusion, this study underscores the urgent need for integrated efforts to address the growing impact of climate change on desertification in Rajasthan. A multi-pronged approach involving scientific research, policy implementation, and community engagement is essential to mitigate land degradation and ensure the long-term sustainability of the region's fragile ecosystem. This research contributes to the broader discourse on climate change and desertification, offering insights that can inform regional and national strategies for environmental conservation.

IMPACT OF CLIMATE CHANGE ON AQUATIC ECOSYSTEMS AND FISH DIVERSITY

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Climate change is significantly altering aquatic ecosystems worldwide, affecting water temperature, hydrological cycles, and habitat stability. These changes pose severe threats to fish diversity, disrupting species distribution, reproduction, and survival. This study examines the impact of climate change on aquatic ecosystems and its consequences for fish populations, focusing on temperature fluctuations, ocean acidification, altered precipitation patterns, and habitat degradation. Through a comprehensive review of existing literature and case studies, this research highlights how rising water temperatures affect fish metabolism, migration patterns, and breeding cycles. Many species are forced to shift their habitats, leading to biodiversity loss and increased competition among native and invasive species. Additionally, ocean acidification caused by elevated CO_2 levels weakens the calcium carbonate structures of marine organisms, indirectly impacting fish populations dependent on coral reefs and shellfish. Changes in precipitation patterns and extreme weather events, such as floods and droughts, further disrupt freshwater ecosystems, reducing oxygen levels and altering food availability for aquatic species. Human-induced factors, including pollution, overfishing, and habitat destruction, exacerbate the vulnerability of fish populations to climate change. This paper also explores the socio-economic implications of declining fish diversity, particularly for communities reliant on fisheries for food security and livelihoods. Sustainable management strategies, such as the establishment of marine protected areas, habitat restoration, and climate-resilient aquaculture practices, are discussed as potential solutions to mitigate the

adverse effects of climate change on aquatic biodiversity. Furthermore, the study emphasizes the importance of international collaborations, policy interventions, and advanced research techniques, such as remote sensing and genetic studies, in monitoring and conserving fish populations. Addressing climate change impacts on aquatic ecosystems requires a multidisciplinary approach that integrates ecological, economic, and policy-driven solutions. This research concludes that immediate conservation efforts, along with adaptive strategies, are essential to protect aquatic biodiversity and ensure the long-term sustainability of fish populations in a rapidly changing climate.

THERMODYNAMIC AND KINETIC ASPECTS OF POLYMER DEGRADATION UNDER ENVIRONMENTAL CONDITIONS: MECHANISMS, MODELING, AND SUSTAINABILITY IMPLICATIONS

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Polymer degradation under environmental conditions is a critical issue affecting material performance, waste management, and ecological sustainability. This study examines the thermodynamic and kinetic aspects of polymer degradation, focusing on the role of environmental factors such as temperature, humidity, UV radiation, and microbial activity. The degradation mechanisms of various polymers, including thermoplastics, thermosets, and biodegradable polymers, are analyzed using thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), and Fourier-transform infrared spectroscopy (FTIR). From a thermodynamic perspective, the study evaluates Gibbs free energy (ΔG), enthalpy (ΔH), and entropy (ΔS) changes during polymer degradation, providing insights into the spontaneity and stability of the degradation process. The findings indicate that oxidative and hydrolytic degradation pathways significantly influence the thermodynamic parameters, leading to variations in degradation rates across different polymer types. The kinetic study involves determining the activation energy (Ea) and reaction order using models such as the Arrhenius equation, Coats-Redfern method, and Flynn-Wall-Ozawa approach. The results highlight that polymer degradation follows different kinetic models depending on the environmental conditions and polymer structure. In particular, UV-induced photodegradation exhibits lower activation energy compared to thermal degradation, indicating a faster degradation rate under prolonged sunlight exposure. Additionally, the influence of catalysts, plasticizers, and additives on polymer degradation kinetics is explored, revealing that certain stabilizers can extend polymer lifespan, whereas

environmental pollutants can accelerate degradation. The study also discusses the implications of polymer degradation on microplastic formation and long-term environmental sustainability. Overall, this research provides a comprehensive thermodynamic and kinetic framework for understanding polymer degradation under real-world conditions. The findings contribute to the development of more durable, recyclable, and biodegradable polymers, aiding in sustainable material design and waste management strategies.

EXPOSURE OF COMMUTERS TO PARTICULATE MATTER FOR VARIOUS MODES OF COMMUTING IN DELHI – NATIONAL CAPITAL REGION (NCR)

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In India, traffic is the main cause of air pollution in urban areas. While commuting, commuters are substantially exposed to pollutants. This study was carried out on one of the busiest routes of Delhi – NCR to measure personal exposure to PM_1, $PM_{2.5}$, and PM_{10} in four transportation modes, such as motorcycle, auto–rickshaw, car–open window, and car–AC (Air conditioner). Using a transportable aerosol spectrometer, Particulate Matter (PM) measurements were repeated for five weekdays during peak and off-peak hours for all transportation modes. Trip averaged exposure to pollution to commuters for PM_1 in decreasing order was motorcycle, auto rickshaw, car – open window and car - AC in peak hour and motorcycle, auto rickshaw, car –open window and car – AC in non–peak hour. For $PM_{2.5}$ it was motorcycle, auto rickshaw, car – open window and car - AC in peak hour and motorcycle, auto rickshaw, car – open window and car – AC in non–peak hour. Whereas for PM_{10} it was motorcycle, auto rickshaw, car – open window and car - AC in peak hour and motorcycle, auto rickshaw, car – open window and car – AC in non–peak hour. Size fractions (fine/coarse) varied from 32 to 78% in the peak hour and 24 to 60% in the non–peak hour.The findings of this study can be utilized to focus efforts on lowering personal exposure.

SPATIAL ANALYSIS OF ELECTORAL TURNOUT PATTERNS IN RAJASTHAN: A GEOGRAPHICAL PERSPECTIVE

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This study investigates the spatial patterns of electoral turnout in Rajasthan, emphasizing the role of geographical factors in shaping voter behaviour. By analysingparliamentary constituency election data of 2024, the research explores how diverse physical, socio-economic, and infrastructural elements have influenced voter turnout across Rajasthan's regions. Using GIS-based maps and statistical conclusions, the study identifies regional clusters of voter behaviour and reveals key factors contributing to turnout disparities. The findings aim to provide an insight to policymakers and election authorities for improved voter mobilization strategies in geographically disadvantaged and advantaged regions.

LIFE IN KITTUR OF BETWEEN THE ASSASSINATIONS OF ARAVIND ADIGA

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Between The Assassinations (2008) is the book, a collection of short stories by the Booker Prize Winner Aravind Adiga. The title of the book refers to the period between the assassination of Prime Minister Indira Gandhi in 1984 and the 1991 assassination of Rajiv Gandhi who had also served as Prime Minister and was running for parliament at the time of his murder. The stories in *Between The Assassinations* have a backup of rural, coastal south Kittur (fictional), India where it is set. Adiga is not the first writer to write about a fictional created by his own. We have Charles Dickens who has created Coke Town, Thomas Hardy who's fictional town is Wessex. This is about some of the British literature novelists. R.K.Narayan of Indian English literature has also created a fictional town Malgudi. In these novels the writers

speak about the then condition of their respective countries and native places. Following that lineage Adiga has also created a fictional town named Kittur, a fictional town somewhere in South India. Its subject is the pathos, injustice, corruption and ironies of India life. The lives that Adiga is interested in exploring here are; a young Muslim who is sent away by his parents to earn a job in town conscripted to help a terrorist plan in the railway station, a dalit book seller who is arrested for selling a copy of the banned*Satanic Verses*, a rich spoiled, half-caste student who decides to explode a bomb in a college. These are some characters from the collection of short stories, *Between The Assassinations.* They speak of the condition of India during the murders of Indira Gandhi and Rajiv Gandhi.

BIODIVERSITY AND CONSERVATION STRATEGIES OF ENDANGERED FAUNA: A CASE STUDY

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Biodiversity plays a crucial role in maintaining ecological balance and supporting life on Earth. However, rapid urbanization, deforestation, climate change, and human activities have led to a significant decline in wildlife populations, pushing many species toward extinction. This study focuses on the biodiversity status and conservation strategies for endangered fauna, with a special emphasis on a selected case study region. The research assesses species diversity, habitat loss, and the primary threats faced by endangered species in the study area. Data collection was conducted through field surveys, literature reviews, and interviews with local conservationists and researchers. The findings highlight critical factors contributing to species decline, including habitat fragmentation, poaching, pollution, and invasive species. Moreover, the study evaluates the effectiveness of existing conservation policies and initiatives, such as wildlife sanctuaries, national parks, community-based conservation programs, and legal frameworks. The role of ex-situ conservation methods, such as captive breeding and species reintroduction, is also examined as a potential measure to revive declining populations. Furthermore, this paper emphasizes the importance of integrating scientific research with community participation to ensure sustainable conservation efforts. Public awareness campaigns, eco-tourism, and government policies play a vital role in promoting conservation and reducing human-wildlife conflict. Advanced technologies such as remote sensing, GIS mapping, and genetic studies have proven to be valuable tools in monitoring and managing endangered species. This case study serves as a model for biodiversity

conservation by identifying challenges and proposing effective, evidence-based strategies to protect threatened species. The research concludes that a multidisciplinary approach combining ecological research, government support, and local community engagement is essential for ensuring the long-term survival of endangered fauna. Strengthening conservation policies and international collaborations will be key to safeguarding biodiversity for future generations.

ECONOMIC EMPOWERMENT THROUGH HERITAGE TOURISM: TRANSFORMING WOMEN'S LIVES IN HIMACHAL PRADESH

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Heritage tourism has emerged as a key driver of **economic empowerment**for women in **Himachal Pradesh**, a region renowned for its rich cultural heritage and traditional practices. This study examines the**transformative role of heritage tourism**in improving women's socio-economic conditions by providing**income-generating opportunities, promotion entrepreneurship, and preserving indigenous cultural traditions**. Women play a vital role in various tourism-related sectors, such as **handicrafts, traditional fabric production, local cuisine, folk performances, eco-tourism, and home stay hospitality**, contributing not only to their financial autonomy but also to **cultural sustainability**and the overall growth of their communities.Despite the rising opportunities, women's contribution in the**heritage tourism sector**remains limited due to**various socio-economic barriers**. These challenges take in**restricted access to financial resources, lack of formal training, gender-based social constraints, seasonal fluctuations in tourism, and insufficient marketing exposure**. This research, through**empirical analysis**, identifies these barriers while also highlighting**success stories**of women-led tourism enterprises that have effectively leveraged heritage tourism for economic growth. The study emphasizesthat **community-based tourism models**, **government schemes**, and **skill growth programs**can appreciablyimprove women's access to the economic benefits of tourism. By adopting**gender-inclusive policies, financial support mechanisms, and digital marketing strategies**, women can gain greater visibility in the tourism industry, thusincrease their economic safety. As well,**public-private partnerships, tourism cooperatives, and self-help groups**can further help in promoting women's entrepreneurship in heritage tourism.The findings of this study

suggest that**sustainable and inclusive tourism development**can lead to a significant improvement in women's socio-economic circumstances while ensuring the**preservation of Himachal Pradesh's cultural heritage**. By creating an enabling environment through **policy interventions, education, and financial accessibility**, heritage tourism can become a powerful tool for**women's empowerment and long-term economic flexibility**. This research advocates for a**multi-stakeholder approach**, connecting**government agencies, tourism boards, NGOs, and local communities**, to ensure that women in Himachal Pradesh can fully harness the potential of**heritage tourism**as a sustainable employment option.

A STUDY ON EMOTIONAL INTELLIGENCE AMONG THE EMPLOYEES OF BANKING SECTOR WITH SPECIAL REFERENCE TO KANNUR DISTRICT

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The Indian banking system face a lot of challenges such as community oriented banking and transforming a traditional culture that typically emphasized operational efficiencies to promote team collaboration, innovation, qualitative and effective process. Therefore, it becomes very important that banks should focus on high quality services. Service quality is conforming to the customer requirements and expectations. Customer satisfaction results when expectations are met. There are various human factors which are responsible for high service quality. Emotional intelligence is one of such factors. In this contemporary world, banks in India have started paying consideration for enhancing service quality because of intense competition. These days, effective and qualitative performances in service occupations like banking, are not at all about ability, but involve emotions and behaviour. So, this is to investigate the emotional intelligence of employees of banking sector in Kannur District and how it will affect their performance. The main objective of the study is to find out the level of emotional intelligence of employees, to know how emotional intelligence affect the work performance of employees and to suggest necessary guidelines to improve the emotional intelligence of bank employees.The study is descriptive and analytical in nature. A sample of the 100 employees who carrying out clerical and administrative work of various branches of Public sector banks in Kannur District are selected through convenience sampling method. The primary data are analysed and interpreted with the help of tables and graph and other statistical tools like percentage analysis, Chi Square test and Weighted Average

Mean. The study can be concluded with the main findings that the Emotional Intelligence of employees of banking sector are moderate level.

ROLE OF CARBON FOOTPRINT IN SUSTAINABLE DEVELOPMENT

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Sustainable development seeks to balance present economic, social, and environmental needs without compromising the well-being of future generations. A crucial aspect of this goal is managing and reducing the carbon footprint, which encompasses total greenhouse gas emissions resulting from human activities. Addressing carbon footprint reduction is essential for mitigating climate change, conserving natural resources, and ensuring environmental resilience. This paper examines the role of carbon footprint management in sustainable development, focusing on key strategies such as adopting low-carbon technologies, enhancing energy efficiency, and transitioning to renewable energy sources. Additionally, the study explores the impact of carbon offset programs, sustainable lifestyle choices, and corporate responsibility in minimizing carbon emissions. The role of effective policies, international cooperation, and industry-led initiatives is also discussed as pivotal drivers of a low-carbon economy. By analyzing case studies and linking carbon footprint reduction to Sustainable Development Goals (SDGs), this research highlights the necessity of a holistic approach that integrates economic progress, social equity, and environmental sustainability. The findings emphasize that collaborative efforts among governments, industries, and individuals are imperative to achieving long-term sustainability.

ADVANCEMENTS AND APPLICATIONS OF MICROBIOLOGY IN MODERN SCIENCE

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Microbiology is a rapidly evolving field that has significantly contributed to various scientific and industrial advancements. This paper explores the fundamental principles of microbiology, its recent developments, and its diverse applications in medicine, agriculture, environmental sustainability, and biotechnology. The study of

microorganisms, including bacteria, viruses, fungi, and protozoa, has led to groundbreaking discoveries in disease prevention, vaccine development, and antibiotic resistance mechanisms. With the advent of molecular biology techniques, metagenomics, and bioinformatics, microbiology has expanded into fields like synthetic biology and genetic engineering, enabling innovations such as recombinant DNA technology, CRISPR-Cas9 gene editing, and microbial biofactories for pharmaceutical production. Moreover, the role of microbiomes in human health, particularly in the gut and skin, has gained significant attention, influencing probiotic therapies and personalized medicine. In agriculture, microbiology has revolutionized sustainable farming practices by enhancing soil fertility through nitrogen-fixing bacteria, biopesticides, and microbial inoculants. Additionally, microbial biotechnology plays a crucial role in biofuel production, wastewater treatment, and bioremediation of pollutants, contributing to environmental conservation and renewable energy solutions. This paper also discusses the challenges associated with microbiology, including the emergence of multidrug-resistant pathogens, biosecurity concerns, and ethical considerations in genetic manipulations. Future research in microbiology is expected to focus on artificial intelligence-driven microbial diagnostics, microbiome engineering, and novel antimicrobial strategies to combat infectious diseases. By integrating microbiology with interdisciplinary sciences, researchers can develop innovative solutions to global health, food security, and environmental challenges. This paper highlights the transformative potential of microbiology and its indispensable role in shaping the future of science and technology.

DEVELOPMENT OF BIODEGRADABLE POLYMERS FOR SUSTAINABLE PACKAGING SOLUTIONS

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The growing environmental concerns over plastic pollution have driven significant research into sustainable alternatives, particularly biodegradable polymers for packaging applications. Conventional petroleum-based plastics pose serious ecological threats due to their persistence in the environment. In response, biodegradable polymers have emerged as a promising solution to mitigate plastic waste and promote sustainability. This paper explores the development, properties, and applications of biodegradable polymers in sustainable packaging solutions. The study delves into various biodegradable polymer classes, including polylactic acid (PLA), polyhydroxyalkanoates (PHA), polybutylene succinate (PBS), and starch-

based bioplastics. These materials offer desirable properties such as biodegradability, compostability, and lower carbon footprints compared to conventional plastics. The paper evaluates their mechanical, thermal, and barrier properties, highlighting advancements in polymer blending, reinforcement, and surface modifications to enhance their performance. Key challenges associated with biodegradable polymers, including high production costs, limited industrial scalability, and performance limitations under specific environmental conditions, are discussed. Strategies such as nanocomposite incorporation, bio-based plasticizers, and improved polymer processing techniques are analyzed to enhance material efficiency and cost-effectiveness. Furthermore, the paper reviews the role of regulatory frameworks, policies, and global initiatives in fostering the adoption of biodegradable packaging. A comprehensive life cycle assessment (LCA) of biodegradable polymers is conducted to compare their environmental impacts with conventional plastics, emphasizing factors such as biodegradation rates, recyclability, and overall sustainability. The potential integration of bio-based feedstocks and circular economy models in the packaging industry is also explored to ensure a holistic approach to sustainable development. In conclusion, biodegradable polymers represent a viable alternative to traditional plastics, offering eco-friendly packaging solutions with reduced environmental impact. Continued advancements in material science, innovative manufacturing techniques, and supportive policies are essential to overcoming current limitations and achieving large-scale implementation. This study underscores the importance of interdisciplinary collaboration in driving the transition towards a more sustainable and circular packaging economy.

SOCIAL AND EMOTIONAL TEACHING AND LEARNING

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Social and emotional teaching and learning (SETL) has emerged as a crucial aspect of modern education, addressing students' holistic development beyond academic achievements. In an era marked by rapid technological advancements and social complexities, fostering emotional intelligence, resilience, and interpersonal skills is essential for students' overall well-being and success. This paper explores the significance of integrating social and emotional learning (SEL) into educational curricula, highlighting its impact on students' cognitive, emotional, and social growth. The study delves into the core components of SEL, including self-awareness, self-regulation, social awareness, relationship skills, and responsible decision-making.

These elements equip students with the ability to navigate challenges, develop empathy, and maintain positive relationships, thereby enhancing both their personal and academic lives. Furthermore, the role of teachers in implementing SEL is discussed, emphasizing the need for professional development and training to create emotionally supportive learning environments. Research findings suggest that SEL programs contribute to improved academic performance, reduced behavioral issues, and enhanced mental health among students. Schools that integrate SEL witness a more inclusive and positive classroom atmosphere, leading to increased student engagement and motivation. Additionally, the incorporation of SEL strategies has shown long-term benefits, preparing students for professional and personal success by fostering critical life skills such as communication, adaptability, and emotional resilience. This paper also examines various methodologies for effective SEL implementation, including project-based learning, mindfulness practices, peer collaboration, and digital tools. Challenges in integrating SEL, such as resistance to curriculum modifications and the need for teacher training, are analyzed, along with potential solutions to overcome these barriers. In conclusion, social and emotional teaching and learning is a transformative approach that nurtures students' emotional well-being, social skills, and academic success. As education systems evolve, embedding SEL within pedagogical frameworks will be instrumental in cultivating emotionally intelligent and socially responsible individuals. Future research should focus on developing comprehensive SEL assessment tools and exploring innovative strategies for seamless integration into diverse educational settings.

FROM SCREEN TO SUSTAINABILITY: EXPLORING *THE WILD ROBOT* AS A TOOL FOR SDG EDUCATION

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The intersection between multidisciplinary research sustainable development and storytelling is explored through the animated movie *The Wild Robot*. This paper analyses the movie through the lens of Sustainable Development Goals (SDGs), which reveals the compelling narrative of the movie. The paper highlights the intersection of ecology, technology, education and social inclusion. The movie emphasizes themes such as environmental stewardship, responsible innovation, and the role of education in promoting sustainability. The story illustrates the potential of

storytelling as a tool for promoting sustainable development values. The researcher connects the film's core message to the SDG 13, 'Climate Action', SDG 15 'Life on Land', SDG 9 'Industry, Innovation and Infrastructure', and SDG 4 'Quality Education'. The narrative illustrates the importance of responsible resource management and the harmonious coexistence of technology and nature, reflecting current trends in the integration of sustainable practices in technological innovation. Roz's process of learning symbolizes the crucial role of education in fostering sustainable mindsets and critical thinking. The themes of inclusion and social equity resonate with the SDG 10 ' Reduced Inequalities'. The paper underscores the value of cross-disciplinary research in promoting sustainable development. This paper also contributes to the discourse on innovative approaches to sustainability education. It emphasises the importance of multidisciplinary collaboration in addressing complex sustainability challenges, showcasing how art and media can play an integral role in fostering sustainability awareness.

MULTIFACETED APPLICATIONS OF BLACK PEPPER (PIPER NIGRUM): CULINARY, MEDICINAL, AGRICULTURAL, AND INDUSTRIAL PERSPECTIVES

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Black pepper (Piper nigrum), known as the "King of Spices," is one of the most widely used spices worldwide. Beyond its culinary significance, black pepper possesses numerous medicinal, industrial, and agricultural applications, making it a valuable natural resource. This paper explores the diverse uses of black pepper, emphasizing its role in food, traditional medicine, pharmacology, agriculture, and industry. In the culinary world, black pepper is an essential spice due to its pungent flavor and aroma, which enhances the taste of various dishes. It is used globally in different cuisines as a seasoning and preservative. Additionally, black pepper contains bioactive compounds, primarily piperine, which contribute to its various health benefits. Medicinally, black pepper has been used in traditional medicine systems such as Ayurveda, Traditional Chinese Medicine, and Unani for centuries. It exhibits antioxidant, anti-inflammatory, antimicrobial, and digestive properties. Piperine, the key alkaloid in black pepper, enhances the bioavailability of several nutrients and drugs, making it a significant component in modern pharmaceutical formulations. Studies suggest that black pepper may aid in weight management, improve cognitive function, and possess anticancer properties. In agriculture, black pepper is cultivated in tropical regions, particularly in India, Indonesia, Vietnam, and Brazil, contributing

significantly to the global spice trade. It is used in organic farming as a natural pesticide due to its antimicrobial properties. Additionally, its extracts serve as bio-enhancers in plant growth and soil enrichment. Industrially, black pepper and its derivatives, such as essential oils and oleoresins, are utilized in food processing, cosmetics, and perfumery. It is an essential ingredient in herbal teas, nutraceuticals, and functional foods. The spice also finds applications in aromatherapy and traditional wellness practices. Despite its extensive uses, challenges such as climate change, pest infestations, and adulteration impact black pepper production and quality. Sustainable cultivation practices and advanced processing technologies can enhance its commercial value. This paper highlights the multifaceted applications of black pepper, underlining its significance in various domains. Further research on its pharmacological potential and sustainable cultivation methods can unlock new possibilities for its utilization in food, medicine, and industry.

PERFORMANCEENHANCEMENTOFHIGH-STRENGTHCONCRETE THROUGH TRIPLE BLENDING OF FLYASH, SILICA FUME, AND STEEL FIBERS

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Compressive strength is a critical property of concrete, significantly influencing its application in the construction industry. This study examines the combined effect of fly ash (FA), silica fume (SF), and steel fibers on the compressive, split tensile, and flexural strength of high-strength concrete. Fly ash and silica fume were used as partial replacements for cement, while steel fibers were incorporated at varying percentages by volume of concrete.Concrete samples were prepared in three sets. The first set contained 0% fly ash and silica fume replacements of 0%, 5%, 10%, and 15%, with no steel fiber inclusion. In the second set, the fly ash content was increased to 20%, while silica fume levels remained unchanged, still without steel fibers. The third set followed the same silica fume replacement levels but with 40% fly ash. These combinations were then replicated with steel fiber additions of 0.5% and 1% by volume of concrete. After 28 days of curing, all samples were tested for compressive, split tensile, and flexural strength. The results revealed that the optimal mix—containing 20% fly ash, 10% silica fume, and 1% steel fiber—achieved the highest compressive strength of 81.20 N/mm² and a maximum flexural strength of 8.40 N/mm². These findings demonstrate that triple blending can significantly enhance the

mechanical properties of high-strength concrete, making it a promising approach for improving structural performance.

ANALYSISOFSTABILITYANDDYNAMICRESPONSEOFSOIL FOUNDATIONS UNDER HEAVY HAUL RAILWAY TRACKS

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Therailwayroadbed is acriticalcomponent oftrack infrastructure, servingasthe foundationthat supports train loads while maintaining track stability. However, it is also the most deformable and heterogeneous element, making it highly susceptible to degradation under continuous dynamic loading. The increasing demand for heavy haul railway systems has intensified the cyclic stresses exerted on track foundations, leading to accelerated deterioration, increased maintenance costs, and potential safety concerns. This study investigates the stability and dynamic response of soil foundations under heavy haul railway tracks, with a focus on the mechanisms of deformation, failure, and soil degradation. The primary causes of track foundationdi stress, including excessive settlements, ballast breakdown, andsubgrade instability, are analyzed in detail. The interaction between cyclic train loads and the soil environment is explored, emphasizing how repeated loading contributes to progressive failure. To mitigate these issues, various soil reinforcement techniques and advanced stabilization methods are evaluated, including geosynthetics, soil improvement additives, and innovative drainage solutions. The effectiveness of these reinforcement strategies in enhancing track longevity and reducing maintenance costs is assessed through engineering analysis and case studies. Overall, this research provides valuable insights into improving the resilience ofrailway roadbeds under heavy haul conditions. By understanding the factors influencing track stability and implementing appropriate reinforcement strategies, the efficiency and safety of railway operations can be significantly enhanced.

ENHANCED SOLUTION TECHNIQUES FOR FRACTIONAL DISPERSIVE PDEs: ITERATION METHOD AND OTHER ADVANCED APPROACHES

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This study presents a comprehensive approach for solving third-order fractional dispersive partial differential equations (PDEs) in multi-dimensional spaces using the fractional variational iteration method (FVIM). The FVIM is applied in conjunction with other powerful techniques, including the Adomian decomposition method (ADM), the homotopy analysis method (HAM), and the differential transform method (DTM), to evaluate their performance and accuracy in solving fractional PDEs. Fractional calculus, which generalizes traditional calculus by introducing non-integer order derivatives and integrals, is increasingly being recognized for its ability to model complex systems exhibiting memory and hereditary properties.The research explores the potential of these methods in solving real-world problems that involve fractional dynamics, such as in fluid mechanics, wave propagation, and diffusion processes. Additionally, we propose a novel hybrid approach by combining FVIM with the Laplace transform and variational principles to enhance the solution accuracy and computational efficiency. The results highlight the flexibility and robustness of the FVIM, showcasing its superiority in handling nonlinear and fractional PDEs. The findings not only validate the effectiveness of FVIM but also open up new avenues for using fractional methods in various applied sciences and engineering fields, including material science, thermodynamics, and financial modelling.

TRADE AND CULTURAL EXCHANGE ON THE SILK ROAD: A HISTORICAL PERSPECTIVE

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The Silk Road, an extensive network of trade routes connecting East and West, played a crucial role in shaping global history by facilitating economic, cultural, and technological exchanges. Originating during the Han Dynasty (206 BCE–220 CE), this trade network linked China, Central Asia, India, the Middle East, and Europe, fostering unprecedented cross-cultural interactions. This paper explores the historical significance of the Silk Road, emphasizing its role in trade and cultural exchange.

Merchants, pilgrims, and travelers carried goods such as silk, spices, precious metals, and ceramics, contributing to the prosperity of civilizations along the route. However, the Silk Road was more than just a conduit for commerce; it became a melting pot of ideas, religions, and artistic influences. Buddhism, Islam, Christianity, and Zoroastrianism spread across regions, shaping religious and philosophical thought. Artistic styles, architectural techniques, and literary traditions also traveled, leading to a rich cultural synthesis that influenced societies for centuries. The paper also examines the geopolitical impact of the Silk Road, highlighting how empires such as the Roman, Persian, Mongol, and Ottoman utilized and controlled these trade routes to enhance their political power. Furthermore, the role of technology, including advancements in navigation, papermaking, and printing, facilitated knowledge transmission, paving the way for scientific progress in medieval Europe and Asia. Despite its decline due to maritime trade routes in the 15th century, the legacy of the Silk Road remains relevant today, inspiring modern initiatives such as China's Belt and Road Initiative (BRI), which seeks to revive its spirit of connectivity and cooperation. By analyzing historical records, archaeological findings, and scholarly interpretations, this study provides a comprehensive understanding of the Silk Road's enduring impact on trade, culture, and global interconnectedness. This research contributes to historical discourse by emphasizing the Silk Road's role in shaping civilizations and fostering a globalized world. It underscores the importance of intercultural dialogue and economic collaboration, drawing lessons from history to inform contemporary global trade and diplomacy.

INFLUENCE OF AI TECHNOLOGY IN MANAGING SUSTAINABLE HR PRACTICES: A CASE STUDY ON WOMEN ENTREPRENEURS IN ASSAM

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AI technology in sustainable HR practice provides competitive advantage to the firm by creating powerful synergy between the used resources and company goal with automatic task process. The process of data identification and analysis using AI replaces human intervention and includes AI supporting environmental and social governance based on data analysis and tracking processes. Along with the significant

growth of women entrepreneurship in Assam, the demand for AI-driven services is also expanding in Assam based on the changing dynamics of Industry 4.0. Regarding this, the use of AI-powered tools and software, as Chabot's, CRM and other HR practices provides agility to predict the customers' needs and focus on the areas of improvement on an urgent basis. This research has evaluated the significance of AI in sustainable HR practices and the ratio of women entrepreneurs prefer to adopt this technology in their new business plan. Addressing the issues of women entrepreneurs to gather funds, social support and technological knowledge for AI implementation enriched this research to suggest relevant actions in improving such conditions and support sustainable business growth. A quantitative primary method in this research has included personal experiences of women entrepreneurs and associated people in AI implementation and developing sustainable HR practices. Hence, a critical finding on Assam's scope in AI development and supporting the growth of women entrepreneurs can leverage the sustainable business plan by reducing human intervention and developing automated task process.

NANOSTRUCTURED MATERIALS FOR ENERGY STORAGE AND CONVERSION: ADVANCES, CHALLENGES, AND FUTURE PROSPECTS

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Nanostructured materials have emerged as promising candidates for energy storage and conversion applications due to their unique physicochemical properties, high surface-to-volume ratio, and tunable electronic structures. These materials, including nanoparticles, nanowires, nanotubes, and two-dimensional nanomaterials, exhibit enhanced electrochemical performance, making them suitable for applications such as batteries, supercapacitors, fuel cells, and solar cells. In energy storage systems, nanostructured materials play a crucial role in improving the efficiency and stability of lithium-ion batteries (LIBs), sodium-ion batteries (SIBs), and other advanced battery technologies. Their ability to facilitate rapid ion diffusion and provide high electrical conductivity enhances the charge/discharge rates, cycling stability, and overall energy density of these storage devices. Furthermore, nanostructured electrode materials, such as transition metal oxides, sulfides, and carbon-based nanocomposites, offer superior electrochemical properties for next-generation energy storage solutions. For energy conversion applications, nanostructured materials contribute significantly to the development of efficient catalysts for fuel cells and hydrogen production via electrolysis. Platinum-based nanocatalysts, metal-organic

frameworks (MOFs), and perovskite nanomaterials have demonstrated excellent catalytic activity and durability, thereby improving the efficiency of energy conversion processes. Additionally, nanostructured semiconductor materials, such as quantum dots and perovskite nanocrystals, enhance the light absorption and charge separation mechanisms in photovoltaic cells, leading to higher power conversion efficiencies in solar energy harvesting. Despite the remarkable progress, challenges such as large-scale synthesis, stability, and cost-effectiveness of nanostructured materials remain critical barriers to their widespread commercialization. Future research must focus on developing scalable fabrication techniques, improving long-term stability, and exploring eco-friendly nanomaterials to ensure sustainable energy solutions. This review highlights recent advancements in nanostructured materials for energy storage and conversion, discussing their synthesis, properties, and applications. The study also emphasizes key challenges and future directions, providing insights into the potential of nanomaterials in revolutionizing modern energy technologies. By leveraging the advantages of nanoscience, researchers can contribute to the development of high-performance, cost-effective, and environmentally friendly energy systems to meet the growing global energy demands.

USES OF TURMERIC: A COMPREHENSIVE REVIEW

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Turmeric (Curcuma longa), a golden-yellow spice widely used in culinary and medicinal applications, has gained global recognition for its diverse benefits. Rich in bioactive compounds, particularly curcumin, turmeric exhibits significant antioxidant, anti-inflammatory, antimicrobial, and anticancer properties. This paper explores the traditional and modern uses of turmeric across various domains, including healthcare, food preservation, cosmetics, and agriculture. In traditional medicine, turmeric has been a key component of Ayurvedic and Chinese medicine for centuries, used to treat digestive disorders, respiratory ailments, skin conditions, and wounds. Modern pharmacological studies confirm its effectiveness in managing chronic diseases such as arthritis, diabetes, cardiovascular diseases, and neurodegenerative disorders due to its potent anti-inflammatory and antioxidant properties. Furthermore, curcumin is being researched for its potential role in cancer prevention and treatment. In the food industry, turmeric is used as a natural coloring and flavoring agent, enhancing both taste and nutritional value. Its antimicrobial properties contribute to food preservation by inhibiting bacterial and fungal growth. Turmeric extracts are also widely used in the

cosmetics industry due to their skin-enhancing benefits, including acne treatment, anti-aging effects, and skin brightening. Beyond human health, turmeric is employed in agriculture as a natural pesticide and soil enhancer, promoting sustainable farming practices. It is also being explored in animal feed to improve livestock health and productivity. Additionally, recent advancements in nanotechnology have facilitated the development of curcumin-based drug delivery systems, improving its bioavailability and therapeutic potential. Despite its numerous benefits, turmeric's low bioavailability poses a challenge, necessitating further research on enhancing its absorption and efficacy. This review highlights the multifaceted applications of turmeric, emphasizing its significance in health, industry, and environmental sustainability. Future studies should focus on developing innovative formulations and clinical trials to expand its therapeutic and commercial potential.

NEURO MARKETING: A STEP TOWARDS FUTURE

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In recent years, the field of marketing research has seen the emergence of a novel tool known as neuromarketing. This innovative approach leverages brain research within a managerial framework and has gained considerable traction in both academia and industry. Since it first captivated advertisers in early 2002, neuromarketing has streamlined the understanding of consumer behavior by probing into the intricacies of the mind. This paper investigates the conceptual importance of neuromarketing as a potent instrument for marketers navigating today's dynamic market, characterized by increasingly sophisticated consumers. This study aims to highlight the rise and importance of neuromarketing, along with current practices associated with it, such as neuroimaging, EEG, FMRI, and eye tracking. Additionally, we delve into the notion of consumer dialectics, which reveals how consumers often exhibit contradictions between their articulated desires and their emotional-driven actions. In contemporary marketing research, there's a notable emphasis on four key dimensions of consumers: the physical body, mind, heart, and spirit. Neuromarketing practices play a crucial role in exploring these components, enhancing the overall understanding of consumer behavior.

SOCIAL AND EMOTIONAL TEACHING AND LEARNING

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Social and Emotional Learning (SEL) is an educational framework that focuses on developing essential life skills to foster emotional intelligence, interpersonal relationships, and responsible decision-making. SEL encompasses five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. By integrating SEL into educational curricula, students learn to understand and manage their emotions, empathize with others, build healthy relationships, and navigate social challenges effectively. Research indicates that SEL programs not only improve academic performance but also reduce behavioral issues, enhance mental health, and promote long-term success in personal and professional life. As schools and communities increasingly recognize the importance of holistic education, SEL has emerged as a critical component in preparing individuals to thrive in a complex, interconnected world. This abstract highlights the significance of SEL in fostering well-rounded, emotionally intelligent individuals capable of contributing positively to society. This paper discusses the importance of SEL in contemporary education, its key components, implementation strategies, and its impact on student outcomes. It also explores the challenges of integrating SEL into traditional curricula and offers solutions to overcome these barriers.

EMPLOYEE ATTITUDES TOWARDS ENVIRONMENTAL SUSTAINABILITY: A COMPREHENSIVE STUDY

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The effectiveness of company sustainability initiatives greatly depends on the attitudes of employees, since environmental sustainability has grown in importance for businesses worldwide. This study provides a thorough analysis of secondary data about employee viewpoints on environmental sustainability at work. The study included a wide range of academic publications, corporate records, and global polls published between 2014 and 2024 in an effort to identify key trends, critical

components, and best practices. The findings demonstrate that although workers' general awareness of environmental issues has increased over the previous 10 years, there is a discernible difference in their degree of engagement across different sectors, organizational settings, and geographic locations. dynamics affecting how employees feel about sustainability. Employee opinions are influenced by a number of significant factors, including organizational culture, leadership commitment, personal convictions, and the perceived effectiveness of sustainability initiatives. Apart from outlining the strategies that firms utilize to encourage positive attitudes towards environmental sustainability, the report also describes common barriers to employee involvement. Apart from offering valuable perspectives for organizations seeking to enhance employee engagement for better environmental outcomes, this study contributes to the comprehension of the complex factors affecting employees' perspectives on sustainability.

SOCIAL AND EMOTIONAL TEACHING AND LEARNING

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Social and Emotional Teaching and Learning is a framework that integrates emotional intelligence, interpersonal skills, and self-regulation into educational settings. It aims to enhance students' emotional awareness, empathy, decision-making, and relationship-building skills, fostering overall well-being and academic success. SETL emphasizes the importance of a supportive learning environment, where educators model emotional competence and create inclusive, engaging classrooms. Research highlights the role of SETL in improving students' academic performance, reducing behavioral issues, and promoting mental health. Strategies such as mindfulness, collaborative learning, and conflict resolution training help students navigate social interactions and personal challenges. Additionally, SETL benefits educators by reducing burnout and increasing job satisfaction. As education shifts towards holistic development, incorporating SETL into curricula becomes essential. Schools must integrate evidence-based social-emotional learning programs and provide teacher training to ensure effective implementation. Future research should explore the long-term impacts of SETL on different age groups and cultural contexts. By prioritizing SETL, educators can create well-rounded individuals who thrive academically, socially, and emotionally. Keywords:- Social, Emotional, Teaching, Learning and Research.

ELECTROCHEMICAL SENSORS FOR RAPID DETECTION OF ENVIRONMENTAL POLLUTANTS

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Environmental pollution has emerged as a critical global concern due to the rapid industrialization and urbanization that contribute to water, air, and soil contamination. The conventional methods for pollutant detection, such as chromatography and spectrometry, are highly accurate but often time-consuming, expensive, and require specialized laboratories. In contrast, electrochemical sensors have gained significant attention as rapid, cost-effective, and sensitive tools for detecting various environmental pollutants, including heavy metals, pesticides, organic compounds, and gases. This paper provides a comprehensive review of the advancements in electrochemical sensors for environmental monitoring. It discusses different types of electrochemical sensors, including amperometric, potentiometric, and impedimetric sensors, highlighting their working principles, electrode materials, and modifications that enhance selectivity and sensitivity. Special emphasis is placed on nanomaterial-based sensors, which offer superior detection limits and stability due to their high surface area and conductivity. The integration of molecularly imprinted polymers (MIPs) and enzyme-based sensors has further improved specificity for target pollutants. Additionally, the development of portable and real-time sensing devices, coupled with wireless and smartphone-based technologies, has revolutionized environmental monitoring, enabling on-site analysis with minimal sample preparation. However, challenges such as electrode fouling, interference from complex environmental matrices, and sensor stability need to be addressed to improve long-term usability. Future research should focus on enhancing sensor durability, miniaturization, and automation for large-scale applications. The review concludes that electrochemical sensors hold immense potential for real-time environmental pollution monitoring due to their high sensitivity, rapid response, and ease of use. Their integration with emerging technologies such as artificial intelligence and the Internet of Things (IoT) could further enhance data analysis and predictive capabilities, contributing to sustainable environmental management.

THE IMPORTANCE OF LITERATURE: A CATALYST FOR EDUCATION, CULTURE, AND SOCIAL TRANSFORMATION

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Literature has played a fundamental role in shaping human civilization, influencing culture, education, and societal values. It serves as a reflection of human experiences, emotions, and ideologies, allowing individuals to gain deeper insights into history, psychology, and philosophy. The importance of literature extends beyond mere storytelling; it acts as a medium for preserving knowledge, promoting critical thinking, and fostering empathy. This paper explores the multifaceted significance of literature in different spheres, including education, social development, and intellectual growth. Literature acts as a bridge between past and present, helping societies learn from historical events, cultural traditions, and philosophical discourses. Classic and contemporary literary works provide a platform for dialogue on social issues, moral dilemmas, and human psychology, thereby shaping perspectives and attitudes. In the field of education, literature enhances linguistic proficiency, analytical skills, and creativity. It encourages students to engage with diverse ideas, enhancing their ability to interpret and articulate complex concepts. Furthermore, literature promotes emotional intelligence by allowing readers to experience and understand various emotions through characters and narratives. This emotional connection fosters empathy and broadens one's worldview. From a societal perspective, literature is a tool for social reform and transformation. Many literary works have challenged stereotypes, questioned injustices, and advocated for change. Writers like William Shakespeare, Rabindranath Tagore, and George Orwell have influenced political thought and societal norms through their works. Literature also plays a crucial role in preserving cultural heritage by documenting traditions, folklore, and indigenous wisdom. In the modern digital era, where technological advancements dominate communication, literature continues to hold relevance. Digital literature, audiobooks, and online storytelling platforms have expanded access to literary works, ensuring that literature remains an integral part of human development. In conclusion, literature is not merely a form of entertainment; it is a powerful instrument for education, cultural preservation, and social progress. Its influence on personal and societal development highlights the need for continued engagement with literary works across generations.

CHARGE CARRIER DYNAMICS IN N719 DYE BASED DSSCs

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In the last decade, dye-sensitized solar cells (DSSCs) have gained a significant attention as a cost-effective alternative to traditional silicon-based solar cells. The dye, which acts as a photosensitizer, plays a crucial role in the performance of DSSCs. Various dyes have been explored for this purpose, with metal-based sensitizers demonstrating the highest efficiency. This paper investigates the Voltage – Current characteristics and impedance spectroscopy properties of DSSCs utilizing N719, a metal-based photosensitizer. The findings indicate improved performance in terms of photon absorption and power conversion efficiency.

SOCIAL AND EMOTIONAL LEARNING

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Social and Emotional Learning (SEL) is an essential educational approach that helps students develop the skills needed to understand and manage their emotions, form healthy relationships, and make responsible decisions. It focuses on building self-awareness, self-control, and empathy, which are critical for both personal and academic success. It is an essential educational approach that helps students develop the skills needed to understand and manage their emotions, form healthy relationships, and make responsible decisions.SEL plays a key role in helping students recognize their emotions and express them in a healthy way. By developing self-awareness, students can identify their strengths and areas for growth, leading to greater self-confidence. Self-control, another important aspect of SEL, allows students to manage their emotions and behaviors in different situations.Empathy, or the ability to understand and share the feelings of others, is also a fundamental part of SEL. When students learn to see things from other people's perspectives, they build stronger relationships and develop a sense of compassion. This not only improves their interactions with classmates, teachers, and family members but also reduces bullying and conflicts in schools.In addition, SEL fosters responsible decision-making. This prepares them for real-world challenges, from resolving disagreements to setting and achieving personal and academic goals. By practicing teamwork, communication, and conflict resolution, they develop the social skills needed to thrive in group settings. These abilities are crucial not only in school but also in future workplaces

and communities. Research shows that students who learn SEL are more confident, cooperative, and emotionally strong. They are better at solving problems, handling conflicts, and making positive choices. Schools that include SEL in their teaching see fewer behavior problems and a more positive learning environment. In conclusion, SEL is important for students' success in school and life. It helps them grow emotionally and socially, preparing them for future challenges. More research is needed to find new ways to teach SEL and understand its long-term impact on students from different backgrounds. Schools should focus on making SEL a regular part of education to help students become confident, kind, and responsible individuals.

ARTIFICIAL INTELLIGENCE ROLE IN STOCK MARKET

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Predicting stock prices is inherently challenging due to the market's unpredictable nature. This unpredictability has driven researchers to develop advanced predictive strategies. Artificial Intelligence (AI) has revolutionized stock market analysis by enabling rapid, accurate decision-making and uncovering insights that traditional methods cannot. AI is particularly useful in generating detailed analytical reports for the stock market, as highlighted by Business Insider Intelligence. This paper explores how AI is transforming the FinTech sector, including high-frequency trading, hedge funds, and capital markets. AI simplifies decision-making for investors, traders, and financial institutions. The paper also presents a SWOT analysis of AI in the stock market, discussing its challenges, potential applications, and expected models. Overall, AI empowers market participants to make informed decisions, enhance performance, and navigate volatile markets. With the growing popularity of mobile applications, the use of AI in finance is expected to expand, shaping the future of economics and financial markets.

ACTIVITY OF PLANT PART EXTRACTS AGAINST MITE *PAUROPSYLLATUBERCULATA* CRAWFORD

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Galls are any deviation in the normal pattern of plant growth produced by a specific reaction to the presence and activity of a foreign organism, such as an animal or plant parasite. Mite *Pauropsylla tuberculata* causes leaf gall disease in *Alastoniascholaris*. There are many plants of forest origin, such as *Annona squamosa*, *Albizia lebbek*, *Lantana camara*, *Pongamia pinnata*, *Eucalyptus globulus*, and *Limoniaacidissima*, that are reported to contain bioactive molecules in their plant parts and have the potential to act as pesticides. These bioactive molecules may kill or inhibit the growth of mites. In the present study, field trials of test plant leaf and seed extracts with neem oil-based emulsions were conducted on leaf galls of *Alastoniascholaris*.

CHEMICAL WASTE FROM SEMICONDUCTOR TECHNOLOGY

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Memory devices (Chip DRM, SRM), processor (CPU, APU GPU chip) and all type of display screens (LED monitor, LCD, CRT) are essential part of digital devices. All digital devices are made by a special group of chemical substances which are known as Semiconductors. Special property of semiconductor material is that semiconductor's conducting property depends on temperature it increases with increase in temperature and decreases with decrease in temperature. Doping material quality and quantity can also modified conduction ability of semiconductors. Digital gazettes manufacturing process involves a number of harmful chemicals. These substances, similar to those used in the general semiconductor industry, include sulfuric acid, hydrogen fluoride, hydrochloric acid, nitric acid, 1,1,1-trichloroethane, and acetone. The manufacturing of digital devices includes some chemicals which can be toxic or harmful to the humankind. The potential for health concerns is not only depend on the material harmful characteristics, but also on certain conditions which must be taken into account. The toxicity of chemical depends upon the concentration of that chemical. To come under harmful effect a human or an animal must be come in surrounding where the devices are manufactured (industries, plant). Most often, the primary persons exposed to the device manufacturing residues are the plant workers.

The easiest exposure route for workers is inhalation of vapors or dusts and also via direct contact if spills occur.

GENDER AND EDUCATION: BRIDGING THE GAP FOR EQUALITY

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Gender and education are closely connected, influencing personal growth, society, and the economy. In the past, there were large differences in education opportunities for boys and girls, with girls facing more challenges in accessing and completing school. While progress has been made, gender inequality in education still exists due to social traditions, financial barriers, and gaps in policies.Education is a powerful tool for gender equality, giving people knowledge, skills, and confidence. However, gender differences appear in many ways, such as lower school enrolment for girls, gender-stereotyped subjects, and unfair treatment in classrooms. Global efforts, like the United Nations' Sustainable Development Goals (SDG 4 on quality education and SDG 5 on gender equality), have helped improve education policies and increase literacy among girls. Yet, challenges remain, especially in poor and war-affected regions.A major reason for gender inequality in education is cultural beliefs. In some communities, girls are expected to take care of household chores instead of going to school, leading to higher dropout rates. Similarly, boys in some areas are pushed into early jobs, limiting their education. To close this gap, gender-sensitive teaching methods are needed. Schools must create learning environments that break stereotypes and treat boys and girls equally. Financial problems also play a big role in gender inequality. Poor families often choose to educate boys over girls because of limited resources. Providing scholarships, free school meals, and cash support for families has been effective in keeping more girls in school. Gender gaps also exist in higher education and STEM (Science, Technology, Engineering, and Mathematics) fields, where fewer women pursue careers. Encouraging girls through mentorship, role models, and supportive policies can help create a more balanced workforce.To achieve gender equality in education, governments, schools, and communities must work together. Investing in fair and inclusive education systems will not only help individuals but also contribute to a stronger and more developed society. In conclusion, while we have made progress in reducing gender differences in education, there is still more work to be done. By creating fair policies, breaking

gender stereotypes, and ensuring equal opportunities, education can help build a more equal world for everyone.

GROWTH AND FORECASTING PERFORMANCE OF SOYBEAN IN INDIA

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The present study was conducted with objective of estimation of growth performance of soybean. From study, it was revealed that, significant growth (1.83 %) was found incase of area under soybean over the period under study. Similar results were found by (Ajaykumar *et al.*2023, Mishra *et al.* 2023). But non-significant growth was observed incase of production and productivity indicates that, there is need to adopt modern and high yielding practices which increases the production and productivity of soybean. It was also concluded that, the highest variation in case of area under soybean was observed in Uttar Pradesh i.e. 62.41 per cent whereas lowest variation was found in Madhya Pradesh i.e. 8.31 per cent. It indicates that, area under Uttar Pradesh is less consistent and which is more consistent in Madhya Pradesh. The highest variation in case of production of soybean was observed in Gujrat whereas lowest variation was observed in Telangana. It indicates that less consistency incase of production was found in Gujrat and more consistency was found in Telangana. The highest variation in case of productivity of soybean was observed in Uttar Pradesh where as lowest was found in Nagaland. It indicates that less consistency incase of production was found in Uttar Pradesh and more consistency was found in Nagaland. The ARIMA model indicated increasing trend in case of area and production and constant growth was observed in case of productivity of soybean crop in India for the year 2022 to 2028.

CHALLENGES AND OPPORTUNITIES FOR NEOBANKS IN A CASHLESS INDIA

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India’s shift towards a cashless economy, driven by technological advancements and government initiatives such as Digital India and the widespread adoption of UPI, presents both significant opportunities and challenges for emerging digital-first financial institutions, particularly neobanks. Neobanks, which operate entirely online without physical branches, are well-positioned to leverage the growing demand for seamless, tech-driven banking solutions. Their ability to offer cost-effective, mobile-first banking services aligns perfectly with the needs of a digital-savvy, increasingly cashless society. This paper explores the key opportunities for neobanks in India, including expanding financial inclusion to underserved populations, driving innovation in digital payments, and offering enhanced customer experiences through the use of AI, data analytics, and mobile platforms. These factors are essential in supporting India's rapid digital transformation and the move away from traditional cash-based transactions. However, the rise of neobanks is not without its challenges. Regulatory uncertainty, cybersecurity risks, and customer trust concerns pose significant barriers to their widespread adoption. Additionally, the lack of physical presence and limited brand recognition can make it difficult for neobanks to compete with well-established traditional banks. Addressing these issues requires careful navigation of regulatory frameworks, enhanced security protocols, and strategic initiatives to build customer confidence. The paper concludes by emphasizing that while neobanks face considerable challenges, their innovative business models, adaptability, and focus on cost efficiency provide significant opportunities to shape India’s cashless future. Through strategic collaboration with regulators and traditional banks, along with investments in customer education and cybersecurity, neobanks can overcome these hurdles and play a pivotal role in India's transition to a fully digital economy.

CONTRIBUTION OF COMMUNITY BASED SERVICES TO IMPROVING MENTAL HEALTH

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Community-based mental health care emphasizes providing mental health services within a person's local community, promoting accessibility, and integrating mental health services into existing systems like primary care and schools. Community provides a sense of belonging to a group you identify as being a part of it. This is different than conforming to be in a group. A true sense of belonging includes the ability for you to feel you are a part of the community as your true self.The importance of Community-based mental health can be because of its role in**improving outcomes,** cost effectiveness, direction of right projects, ability to inequalities, reduction of stigma and create supportive environments. Community-based care can lead to better mental health outcomes, physical health, and quality of life.Moving patients from institutions to community care can be more cost effective. Community care can better protect the rights of people with mental health disorders. Communities can help reduce mental health inequalities by providing resources and education. Community-based care can help reduce stigma and misconceptions about mental health. Community-based care can provide crisis care when a referral to a private therapist isn't possible. Community-based care can help create safe and supportive living environments. Community-based mental health care is person-centered and recovery-based, and it aims to ensure that everyone has access to a range of services and support. Besides being more efficient, community-based services are also better equipped to identify mental health concerns at an early stage, reducing the need for crisis intervention. This approach benefits individuals, alleviates the burden on emergency services and reduces the overall cost of mental health care.

EVALUATION OF PERFORMANCE OF LISTED INDIAN STARTUPS

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The rapid emergence of startups in India, fueled by a dynamic entrepreneurial ecosystem, has led to an increasing number of these companies getting listed on stock exchanges. Evaluating their financial performance post-listing is crucial for investors, policymakers, and stakeholders to assess their long-term sustainability and market impact. This study aims to analyze the performance of publicly listed Indian startups using financial metrics such as Compounded annual growth rate, standard deviation, corelation and covariance to gauge the volatility and performance of these entities. The research employs a quantitative approach, utilizing historical financial data and stock performance metrics from various Indian startups listed on the NSE and BSE. . Furthermore, correlation analysis between startup stock performance and market indices such as the Nifty 50 is conducted to examine their sensitivity to broader market movements. These startups include Ola electric, Zomato, PolicyBazaar, Honasa consumer, Delhivery, Ixigo, Nazara technology, Nykaa, and Unicommerce. Findings indicate that while some listed startups have demonstrated strong revenue growth and market capitalization expansion, many struggle with profitability due to high operating costs and aggressive expansion strategies. The study highlights the disparity in performance across different sectors, with technology-based startups exhibiting higher valuation multiples compared to traditional industries. Additionally, the correlation between startup stock returns and the broader market remains inconsistent, suggesting varying investor sentiment and risk perception. The market also has witnessed new age young investors with high risk appetite who have a positive outlook to startups, especially consumer brands for whom such data is relevant to make big bets at nascent stages of the organisation. It also evaluation if this IPO listing boom is a frenzy or they are materially adding shareholder value. This research provides valuable insights for investors seeking to allocate capital to high-growth startups while managing risk. It also offers policymakers a data-driven perspective on the financial sustainability of listed startups, contributing to discussions

on regulatory frameworks and market stability. The study concludes that while listed Indian startups present significant growth potential, careful financial assessment and strategic investment decisions are essential to mitigate risks associated with their volatile nature.

MATHEMATICAL ANALYSIS AND APPLICATIONS OF THE RADIUS OF CURVATURE IN SCIENCE AND ENGINEERING

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The radius of curvature is a fundamental concept in differential geometry, physics, and engineering, playing a crucial role in the analysis of curves, surfaces, and structural stability. This paper presents an in-depth study of the radius of curvature, emphasizing its mathematical formulation, practical applications, and significance in various scientific fields. The radius of curvature is mathematically defined as the reciprocal of the curvature of a curve at a given point, representing the radius of an osculating circle that best approximates the curve at that point. In this study, we derive the radius of curvature for different types of curves, including plane curves, space curves, and surfaces, using calculus-based approaches. The paper also explores its applications in physics, particularly in mechanics and optics, where it influences motion trajectories and lens focusing properties. Additionally, in structural engineering, the radius of curvature is crucial for assessing beam bending, road design, and railway track alignment to ensure safety and efficiency. Furthermore, numerical methods and computational techniques for determining the radius of curvature are discussed, highlighting their relevance in modern computational geometry and computer-aided design (CAD). Experimental validation through real-world case studies is also provided to demonstrate its practical importance. By integrating theoretical insights with practical applications, this research enhances the understanding of the radius of curvature and its role in various scientific and technological domains. The findings of this study contribute to improved methodologies in engineering design, material science, and computational modeling, paving the way for future advancements in precision engineering and geometric analysis.

LABORATORY EVALUATION OF NATURAL FIBER-REIN FORCED BITUMINOUS MIXES

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Bituminous mixtures are composed of coarse aggregate, fine aggregate, filler, and binder. Hot Mix Asphalt (HMA) is a widely used bituminous mixture where all components are mixed, placed, and compacted at high temperatures. Depending on gradation, HMA can be classified as Dense Graded Mixes (DGM), commonly known asBituminousConcrete (BC),or gap-gradedmixeslikeStoneMatrix Asphalt(SMA). SMArequiresstabilizingadditivessuchascellulosefibers,mineralfibers,orpolymers to prevent mix drain-down.This studyexplores the use of **sisal fiber**, a naturally and locallyavailable fiber, as a stabilizer inSMAand as anadditive in BC. The aggregate gradation was selected based on MORTH specifications, with binder content varying from 4% to 7% and fiber content ranging from 0% to a maximum of 0.5% of the total mix. A preliminary study identified **fly ash** as an effective filler, leading to its incorporation in subsequent mix designs. Using the **Marshall Procedure**, the **Optimum Fiber Content (OFC)** was determined to be 0.3% for both BC and SMA, while the **Optimum Binder Content (OBC)** was found to be **5% for BC and 5.2% for SMA**.

INCARCERATION AND RESISTANCE IN MEGHA MAJUMDAR'S *A BURNING*

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The paper argues how the protagonist of Megha Majumdar's *A Burning*(2020) resists the grave accusations of incarceration spread through a casual social media viral news. It also concentrates on the position of marginality of the protagonist which comes in the way of her efforts to prove her innocence. Being a victim of opportunism and privilege, the life of the protagonist Jivan becomes a living hell fighting a lone

battle against the agents of power and position which have an upper hand over her marginalized status. The PET sir, who has no hesitation in changing sides, forgetful of his commitment to his profession, and Lovely, an aspiring actress in search of her opportunities to become a showbiz have their perspectives too which gives added impetus to the narrative, a multi- faceted point of view enabling the reader to show empathy and consideration for the gripping tale of agony of the Muslim protagonist Jivan placed at the margin. How her physical displacement coincides with displacement of marginalized people across the globe also becomes the major talking point of the paper. An attempt is also made at what cost the protagonist copes with the fragmented versions of reality, which is the concern of both the writer as well as the protagonist, being unraveled in the course of the paper. Issues of "identity, belonging and cultural conflict" defining the marginal people's position in the mainstream society are also addressed in the novel for a subtle understanding of the complex global perspective of accommodating all cultural differences while living in a country away from one's roots. The paper also offers an insight into the existing diasporic experience addressed through cultural hybridity, displacement and the question of belonging.

A STUDY OF EMERGENCE AND PROMINENCE OF SOCIAL SECURITY IN INDIA

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In a developing nation like India, one of the best practices for achieving sustainable development goals is ensure an effectual social security system, primarily for unprivileged sections of the country so as to achieve equitable and inclusive growth of a society. Social Security is now progressively viewed as an integral part of the inclusive development process of a nation. In the Indian context, Social Security is generally assumed as a comprehensive approach designed to prevent deprivation, assure an individual of a basic minimum income for himself and his dependents and to protect the individual from any uncertainties. The state bears the primary responsibility for developing appropriate system for providing protection and assistance to its workforce. Sustainable social security scheme can create a more positive attitude to the challenge of globalization and the consequent structural and technological changes. For a prolonged period after Indian independence, exclusion of vast rural population from access to proper social security has been realized as the most serious hindrance towards economic progress of India. Financial Inclusion and its forward linkage to social security, by ensuring active participation of all section of

population, is one of the most essential milestones for achieving sustainable development goals in nation like India, presently celebrating as the 5th largest (GDP Rank) economy in the world. In this article, author attempted to deal with various ingredients underlying emergence of social security in global perspective and studied the conventional approaches classifying social security systems. The article has dealt with the concept of organized and unorganized workforce, and discussed the covenants demanding robust social security structure in any developing nation. The effectiveness of social security towards inclusive development in the society has been discussed broadly in this paper.

TRAINING FOR ORGANIZATIONAL SUCCESS

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The study is undertaken primarily with the objective to assess the role of training on organizational success. Today all types of organizations are functioning in a very dynamic environment. The external factors especially, the technology, competitive reactions, political scenario, regulatory mechanism, governance of the ruling parties at centre or state level, economic regulations at global level have drastically impacted the performance of the various organizations. The training and development function play a crucial role to improve the present performance and to cope up with the desired performance. Organizations have recognized and allocated huge amounts as investment for training function e.g., training infrastructure, latest

training technology / methods, equipment etc. The training is imparted on need based through its internal training facilities or external training facilities for improvement of performance. . The present study has carried out at Hyderabad. The intellectual respondents were contacted, and structured questionnaires were distributed to elicit the opinions. The data analysis was carried out by the application of simple statistical techniques. The primary data analysis has resulted in positive opinions towards training. The suggestions provided by subject experts in discussion e.g., Online / Computer Based Training / AI / ML, were incorporated. The overall observations resulted in that the training contributes for organizational success and productivity.

STRIVE TOWARDS ACHIEVING MDGSEMPLOYING INDIAN BANKING SYSTEM

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In any developing country, the endeavour ofachieving Millennium Development Goals (MDG) primarily needs support of a robust financial system, by ensuring inclusion and active participation of all section of population.The term ‘Financial Inclusion’ is nowadays become globallywidespread, which may be understood with insight about Financial Exclusion that basically describes thesituation; whereinindividual do not have access to mainstream financial services. Due to lack of easy access to formal financial system, rural population is inclined to informal sources and trapped to high cost debt, exacerbating the cycle of poverty. Financial Inclusion has now been accepted globally as the primary and most critical component for sustainable development of a nation. It was however never part of the Millennium Development Goals (MDG 2000). It took long time to arise as crucial agendaof developing countries, including at G20 in 2011. Subsequently in 2012, the alliance for Financial Inclusion (led bycentral banks of 35 emerging & developing countries)tendered commitment for financial inclusion. The level of inclusiveness in India was at dismal for a prolonged period after independence. Indian government had traditionally established Banks/FI to provide formal financial services. Apex FIs (viz. NABARD, IDBI and SIDBI) have well supported nation building in various ways, but government had miserably failed to address the necessity of financial inclusiveness in this developing nation. As per India’s Census 2011 data (population 1.22 billion), 65% of adults across the country were excluded from formal financial system. Another report of World Bank reveals that only 35.2% adults in India have access to formal financial institutions. Only 55% population was having savings accounts and merely 9% had credit relationship with Banks. This level of exclusion of

a larger population had been accentuated as serious hindrance to the economic progress of India. Financial inclusion has gradually emerged as obligatorymedium to implement various policies for achieving MDGs. During the last 20 years, Indian government hadframeddiversestrategies relying onthe unwavering support of banking channels. India has traversed a long journey to ensure inclusiveness across the country. This article dealt withkey policies,implemented through banking system that has made significant impact towards inclusive & sustainable development in India.

AN ANALYSIS OF TAX REFORMS IN INDIA IN CONTEXT OF GOODS AND SERVICES TAX AND ITS IMPACT ON HOTEL AND TOURISM

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The presented research analyses the effects of tax reforms in India on the tourism and hotel industry of Jaipur district of Rajasthan in the context of GST. In the research, primary facts have been collected from people associated with the hotel and tourism business in Jaipur city. In this, an attempt has been made to know what kind of impact GST had after its implementation in 2017. GST is one of the tax reforms that took place in India after independence. GST is an integrated single tax applicable on the supply of goods and services from the manufacturer to the consumer. The hotel business in India contributes about 6.23 percent to the national GDP and 8.78 percent to national employment. After the implementation of GST, there was a change in the hotel business that hoteliers started charging more cost than before. Along with this, consumers started getting discounts on not taking the bill. This also benefited that hoteliers are no longer able to hide their income. Due to the new system, hoteliers had to increase the cost of tourism related services and this led to consumers saying that this would be a tax hike. Due to this, tourism businessmen had to face the problem of higher costs for some time. Along with this, they also had to pay for the free items available in the hotel. Due to increased awareness among consumers, the extra charges levied on tourists decreased. Hoteliers were forced to keep their records properly due to GST and tourists benefited from it.

VEDIC CORPUS OF INDIAN KNOWLEDGE SYSTEM

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The corpus Vedic constitutes the basis of the Indian Knowledge System (IKS), having a wide and heterogeneous array of fields, viz., philosophy, linguistics, astronomy, mathematics, and medicine. Being among the oldest bodies of human knowledge, the Vedas—viz., Rigveda, Yajurveda, Samaveda, and Atharvaveda—convey deeply spiritual as well as scientific perceptions. This article examines the multi-faceted contribution of the Vedic texts to the development of India's knowledge traditions, tracing their influences on Ayurveda, Jyotisha (astronomy), linguistics, and mathematical sciences. It also discusses the knowledge preservation methods, including the oral transmission practices that helped perpetuate Vedic knowledge. The research highlights the applicability of Vedic wisdom in modern scholastic and inter-disciplinary research, connecting ancient and new scientific thinking. Through the review of these inputs, this work seeks to confirm the importance of the Vedic corpus in designing intellectual traditions as well as establishing holistic paradigms for learning.

MEDICAL BANKRUPTCY IN INDIA: CAUSES, EMPIRICAL ANALYSIS, AND STATISTICAL INSIGHTS

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Medical bankruptcyis a situation where individuals face financial distress due to overwhelming medical expenses that they are unable to pay. It occurs when the cost of medical treatments, surgeries, medications, and hospital bills becomes so high that it leads to severe financial strain. Lack of adequate health insurance coverage or unexpected medical emergencies can contribute to theoccurrenceofChapter 7 and Chapter 13 medicalbankruptcy.This paper is delved with the objectives to revisit the national scenario of medical bankruptcy along with identification of several factors affecting it and to understand the impact of the factors contributing to medical bankruptcy of individuals along with suggesting some remedial measures to get rid from the bankruptcy situation. This research on medical bankruptcyis grounded in the collection and analysis of primary survey over 105 Indian nationals with diverse nature of profession and income levels and gathered their views and opinions on the related topic to understand the association between the variables affecting the responses to

the issue under research.Thus we have classified our sample into certain categories – age, affiliation,and level of income. Further we proceed to study the impact that these categories exert on the opinion on the research issue, through measures of association- viz Goodman Kruskal Gama measure on ordinal data and Pearsonian Chi- square test on nominal data for the achievement of diverse objectives of this research study. This approach ensures the authenticity andspecificityofthefindings, tailored to the details factors affecting medical bankruptcy cases using R- software.

ADVANCING CRYPTOGRAPHIC SECURITY THROUGH GRAPH THEORY: A COMPREHENSIVE REVIEW

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Graph theory has become a pivotal area of research due to its broad applications in fields such as biochemistry (genomics), coding theory, communication networks, and cyber security. Recently, its integration into cryptography has garnered significant attention. This paper reviews the various ways in which graph theory is applied to cryptography, focusing on cryptographic algorithms that leverage general graph theory concepts, external graph theory, and expander graphs. In addition, we explore the potential of graph-theoretical models in enhancing cryptographic primitives, such as secure key exchange protocols, digital signatures, and encryption schemes. A novel perspective is presented on how graph theory could be used to construct new types of cryptographic systems with increased security and efficiency. Furthermore, we discuss emerging trends, including the use of quantum-resistant graph-based cryptographic protocols and the role of random graphs in improving the scalability of cryptosystems. This paper highlights the promising synergy between graph theory and cryptography and suggests future research directions to optimize these interdisciplinary approaches.

A STUDY ON ROLE OF TOUCH AS A SENSORY MARKETING STRATEGY IN INDIAN RETAIL CONTEXT

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Sensory marketing has gained significant traction in the Indian retail sector, with touch playing a pivotal role in influencing consumer perceptions and purchase behavior. This study explores the impact of tactile interactions as a strategic sensory marketing tool in Indian retail, particularly in the fashion and lifestyle segments. It examines how consumers' ability to touch and feel products enhances trust, perceived quality, and emotional engagement, ultimately shaping their behavioral intentions. Through an analysis of consumer responses, in-store experiences, and retailer strategies, this research highlights the significance of haptic cues in fostering brand loyalty and improving sales conversion rates. Additionally, the study delves into cultural and psychological factors influencing touch preferences in India's diverse retail landscape. The findings provide actionable insights for retailers to optimize store layouts, product displays, and customer engagement strategies, ensuring a more immersive and effective shopping experience.

THE INDUSTRIAL REVOLUTION AND ITS SOCIAL TRANSFORMATIONS

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The Industrial Revolution, spanning from the late 18th to the early 19th century, marked a transformative era in human history, fundamentally reshaping economies, societies, and cultures. This paper explores the profound social transformations triggered by industrialization, including shifts in demographics, labor structures, urbanization, and class dynamics. The transition from agrarian economies to mechanized industries led to mass migration from rural areas to burgeoning industrial cities, creating new urban centers characterized by overcrowding, poor sanitation, and social stratification. One of the most significant social changes was the rise of the working class and the decline of traditional artisanship. Factory-based production required a disciplined labor force, leading to the exploitation of workers, including women and children, under harsh conditions. This resulted in the emergence of labor movements and early trade unions, advocating for improved wages, reduced working hours, and safer working environments. Concurrently, the Industrial Revolution contributed to the expansion of the middle class, as entrepreneurs,

engineers, and industrialists prospered, thereby reshaping social hierarchies. Education and literacy rates saw an upward trend due to the growing need for skilled workers and clerical staff, leading to the establishment of public schooling systems in industrialized nations. Gender roles also underwent significant changes, with women increasingly participating in the workforce, albeit in lower-paying and less secure jobs, thereby laying the groundwork for future gender equality movements. Moreover, industrialization influenced political ideologies, fueling debates between capitalism and socialism. While some championed free-market principles, others criticized the inequalities generated by industrial economies, leading to the rise of socialist and Marxist thought. These ideological conflicts shaped labor laws, social welfare policies, and governance structures in the 19th and 20th centuries. The paper concludes that while the Industrial Revolution significantly improved production capabilities and living standards over time, it also introduced social challenges such as worker exploitation, economic disparity, and environmental degradation. Understanding these transformations provides valuable insights into modern industrial and technological revolutions, highlighting the need for balanced economic progress and social welfare.

ASSESSING PEDESTRIAN SAFETY ENHANCEMENTS WITH IN-PAVEMENT WARNING LIGHT SYSTEMS AT CROSSWALKS"

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Pedestrian safety remains a critical concern in transportation planning, as pedestrians are among the most vulnerable road users. The interaction between pedestrians and vehicles, particularly at higher speeds, significantly increases the risk of injury or fatality. Studies show that when struck at 40 mph, only 15% of pedestrians survive, whereas at 20 mph or lower, the survival rate rises to 95%. Despite ongoing efforts to improve pedestrian infrastructure, crashes involving pedestrians continue to be a major issue, accounting for 2% of all traffic injuries and 11% of traffic-related fatalities in the U.S. In 2003 alone, 4,749 pedestrians were killed, and 70,000 were injured in motor vehicle crashes, equating to one pedestrian fatality every 111 minutes and one injury every eight minutes. To mitigate these risks, innovative safety measures have been introduced, including the **Crosswalk In-Roadway Warning Light System**. Recently incorporated into the **Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD)**, this system, also

known as **in-pavement warning lights**, has been widely studied for its effectiveness in improving pedestrian visibility and driver compliance. Unlike traditional crosswalk treatments that simply indicate the presence of a crossing, in-pavement warning lights actively enhance visibility. These amber-colored lights are embedded in the pavement on both sides of the crosswalk and are activated either by a pedestrian push-button or an automated detection system. Once triggered, the lights flash at a constant rate for a preset duration, alerting drivers to the presence of a pedestrian. Advanced detection technology can extend the flashing duration to accommodate slower pedestrians, ensuring they have adequate time to cross safely. Nighttime pedestrian fatalities remain a significant challenge, as many conventional safety measures do not improve visibility. While the **National Highway Traffic Safety Administration (NHTSA)** reported a 15% decrease in pedestrian fatalities from 1994 to 2004, recent studies emphasize the need for continued research to optimize in-pavement warning light systems. One key concern is whether frequent drivers at these crosswalks may become overly reliant on the flashing lights rather than actively scanning for pedestrians. This study aims to fill key research gaps regarding in-pavement warning light systems by focusing on the Assess the effectiveness of different in-pavement warning light configurations, including those with advanced signage and raised crosswalks, through a case study analysis.and to examine driver scanning behavior at midblock crosswalks to determine whether the presence of in-pavement lights influences drivers' visual attention to pedestrians.This study is specifically focused on evaluating the impact of in-pavement warning light systems on pedestrian safety. Other crosswalk safety measures, including alternative pedestrian treatments, are beyond the scope of this research. The primary goal is to determine how these systems improve pedestrian visibility, influence driver behavior, and enhance overall roadway safety.

THE EFFECTIVENESS OF THE CAPACITY DEVELOPMENT TRAINING PROGRAM OF VCDRRMO TOWARDS ENHANCING COMMUNITY RESILIENCE

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Valenzuela City is one of the first class highly urbanized cities, located in the National Capital Region of the Philippines; however, it is still prone to natural calamities and man-made hazards. The city has faced numerous challenges when it comes to natural disasters, perhaps because of its geographical and climatic conditions. One of the biggest dilemmas of the community members is flooding, exacerbated by seasonal typhoons and monsoons, fire and other man-made hazards. Thus, in accordance with the mandate of Republic Act 10121 or the “Philippine Disaster Risk Reduction and Management Act of 2010”, Valenzuela City established its Disaster Risk Reduction Management Office (DRRMO). But the researchers believe that extensive efforts are still deemed necessary to further enhance the resiliency of the city, specifically, through capacity development training program. Based on this, the study will assess the most effective means of VCDRRMO in transferring and sharing their knowledge and skills to the community. The research also believes that the existing capacity development training programs of VCDRRMO could still be improved that is best suitable to the needs of every individual and the

whole community when it comes to disaster. Hence, the study will also focus on evaluating the challenges that affects the effectiveness of capacity development training program of VCDRRMO. Moreover, this paper seeks to understand the perceptions of the residents to the effectiveness of the capacity development training program of VCDRRMO in enhancing community resilience. Lastly, through this, the researchers aim to develop a program that can enhance the existing disaster response strategies within Valenzuela City. This study could be utilized to advance even more the system of Valenzuela City when it comes to disaster-related issues because only a few to none studies and literature focus on the importance of capacity development training program when it comes to making the communities resilient in facing a disaster. Hence, this paper will offer a significant information on the effectiveness of the trained individuals, the citizens, and especially the training programs in enhancing the resiliency of the community.

CUSTOMER SATISFACTION FROM THE SERVICES PROVIDED BY THE NATIONALISED BANKS AND PRIVATE BANKS

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In the banking industry, customer happiness is vital since it affects both brand loyalty and client retention. By examining important service factors like responsiveness, dependability, convenience, and technological improvements, this study seeks to evaluate the levels of customer satisfaction between nationalized and private banks. Customers looking for stability and government-backed security frequently choose nationalized banks because of their reputation for reliability and wide branch networks. They might, however, fall behind in terms of digital infrastructure and service speed. Private banks, on the other hand, prioritize individualized support, cutting-edge digital banking solutions, and customer-centric services, which leads to increased convenience and efficiency. The study looks at things like transaction ease, grievance redressal procedures, customer service quality, and digital banking experiences in both industries. This study evaluates the relationship between service expectations and overall satisfaction using surveys and customer feedback analysis. Nationalized banks maintain client loyalty because of their legitimacy and reduced service fees, even though private banks typically outperform in responsiveness and innovation. The results show that customer happiness is influenced by customer interaction tactics and service effectiveness

rather than just bank ownership. The report ends with suggestions for both banking industries to improve customer connections, close expectations gaps, and improve service performance. By being aware of these characteristics, banks can better customize their offerings to build enduring client pleasure and trust.

CLIMATE CHANGE AND ITS IMPACT ON PLANT BIODIVERSITY: CHALLENGES AND SOLUTIONS

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Climate change is one of the most significant global challenges, posing a severe threat to plant biodiversity. Rising temperatures, erratic rainfall patterns, increased frequency of extreme weather events, and habitat loss are causing shifts in plant distribution, changes in phenology, and even species extinction. This paper explores the impact of climate change on plant biodiversity, highlighting key challenges and proposing potential solutions for conservation and sustainable management. The study examines how temperature rise affects plant physiology, growth, and reproduction, leading to alterations in ecosystem dynamics. Changes in precipitation patterns contribute to drought stress, water scarcity, and soil degradation, negatively impacting plant health and survival. Furthermore, the increasing concentration of greenhouse gases influences photosynthesis, nutrient cycling, and plant-pollinator interactions, ultimately affecting biodiversity at multiple levels. Species that fail to adapt to changing climatic conditions face the risk of migration or extinction, disrupting ecological balance and agricultural productivity. Addressing these challenges requires a multifaceted approach. Conservation strategies such as afforestation, habitat restoration, and the establishment of protected areas can help preserve plant biodiversity. The role of biotechnology, including genetic modification and seed banks, is crucial in developing climate-resilient plant species. Additionally, sustainable agricultural practices, such as agroforestry, organic farming, and water conservation techniques, can mitigate the adverse effects of climate change on crops and wild plant species. Community participation, indigenous knowledge, and policy interventions play a vital role in fostering resilience and ensuring the long-term sustainability of plant ecosystems. This paper emphasizes the urgency of global cooperation in mitigating climate change and implementing adaptation strategies to protect plant biodiversity. Strengthening research, promoting environmental awareness, and integrating traditional ecological knowledge with modern conservation techniques are essential steps toward

sustainable biodiversity management. By adopting proactive measures, we can safeguard plant species, ensure ecosystem stability, and secure the future of global biodiversity in the face of climate change.

ADVANCED SPECTROSCOPIC TECHNIQUES FOR THE ANALYSIS OF HEAVY METALS IN GROUNDWATER

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Groundwater contamination by heavy metals is a significant environmental concern due to its adverse effects on human health and ecosystems. The presence of toxic metals such as arsenic (As), lead (Pb), cadmium (Cd), chromium (Cr), and mercury (Hg) in groundwater necessitates accurate and efficient analytical techniques for their detection and quantification. Traditional methods for heavy metal analysis, such as atomic absorption spectrometry (AAS) and inductively coupled plasma mass spectrometry (ICP-MS), have evolved with advancements in spectroscopic techniques to enhance sensitivity, accuracy, and detection limits. This paper provides a comprehensive review of advanced spectroscopic techniques used for the analysis of heavy metals in groundwater. The study focuses on key techniques, including Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), X-ray Fluorescence (XRF) Spectroscopy, Laser-Induced Breakdown Spectroscopy (LIBS), and Fourier Transform Infrared (FTIR) Spectroscopy. Each method is discussed in terms of its working principle, detection limits, advantages, and limitations in groundwater analysis. ICP-MS and ICP-OES offer high sensitivity and precision, making them ideal for trace metal detection. XRF is a rapid and non-destructive technique, suitable for on-site analysis, while LIBS provides real-time multi-elemental detection with minimal sample preparation. FTIR spectroscopy, though primarily used for organic compounds, is gaining attention for metal-ligand interaction studies in groundwater. The review also explores recent advancements such as nanomaterial-assisted spectroscopy, portable spectroscopic devices for in-field analysis, and artificial intelligence (AI)-driven spectroscopic data interpretation, which enhance the efficiency and applicability of these techniques. Additionally, challenges related to sample preparation, interferences, and cost-effectiveness are discussed, along with potential solutions for improving accuracy and reproducibility in groundwater monitoring. Overall, this paper highlights the significance of advanced spectroscopic techniques in ensuring the safe and sustainable management of groundwater resources. The integration of cutting-edge technologies in spectroscopic analysis

presents new opportunities for real-time monitoring and early detection of heavy metal contamination, facilitating better environmental management strategies and public health protection.

BEHAVIORAL ANALYSIS OF CONCRETE TUNNEL SYSTEMS UNDER FAULT-INDUCED DISPLACEMENT

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Tunneling is a vital industry, supporting underground transportation infrastructure and essential utility systems. In seismically active regions, such as California, tunnels often intersect faults, making them susceptible to both dynamic earthquake loading and significant fault-induced displacements. This interaction poses challenges related to stability, strength, and serviceability, as the tunnel structure deforms with the fault, potentially causing severe damage to the concrete liner. While tunnels are constructed using various methods—cut-and-cover, immersed, and bored tunneling—the latter is of primary concern in this study due to its vulnerability to fault displacement. To model tunnel-fault interactions, this research employs **Finite Element Analysis (FEA)** using **ANSYS** Workbench, incorporating the **Mohr-Coulomb constitutive law** for geotechnical materials and the **Hognestad (1951) material model** for concrete nonlinearity. A fault is a fracture in the Earth's crust where relative movement occurs between rock masses on either side of the discontinuity. This movement can be gradual, as rocks slowly deform over time, or sudden, leading to an earthquake when the fault ruptures. In regions of repeated faulting, fault zones develop instead of a single discrete break, consisting of multiple parallel or branching faults that separate masses of broken rock, with wider fault zones generally experiencing greater displacement. The total movement of a fault, known as net slip, consists of two components: strike-slip, representing lateral movement, and dip-slip, representing vertical displacement.Faults are simulated as discrete planes with concentrated deformation and as zones of varying widths to account for distributed displacement effects. Since strike-slip fault movements impose the greatest stresses on tunnel liners, this research focuses on their impact. To mitigate damage, an articulated tunnel liner design with flexible joints is investigated, examining different joint orientations, lengths, and relative stiffness's. The objective is

to assess the effectiveness of this design in reducing tunnel liner stresses and damage, thereby improving the resilience of tunnel systems in fault-prone regions.

ENABLING FINANCIAL INCLUSIVITY: ISSUES AND CHALLENGES IN THE ADOPTION AND IMPLEMENTATION OF QR PH IN VALENZUELA CITY

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The Philippines firmly recognized the importance of digitalization as an instigating factor in enabling greater financial inclusivity and addressing the persisting socio-economic disparity between social classes. Thus, due to the recent empirical results indicating a significant correlation between the use of digital payment methods and financial inclusivity, various government instrumentalities in the Philippines committed to formulating and implementing initiatives to digitalize payment systems in the country. Implementing the National QR Code Standard (QR Ph) became one of the most crucial steps in the nation's pursuit of financial inclusivity. However, the goal of realizing greater financial inclusivity with the help of QR Ph remained a considerably challenging task due to the existing issues and challenges that hindered its full adoption and implementation. Despite the positive impact on financial

inclusivity, numerousmarket vendors remained non-participants in the QR Ph initiative. Therefore, this study analyzed the current status of QR Ph implementation and its impact on the working conditions of market vendors. Moreover, it also sought to concretely identify and assess the hindrances that impeded the complete adoption and implementation of QR Ph from the perspectives of both the market vendors and policy implementers within Valenzuela City. The importance of this study lay in its objective to produce a robust network of empirical insights on the discourse regarding the QR Ph implementation. In addition, the findings of this study resulted in the extraction of relevant data with significant implications that aided the researchers in formulating policy enhancement recommendations to strengthen and empower the utilization of QR Ph in grassroots communities and ultimately contributed as an enabling factor in instigating greater financial inclusivity in Valenzuela City.

STRUCTURAL ANALYSIS OF REINFORCEDCONCRETE (R.C) FRAME SYSTEMS

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This study focuses on analyzing the lateral load behavior of reinforced concrte (RCC) frame structures to identify the most vulnerable parts of existing buildings in seismic zones of india.the findings aim to assist structural designers in addressing potential failures caused by inadequate stengthening.The research highlights the importance of desighing structural members to withstand seismic hazards from the outset. Non -linear analysis plays a vital role in the structural design and assessment of reinforced concrete elements. In this study ,pushover analysis of RCC frames is performed using the **SAP2000** software through a displacement -controlled method. internal forces and deformations at the large displacement are evaluted to estimate inelastic stength and deformation demands.which are then compared with the available capacities to ensure performance compliance .A pushover curve is generated,plotting the relationship between base shear and roof displacement ,offering valuable insights into the performance points and hinge locations at various stages of the analysis.

EMPOWERING WOMEN AND PRESERVING CULTURE

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Throughout history, women have played an essential role in shaping and preserving culture. This paper looks at how enabling women can not only help safeguard cultural traditions but also push for social progress. When women are given equal opportunities and access to education, they actively engage with their communities. They contribute to preserving language, art, music, and traditional practices, ensuring these are passed down to future generations. This paper talks about how when we enable women through education, getting their own income, and stepping up into leadership roles, it allows them to protect and celebrate cultural values. When women are strong and independent, they not only help keep cultural traditions alive but also push back against old social norms that hold progress back. The paper shares real stories of women who have done an amazing job of preserving their cultural heritage while also promoting gender equality. From women running create cooperatives to those bringing traditional art forms back to life, their influence is truly impressive. Moreover, this paper dives into how cultural preservation and enabling women go hand in hand. When women have a say in the decision-making process, they're able to shape cultural practices to align with today's values while keeping their core intact. Women often are a bridge between tradition and modernity, striking a balance between maintaining cultural identity and accepting necessary change. It also emphasizes the obstacles that women face when it comes to preserving culture, like not having enough resources, facing gender discrimination, and dealing with pushback from conservative groups. But even with these challenges, enabled women have shown incredible resilience and creativity in finding ways to overcome them. Their contributions through storytelling, folk music, and traditional practices play a essential role in keeping cultural identity bright. This research argues that enabling women isn't just about achieving gender equality; it's also super important for keeping our cultural diversity and identity intact. When we really listen to women and value their voices, communities grow stronger, and we do a better job of protecting our traditions. So, this paper wraps it up by saying that enabling women and preserving culture go hand in hand, and backing women's leadership is important if we want to keep our cultural heritage alive in today's world. The goal here is to spark action by showing how connected women's enablement is to cultural preservation, urging policymakers and communities to support women leaders for a future that's both culturally rich and equal.

ADVANCED SPECTROSCOPIC TECHNIQUES FOR THE ANALYSIS OF HEAVY METALS IN GROUNDWATER

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The contamination of groundwater by heavy metals poses a significant environmental and public health concern worldwide. The presence of toxic metals such as lead (Pb), arsenic (As), cadmium (Cd), mercury (Hg), and chromium (Cr) in groundwater can result from both natural and anthropogenic activities, including industrial discharge, mining, agricultural runoff, and improper waste disposal. Accurate detection and quantification of these heavy metals are essential for assessing water quality and mitigating health risks. Advanced spectroscopic techniques have emerged as powerful analytical tools for detecting trace levels of heavy metals in groundwater with high sensitivity, selectivity, and accuracy. This paper explores the application of various advanced spectroscopic techniques, including Atomic Absorption Spectroscopy (AAS), Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), X-ray Fluorescence (XRF), and Laser-Induced Breakdown Spectroscopy (LIBS), for the qualitative and quantitative analysis of heavy metals in groundwater. Each technique offers distinct advantages in terms of detection limits, precision, and sample preparation requirements. AAS is widely used due to its cost-effectiveness and reliable metal detection capabilities, while ICP-OES and ICP-MS provide superior multi-elemental analysis with ultra-trace detection limits. XRF is advantageous for rapid, non-destructive analysis, and LIBS enables real-time field measurements without extensive sample preparation. This study highlights the principles, methodologies, and comparative effectiveness of these spectroscopic techniques in detecting heavy metals in groundwater. The paper also discusses recent advancements, challenges, and future prospects of spectroscopic methods in environmental monitoring. The integration of novel approaches, such as portable spectrometers, machine learning algorithms for spectral interpretation, and nanomaterial-based sensors, has further enhanced the analytical capabilities of spectroscopic techniques. The findings underscore the critical role of advanced spectroscopic methods in ensuring water quality monitoring, regulatory compliance, and environmental sustainability. By leveraging these techniques, researchers and policymakers can develop effective strategies for groundwater protection and contamination remediation, ultimately safeguarding public health and ecological balance.

PHYSIOLOGICAL ADAPTATIONS OF DESERT FAUNA: A CASE STUDY OF CAMEL

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Desert environments pose extreme challenges to survival due to high temperatures, scarce water availability, and nutrient limitations. Among desert fauna, the camel (*Camelus dromedarius*) exhibits remarkable physiological adaptations that enable it to thrive in these harsh conditions. This study explores the key adaptive mechanisms of camels, including water conservation, thermoregulation, and metabolic adjustments, which contribute to their survival in arid regions. One of the most significant adaptations of camels is their ability to withstand prolonged periods of dehydration without severe physiological consequences. Unlike other mammals, camels can lose up to 25% of their body water without experiencing fatal dehydration. This is achieved through efficient water retention mechanisms such as concentrated urine, minimal sweating, and the ability to rehydrate rapidly without osmotic imbalance. Their red blood cells are uniquely oval-shaped, allowing them to maintain blood flow even under extreme dehydration conditions. Thermoregulation is another crucial adaptation, as camels can tolerate body temperature fluctuations ranging from 34°C to 41°C, reducing the need for excessive water loss through sweating. Additionally, their thick fur provides insulation, minimizing heat absorption during the day and retaining warmth at night. Behavioral adaptations, such as resting in shaded areas and facing the sun to minimize exposure, further enhance their ability to conserve energy and moisture. Metabolically, camels can derive water from fat oxidation stored in their hump, which serves as a crucial energy reservoir during food scarcity. Their digestive system is highly efficient in extracting nutrients from fibrous desert plants, and they can withstand high salt concentrations in water sources that would be toxic to other animals. Furthermore, their nasal passages contain specialized structures that minimize water loss during respiration. Understanding these physiological adaptations is essential for improving camel breeding programs, livestock management in arid regions, and conservation efforts. Additionally, insights gained from camel physiology can contribute to biomedical research, particularly in areas related to dehydration resistance and metabolic efficiency. This study highlights the evolutionary significance of camels as a model organism for desert survival, emphasizing their role in sustaining human livelihoods and ecological balance in arid environments.

THE ROLE OF NANOTECHNOLOGY IN MODERN PHYSICS: APPLICATIONS AND FUTURE PROSPECTS

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Nanotechnology has revolutionized modern physics by enabling the manipulation of matter at the atomic and molecular scale, leading to groundbreaking advancements in various scientific and industrial domains. This paper explores the critical role of nanotechnology in modern physics, focusing on its fundamental principles, current applications, and future prospects. At its core, nanotechnology operates on the quantum scale, where classical physics transitions to quantum mechanics. Understanding nanoscale interactions has led to the development of novel materials, such as graphene and carbon nanotubes, with extraordinary mechanical, electrical, and thermal properties. These materials have paved the way for advancements in electronics, energy storage, and biomedical applications. One of the most significant contributions of nanotechnology to modern physics is in the field of nanoelectronics, where transistors and semiconductors are being miniaturized to enhance computational efficiency. Quantum dots and nanophotonics have transformed optical communication and imaging technologies, leading to high-resolution displays and advanced sensors. Furthermore, nanotechnology has greatly influenced materials science, with innovations such as self-healing materials and ultralight yet super-strong composites. In energy research, nanotechnology has enabled the development of high-efficiency solar cells, energy-harvesting nanogenerators, and next-generation batteries with enhanced capacity and longevity. The biomedical sector has also benefited immensely from nanophysics, with applications in targeted drug delivery, cancer treatment, and biosensors for early disease detection. Despite these advancements, challenges remain in the large-scale production of nanomaterials, potential environmental risks, and ethical considerations associated with nanotechnology. Future prospects include the integration of nanotechnology with artificial intelligence, the development of quantum computing devices, and the exploration of nanorobotics for medical and industrial applications. In conclusion, nanotechnology continues to shape modern physics by bridging the gap between fundamental scientific discoveries and technological innovations. As research progresses, its role in transforming various industries and enhancing our understanding of physical phenomena will only expand, making it a crucial area of study in the 21st century.

IMPACT OF CLIMATE CHANGE ON PLANT BIODIVERSITY AND ECOSYSTEM SERVICES

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Climate change is a significant global challenge that profoundly impacts plant biodiversity and ecosystem services. Rising temperatures, altered precipitation patterns, increased frequency of extreme weather events, and elevated atmospheric CO_2 levels are reshaping plant communities, threatening species diversity, and disrupting ecological functions. This paper explores the complex relationship between climate change and plant biodiversity, focusing on the mechanisms driving species adaptation, migration, and extinction. One of the primary consequences of climate change is shifts in species distribution, as plants migrate toward higher altitudes and latitudes in search of suitable climatic conditions. However, habitat fragmentation and slow reproductive cycles limit the adaptability of many species, leading to biodiversity loss. Changes in phenology, such as altered flowering and fruiting times, disrupt pollination networks and ecological interactions, affecting both flora and fauna. Additionally, increased temperatures and prolonged droughts contribute to forest degradation, desertification, and reduced agricultural productivity. Ecosystem services, which are vital for human well-being, are also at risk due to climate-induced changes in plant biodiversity. Forests, wetlands, and grasslands play a crucial role in carbon sequestration, water regulation, soil stabilization, and climate moderation. The decline of plant species richness can weaken these ecosystem functions, leading to reduced resilience against environmental stressors. Furthermore, the loss of medicinal plants, food crops, and culturally significant species impacts local communities and indigenous knowledge systems. To mitigate the adverse effects of climate change on plant biodiversity and ecosystem services, conservation strategies such as afforestation, habitat restoration, and the implementation of climate-resilient agricultural practices are essential. Additionally, integrating traditional ecological knowledge with modern scientific approaches can enhance conservation efforts. This paper highlights the urgency of policy interventions and collaborative global efforts to preserve plant biodiversity and sustain the ecosystem services that support life on Earth.

THE REVOLT OF 1857: A MUTINY OR THE FIRST WAR OF INDEPENDENCE

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The Revolt of 1857 remains one of the most debated events in Indian history. While British historians termed it a mere military mutiny, Indian nationalists have regarded it as the First War of Independence. This paper critically examines the causes, nature, and consequences of the uprising, analyzing whether it was a spontaneous rebellion or a well-planned struggle for independence. The revolt was triggered by political, economic, social, and religious discontent among Indians, particularly sepoys in the British East India Company's army. The introduction of the Enfield rifle, rumored to use cartridges greased with cow and pig fat, acted as an immediate catalyst, inflaming religious sentiments. However, deeper grievances included exploitative economic policies, land annexations, and social reforms that disrupted traditional Indian society. The uprising, which began in Meerut on May 10, 1857, quickly spread to major cities such as Delhi, Kanpur, Lucknow, and Jhansi. Leaders like Bahadur Shah II, Rani Lakshmibai, Nana Sahib, and Tantia Tope emerged as prominent figures, rallying diverse groups against British rule. While some argue that the lack of a unified national vision and regional fragmentation weakened the movement, others emphasize its significance as the first large-scale attempt to overthrow colonial rule. The British response was swift and brutal, with widespread suppression, mass executions, and structural changes in governance. The revolt ultimately led to the dissolution of the East India Company and the direct control of India by the British Crown. Although unsuccessful in achieving independence, it sowed the seeds of nationalism, influencing later freedom movements. By analyzing historical sources and perspectives, this paper argues that while the revolt may have started as a mutiny, its widespread participation, leadership, and anti-colonial sentiments justify its recognition as India's First War of Independence. The uprising was not just a reactionary conflict but a significant event that laid the foundation for India's eventual struggle for freedom.

WORLD WAR II AND THE DECOLONIZATION OF ASIA AND AFRICA

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World War II (1939–1945) was a turning point in global history, not only for its military and political consequences but also for its profound impact on the process of decolonization in Asia and Africa. The war weakened European colonial powers, both economically and militarily, making it increasingly difficult for them to maintain their overseas territories. The ideological shift towards self-determination, as emphasized in the Atlantic Charter (1941), further fueled nationalist movements across colonized regions. In Asia, the war accelerated independence struggles, particularly in India, Burma, Indonesia, and Vietnam. The British, French, and Dutch colonial administrations faced strong resistance from nationalist leaders who leveraged wartime instability to advance their demands for self-rule. Japan's occupation of several Asian territories demonstrated the vulnerability of European powers, further emboldening independence movements. Following the war, the British withdrew from India in 1947, leading to the partition of India and Pakistan, while Indonesia and Vietnam engaged in conflicts with the Dutch and French, respectively, to achieve independence. Similarly, in Africa, World War II exposed the contradictions of colonial rule. African soldiers who fought for European powers returned home with heightened political consciousness, demanding equal rights and self-governance. The economic exploitation of African colonies to support the war effort intensified local grievances. The emergence of Pan-Africanism and the founding of the United Nations (1945), with its emphasis on self-determination, further strengthened the case for decolonization. The subsequent decades saw the rapid dissolution of European empires, beginning with Ghana's independence in 1957 and followed by the decolonization of numerous African nations in the 1960s. This paper explores how World War II directly influenced the decolonization of Asia and Africa by weakening colonial powers, inspiring nationalist movements, and creating a new international framework supportive of independence. It also examines the role of key leaders, movements, and geopolitical shifts that contributed to the post-war wave of decolonization. Understanding this historical transition is essential to comprehending the political and economic development of former colonies in the modern era.

SOCIAL MEDIA ADDICTION: CAUSES, IMPACT, AND STRATEGIES FOR DIGITAL WELL-BEING

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Social media has become an integral part of modern life, revolutionizing communication, entertainment, and information sharing. However, excessive use has led to a growing concern: social media addiction. This paper explores the psychological, behavioral, and social dimensions of social media addiction, analyzing its causes, symptoms, and potential consequences. The study delves into the addictive nature of social media platforms, driven by algorithms designed to maximize user engagement. Features such as infinite scrolling, notifications, likes, and shares contribute to compulsive usage, triggering dopamine release in the brain, similar to substance addiction. Psychological factors like low self-esteem, loneliness, anxiety, and the fear of missing out (FOMO) further exacerbate dependence on these platforms. The research examines the impact of social media addiction on mental health, productivity, and interpersonal relationships. Excessive usage is linked to depression, anxiety, sleep disorders, and reduced academic or workplace performance. Moreover, over-reliance on virtual interactions can weaken real-world relationships, leading to social isolation. The study also highlights demographic trends, showing that adolescents and young adults are particularly vulnerable due to their high engagement with digital technology. To address this growing issue, the paper discusses various intervention strategies, including digital detox programs, self-regulation techniques, and awareness campaigns. The role of educational institutions, policymakers, and mental health professionals in mitigating the effects of social media addiction is also emphasized. Furthermore, the study suggests responsible platform design, such as limiting screen time, incorporating mindful usage reminders, and promoting healthier digital habits. This research contributes to the existing literature by providing a comprehensive analysis of social media addiction and its implications on individuals and society. Understanding the underlying psychological mechanisms and societal impact can help develop effective strategies for responsible social media usage. Ultimately, fostering digital well-being is crucial in maintaining a balanced relationship with technology while preserving mental and emotional health.

IMPACT OF CLIMATE CHANGE ON PHOTOSYNTHESIS AND PLANT PRODUCTIVITY

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Climate change is one of the most significant challenges affecting global agriculture and ecosystems. Rising temperatures, elevated carbon dioxide (CO_2) levels, and unpredictable precipitation patterns are altering plant physiological processes, particularly photosynthesis, which directly influences plant growth and productivity. This study examines how climate change impacts photosynthetic efficiency and crop yields, considering factors such as temperature stress, water availability, and atmospheric CO_2 concentration. Elevated CO_2 levels generally enhance the rate of photosynthesis in C_3 plants like wheat and rice due to increased carbon fixation. However, the benefits are often offset by other climate-induced stresses, including heat stress, water scarcity, and nutrient limitations. High temperatures can disrupt the photosynthetic apparatus, leading to reduced enzyme activity, increased photorespiration, and oxidative stress, ultimately decreasing plant productivity. Additionally, erratic rainfall patterns contribute to drought conditions, limiting water availability for photosynthesis and causing stomatal closure, which reduces carbon intake and transpiration cooling. In contrast, excessive rainfall can lead to water logging, oxygen deficiency in roots, and hindered nutrient uptake, further compromising plant growth. Climate change also alters the balance between C_3 and C_4 plant species. C_4 plants, such as maize and sugarcane, exhibit higher efficiency under high-temperature conditions due to their specialized carbon-concentrating mechanisms. However, their productivity can also decline if extreme temperatures exceed their physiological limits. Furthermore, climate change influences the timing and intensity of plant phenological events such as flowering and fruiting, disrupting agricultural cycles and food security. To mitigate these adverse effects, adaptive strategies such as developing climate-resilient crop varieties, optimizing irrigation practices, and employing precision agriculture technologies are essential. Genetic engineering and breeding techniques can enhance plant tolerance to heat and drought stress, while sustainable agricultural practices like agro forestry and conservation tillage help improve soil moisture retention and carbon sequestration. In conclusion, while increased CO_2 may initially boost photosynthetic activity in some plants, the combined effects of temperature rise, water stress, and environmental changes pose serious threats to global plant productivity. Urgent research and policy interventions are needed to develop sustainable solutions for ensuring agricultural resilience in the face of climate change.

MULTIFACETED USES OF RUDRAKSHA: SPIRITUAL, MEDICINAL, AND SCIENTIFIC PERSPECTIVES

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Rudraksha, the sacred seed derived from the *Elaeocarpus ganitrus* tree, has been revered in various cultures, particularly in Hinduism and Buddhism, for its spiritual, medicinal, and scientific significance. This paper explores the diverse uses of Rudraksha, examining its religious, therapeutic, and scientific applications. Traditionally, Rudraksha has been used in meditation and spiritual practices, believed to enhance concentration, reduce stress, and provide a sense of tranquility. In Ayurveda and traditional medicine, it is credited with healing properties, including the regulation of blood pressure, improvement of mental health, and enhancement of the immune system. The bioelectric and electromagnetic properties of Rudraksha have also attracted scientific research, which suggests its potential benefits in stabilizing the human nervous system and improving overall well-being. Beyond spiritual and health-related aspects, Rudraksha is utilized in various forms of jewelry and ornaments, contributing to the handicraft and wellness industries. The classification of Rudraksha is based on the number of mukhis (facets) present on the seed, each of which is associated with distinct spiritual and physiological benefits. Studies on Rudraksha's dielectric and inductive properties indicate its effectiveness in maintaining a bio-energy balance, making it a subject of interest in alternative therapies. This paper also highlights the conservation challenges faced by Rudraksha trees due to deforestation and overharvesting. Sustainable cultivation and ethical trade practices are essential for preserving this valuable resource for future generations. The study emphasizes the need for further interdisciplinary research to validate the traditional claims scientifically and promote the sustainable use of Rudraksha in various fields. By analyzing the historical, cultural, medical, and scientific aspects of Rudraksha, this paper aims to provide a comprehensive understanding of its significance and potential benefits, encouraging deeper exploration and integration into contemporary wellness practices.

EXPANSIVE SOIL STABILIZATION USING RED MUD AND IRON POWDER

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The stability of soil is crucial in supporting structures and ensuring effective load distribution. However, expansive soils, such as Black Cotton Soil, pose significant challenges due to their tendency to undergo excessive swelling and shrinkage, primarily caused by the presence of montmorillonite minerals. These volume changes can lead to structural issues such as settlement and cracking. To mitigate these problems, soil stabilization techniques are employed to enhance the engineering properties of the soil, improving its strength and durability.This study explores the stabilization of Black Cotton Soil using red mud and iron powder as stabilizing agents. Different proportions of iron powder were blended with untreated soil to determine the optimal mix for effective soil stabilization. A series of laboratory tests, including Atterberg's limits, compaction tests, and California Bearing Ratio (CBR) tests, were conducted under both soaked and unsoaked conditions. The results showed notable improvements in Maximum Dry Density and CBR values with the addition of red mud and iron powder. The study examined various mix ratios, including 0%, (9% red mud + 1% iron powder) = 10%, (18% + 2%) = 20%, (27% + 3%) = 30%, (36% + 4%) = 40%, and (45% + 5%) = 50%. The findings suggest that red mud and iron powder can effectively enhance the load-bearing capacity and stability of expansive soils, making them viable alternatives for soil improvement in construction applications.

ENVIRONMENTAL POLLUTION: CAUSES, EFFECTS, AND SUSTAINABLE SOLUTIONS

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Environmental pollution has become a critical global issue, affecting ecosystems, human health, and economic stability. This paper explores the major sources of pollution, including air, water, soil, and noise pollution, emphasizing their impact on the environment and living organisms. Industrialization, urbanization, deforestation, and excessive use of non-renewable resources have significantly contributed to the degradation of natural ecosystems. Air pollution, primarily caused

by vehicular emissions, industrial discharges, and deforestation, has led to severe health issues such as respiratory diseases, cardiovascular disorders, and climate change. Water pollution, resulting from industrial waste, agricultural runoff, and plastic disposal, has contaminated freshwater sources, threatening aquatic life and human consumption. Soil pollution due to excessive use of pesticides, chemical fertilizers, and improper waste disposal has degraded land quality, affecting agriculture and food security. Additionally, noise pollution from traffic, construction, and industrial activities has led to increased stress levels, hearing impairments, and reduced productivity. The consequences of environmental pollution are alarming, with biodiversity loss, global warming, ozone layer depletion, and increased natural disasters becoming more frequent. The paper highlights the need for sustainable solutions, including stricter environmental regulations, adoption of renewable energy sources, efficient waste management, afforestation, and public awareness programs. The role of technology in pollution control, such as air and water purification systems, green infrastructure, and eco-friendly alternatives, is also discussed. Furthermore, this study emphasizes the significance of individual and collective responsibility in mitigating pollution. Governments, industries, and communities must collaborate to implement policies that promote environmental sustainability. Education and awareness campaigns can encourage eco-friendly practices among individuals, fostering a culture of conservation and responsible consumption. In conclusion, environmental pollution is a pressing challenge that requires immediate attention and strategic actions to ensure a sustainable future. By integrating scientific advancements, policy frameworks, and community participation, it is possible to mitigate pollution and restore ecological balance. This paper aims to provide valuable insights for researchers, policymakers, and environmentalists to develop effective strategies for pollution control and environmental sustainability.

IMPACT OF INDUSTRIAL EFFLUENTS ON SOIL AND WATER QUALITY: A CASE STUDY

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Industrialization plays a crucial role in economic development, but it also leads to significant environmental concerns, particularly the contamination of soil and water resources. This study investigates the impact of industrial effluents on soil and water quality, focusing on a specific case study area. The research aims to analyze the physicochemical characteristics of soil and water samples collected from industrial

zones and their surrounding regions. Various parameters, including pH, electrical conductivity, total dissolved solids (TDS), heavy metals, and biological contaminants, were examined to assess pollution levels. The study reveals that industrial effluents contribute to soil degradation by altering its pH, increasing salinity, and reducing fertility due to the accumulation of toxic metals such as lead (Pb), cadmium (Cd), and chromium (Cr). Similarly, water bodies receiving untreated industrial discharges exhibit increased TDS, biochemical oxygen demand (BOD), and chemical oxygen demand (COD), indicating a decline in water quality. These pollutants pose severe threats to agricultural productivity, aquatic ecosystems, and human health. The findings suggest the urgent need for strict environmental regulations and the adoption of sustainable industrial waste management practices. Implementation of wastewater treatment technologies, periodic monitoring of effluent discharge, and public awareness initiatives can mitigate the adverse effects of industrial pollution. The study also emphasizes the importance of promoting eco-friendly industrial processes to achieve long-term environmental sustainability. This research contributes to the existing knowledge on industrial pollution and serves as a reference for policymakers, environmentalists, and researchers to develop effective pollution control strategies. The case study highlights the pressing need for a balance between industrial growth and environmental conservation to ensure a sustainable future.

SUBVERTING PATRIARCHY: A POSTCOLONIAL FEMINIST READING OF NYASHA'S REBELLION IN TSITSI DANGEREMBGA'S NERVOUS CONDITIONS"

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Tsitsi Dangarembga's *Nervous Conditions* is a significant postcolonial feminist novel that critiques both patriarchal and colonial oppression. While much research has focused on Tambudzai's journey, Nyasha's rebellion remains underexplored. This study addresses this gap by analyzing Nyasha's defiance through a postcolonial feminist lens, examining how her actions challenge patriarchal structures and reveal the psychological effects of oppression. Using postcolonial feminist theory, the research explores her resistance, particularly in her conflicts with Babamukuru and her struggles with identity and autonomy. Nyasha's defiance against authority disrupts

traditional gender norms, highlighting the difficulties women face in asserting independence in oppressive systems. Her mental and physical struggles illustrate the deep psychological consequences of resisting patriarchal and colonial control. By critically engaging with Nyasha's experiences, this study emphasizes the complexities of female resistance in postcolonial societies.

PARTITION OF INDIA (1947): CAUSES, CONSEQUENCES, AND HISTORICAL INTERPRETATIONS

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The Partition of India in 1947 remains one of the most significant and traumatic events in South Asian history. It marked the end of British colonial rule and led to the creation of two independent nations, India and Pakistan. This paper examines the causes, consequences, and historical interpretations of the Partition, highlighting its deep-rooted impact on the socio-political and cultural landscape of the region. The study explores the long-standing religious, political, and economic factors that contributed to the Partition. The demand for Pakistan, championed by the All India Muslim League under Muhammad Ali Jinnah, stemmed from concerns over Muslim political representation and fears of marginalization in a Hindu-majority India. The role of British colonial policies, particularly the divide-and-rule strategy, communal electorates, and hasty withdrawal, further exacerbated tensions. Additionally, ideological differences between the Indian National Congress and the Muslim League played a crucial role in shaping the eventual division. The consequences of Partition were devastating, resulting in one of the largest mass migrations in human history, with an estimated 15 million people displaced and over a million lives lost in communal violence. The newly drawn borders between India and Pakistan fueled animosities, leading to long-term geopolitical conflicts, including wars and territorial disputes over Kashmir. The Partition also had profound cultural and psychological impacts, as families were torn apart, heritage sites were abandoned, and collective memories of trauma continued to influence subsequent generations. Furthermore, this paper delves into the historical interpretations of Partition by scholars and historians. Some view it as an inevitable outcome of religious and political divisions, while others argue that it was a product of colonial manipulation and leadership failures. Recent historiographical debates also focus on the experiences of marginalized groups, such as women and lower-caste communities, who suffered immensely during the violence and displacement. By analyzing the Partition from multiple perspectives, this paper

seeks to provide a comprehensive understanding of one of the most defining moments in South Asian history. The study underscores the importance of learning from the past to foster reconciliation, regional stability, and a deeper appreciation of the shared history between India and Pakistan.

FOREST CONSERVATION: STRATEGIES, CHALLENGES, AND SUSTAINABLE SOLUTIONS FOR ENVIRONMENTAL SUSTAINABILITY

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Forests play a crucial role in maintaining ecological balance, supporting biodiversity, and mitigating climate change. However, rapid deforestation due to urbanization, industrialization, and agricultural expansion has led to severe environmental consequences, including loss of biodiversity, soil degradation, and climate instability. This paper explores the significance of forest conservation, highlighting its impact on environmental sustainability, economic development, and societal well-being. The study emphasizes various conservation strategies, such as afforestation, reforestation, and sustainable forest management, which are essential for maintaining ecological integrity. The role of government policies, international agreements, and community participation in forest conservation is also discussed. Technological advancements, including remote sensing and artificial intelligence, are analyzed for their effectiveness in monitoring and protecting forest ecosystems. Moreover, the paper examines the challenges in forest conservation, including illegal logging, encroachment, and insufficient enforcement of conservation laws. Solutions such as stricter regulations, awareness campaigns, and incentives for sustainable forestry practices are proposed. Additionally, the role of indigenous communities in forest conservation is explored, emphasizing their traditional knowledge and sustainable land management practices. The findings indicate that a multi-stakeholder approach involving government bodies, non-governmental organizations, researchers, and local communities is crucial for successful forest conservation. The paper concludes that effective conservation strategies not only safeguard forests but also contribute to climate change mitigation, water conservation, and overall environmental sustainability. By fostering global cooperation and implementing innovative conservation techniques, forest ecosystems can be preserved for future generations. This study provides valuable insights for policymakers, researchers, and environmentalists to develop and implement comprehensive forest conservation strategies.

IMPORTANCE OF TIME MANAGEMENT TECHNIQUES: A BIRD'S EYE VIEW OF CASCADING IMPACT AND ILL EFFECTS OF PROCRASTINATION HABITS OF BANK EMPLOYEES ON NATIONAL ECONOMY

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The banking sector is vital to any nation's economic growth and development. However, procrastination habits among bank employees can have cascading impacts on the national economy. This study aims to provide a bird's eye view of the importance of time management techniques in reducing procrastination habits among bank employees and its subsequent effects on the national economy. A comprehensive literature review was conducted to identify the causes and consequences of procrastination habits among bank employees. The study reveals that procrastination habits lead to decreased productivity, increased stress, and poor decision-making, affecting the performance of the banking sector. The study explores the importance of using an appropriate time management technique to reduce bank employees' procrastination habits. It dwells upon by strongly advocating the use of some of the famous time management techniques like The Pomodoro technique, The Eisenhower Matrix technique, The Pareto Analysis technique, The Parkinson's Law technique, and The Time-Blocking technique by bank employees regularly to help them reduce their procrastination habits, and improve their overall productivity. The study highlights the significance of addressing procrastination habits among bank employees, not only for the benefit of the individual employees but also for the overall growth and development of the national economy. Banking organizations can use the findings of this study to develop training programs that focus on time management techniques and procrastination reduction strategies. By squarely addressing procrastination habits and menace issues among bank employees, banking organizations can improve their overall productivity, reduce unnecessary costs, and effectively contribute to the growth and sound development of the national economy. Some of the potential and detrimental cascading impacts on the national economy are Decreased National Competitiveness and Economic Ranking, leading to a reduction in foreign investments and trade, Negative Impact on Financial Inclusion and economic inequality, Decreased Tax Revenues to the Governments, Negative Impact on Employment Opportunities, Increased Risk of Financial Instability, Negative Impact on Economic Growth, Decreased Customer Satisfaction, Losses due to missed opportunities and delayed investments, and Reduced Productivity and slow GDP growth of the nation. Procrastination habits have ill effects on the national economy, such as Economic Instability and Reduced Financial Intermediation.

UNDERSTANDING PLANT MORPHOLOGY: STRUCTURE, FUNCTION, AND ADAPTATIONS

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Plant morphology is a fundamental branch of botany that studies the form, structure, and development of plants. It provides essential insights into the classification, evolution, and adaptation of plant species in diverse environmental conditions. This paper explores the key aspects of plant morphology, including external structures such as roots, stems, leaves, flowers, and fruits, as well as their functional significance. Understanding plant morphology is crucial in fields such as agriculture, horticulture, taxonomy, and ecological conservation. The root system, which anchors the plant and absorbs water and nutrients, varies between taproots and fibrous roots, influencing plant stability and resource acquisition. Stems provide mechanical support, transport water and nutrients, and serve as storage organs in some species. Leaves, the primary sites of photosynthesis, exhibit diverse shapes, arrangements, and adaptations based on environmental factors such as light intensity, water availability, and temperature. The reproductive structures of plants, including flowers and fruits, play a crucial role in pollination, seed dispersal, and genetic variation, ensuring species survival. Plant morphology is closely linked to plant physiology and development, with environmental factors influencing morphological variations. The study of plant morphology also aids in understanding evolutionary relationships among species, as structural adaptations reflect phylogenetic trends. Advances in plant morphology, including molecular techniques and digital imaging, have enhanced our ability to analyze plant structures more precisely. This paper also highlights the significance of plant morphology in applied sciences. In agriculture, morphological traits guide crop improvement programs, pest management, and sustainable farming practices. In horticulture, knowledge of plant form is essential for breeding ornamental plants and improving landscape design. Additionally, plant morphology plays a vital role in ecological studies, helping scientists understand plant interactions, competition, and responses to climate change. In conclusion, plant morphology serves as a cornerstone of botanical research, bridging classical taxonomy with modern molecular studies. By exploring the structural diversity of plants, we gain deeper insights into their growth, reproduction, and adaptation. Future research integrating traditional morphological studies with advanced imaging and genetic techniques will further expand our understanding of plant biology, leading to innovations in agriculture, conservation, and environmental sustainability.

A CRITICAL STUDY OF CAUSAL FACTORS AND LEGAL APPROACH TOWARDS JUVENILE CRIMINALITY IN INDIA

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This Paper critically examines the causal factors contributing to juvenile criminality in India and evaluates the effectiveness of the current legal framework in addressing this issue. Juvenile criminality is a serious offense that threatens the social order in any country. Everywhere, there is an increase in juvenile offenses, and young people are increasingly participating in violent crimes. In India, there are comparable trends of an increase in violent crimes committed by children. It is a significant problem for the nation, and it will need careful thought to find a solution. The Indian legal system and court have adjusted some laws pertaining to juvenile justice in India in reaction to these developments. Concerns regarding the efficacy of the current legislative framework under the Juvenile Justice (Care and Protection of Children) Act, 2015, have been raised by the rise in juvenile criminality in India. The purpose of this study is to assess the juvenile justice system's rehabilitative strategy while analyzing trends, causes, and gaps. The results of a mixed-method examination of NCRB data, case studies, and expert interviews show that peer pressure, lack of parental supervision, and socioeconomic circumstances are major contributors to the rise in adolescent crimes, especially in urban areas. According to the report, high recidivism rates are caused by gaps in rehabilitation programs. It comes to the conclusion that, even if the legislative framework emphasizes rehabilitation, effective youth crime reduction requires greater use of education and skill-based interventions as well as community support. There is a need for urgent policy reforms, mental health interventions, and wellstructured reintegration programs to support the affected juveniles.

ORGANIZATIONAL MANAGEMENT: INTEGRATING LEADERSHIP, STRATEGY, AND SUSTAINABILITY IN THE DIGITAL TRANSFORMATION ERA

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This research explores how modern organizations navigate digital transformation while incorporating sustainable business practices. It examines the relationships between leadership styles, strategic decision-making, human resource management (HRM), organizational behavior, and corporate governance. Using a

mixed-methods approach—literature review, interviews with 30 executives, surveys of 60 managers, and 10 case studies—the study identifies key factors influencing organizational effectiveness. Findings highlight that transformational and adaptive leadership, AI-driven decision-making, employee-focused HRM, inclusive workplace culture, and transparent governance with ESG integration significantly enhance performance. The study presents an Integrated Organizational Management Model with five core elements: Adaptive Leadership, Data-Driven Strategy, Human-CenteredHRM, Inclusive Culture, and Governance with Sustainability. A detailed case study of Tata Consultancy Services illustrates these principles in practice, showcasing their impact through initiatives like the "25x25" remote work model, "Business 4.0" digital framework, and carbon neutrality commitment. The research concludes that future organizational management will increasingly emphasize AI adoption, data-centric operations, circular economy models, network-based structures, and human-machine collaboration, providing valuable insights for business leaders adapting to digital transformation.

WORK LIFE BALANCE OF SINGLE WORKING MOTHERS: A SOCIOLOGICAL STUDY

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Single working mothers encounter distinct challenges in managing their professional and family responsibilities, necessitating effective time management, communication skills, and robust support systems to address the demands of both spheres. This analysis highlights critical factors that affect work-life balance, such as socioeconomic status, workplace policies, social support networks, and individual resilience. The results indicate that although many single working mothers experience time limitations, emotional strain, and financial pressures, the implementation of effective coping strategies—such as flexible work arrangements, strong social connections, and self-care routines—can significantly enhance their capacity to juggle work and family obligations. The research underscores the importance of policy reforms, including flexible working hours, accessible childcare options, and mental health resources, to mitigate the difficulties faced by single working mothers. It contributes to sociological discussions by examining the interplay of gender, family dynamics, and employment, advocating for inclusive policies that foster work-life balance and promote social equity.

SACRED EARTH, SACRED WOMEN: ECOFEMINIST NARRATIVES IN INDIAN MOVIES

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Ecofeminism delves into the profound relationship between women and nature, highlighting the ways both are subjected to exploitation by patriarchal and capitalist structures. Ecofeminism remains an important interdisciplinary framework that connects environmental justice with feminist theory. Recent research delves into the intersections of ecofeminism with posthumanism, indigenous knowledge, reproductive health, and political resistance. The most recent papers highlight an increasing emphasis on global perspectives, the involvement of women in environmental activism, and the philosophical foundations of ecofeminism in relation to current social and environmental challenges. Indian cinema has effectively showcased ecofeminist themes through powerful female characters who defend the environment, challenge oppression, and represent the sacred connection between femininity and the natural world. This paper analyzes Hindi films such as Sherni (2021), Kadvi Hawa (2017), Jal (2013), Highway (2014), and NH10 (2015) that embody ecofeminist principles. It also features award-winning short films like Amma Meri (2018) and literary adaptations such as The Hungry Tide by Amitav Ghosh. The study seeks to demonstrate how Indian filmmakers leverage cinema to promote environmental justice and gender equality. As researchers, when we learn about the valuable theory of ecofeminism, it's natural to want to explore it more and share that knowledge for future understanding. In today's technology-driven era, using visual storytelling, like films and other media platforms, is one of the most effective ways to engage people. Since human nature is drawn to interesting and visually appealing content, cinema can be a powerful tool to highlight the connection between women and nature. Women have long been primary caretakers of nature, and they are often the first to feel the effects of natural disasters. Showcasing this relationship through films and media can help raise awareness and make the message more impactful and relatable.

A STUDY ON WORK-LIFE BALANCE AMONG WOMEN EMPLOYEES IN PRIVATE AND PUBLIC SECTOR WITH SPECIAL REFERENCE TO KANNUR DISTRICT

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A crucial aspect of modern work, work-life balance has a big impact on results, job satisfaction, and general well-being. Maintaining a balance between work and personal obligations creates additional challenges for female employees, particularly when they play two roles in the home and at work. Work-life balance is becoming a more important topic as a result of the growing number of women in the workforce, as well as social and professional pressures. The study focused on exploring and gaining better understanding of women employees work life in private and public sector. It also focuses on identifying the work place challenges faced by women employees in their work life balance and the solutions to overcome the challenges. 60 women employees were chosen from Kannur District through convenience sampling technique. The major findings with regard to major challenges were travelling distance from work place to home, long working hours, lack of communication, and lack of team work and so on. Some of the suggestions where Job security should be provided, improve the productivity and eliminate the job stress, be sensitive to women's needs and help them to perform the routine task.Work-life balance policies are most likely to be successfully implemented in organizations for the satisfaction of employees. Thus, this research will form a stepping stone in the process and provide a basis for reflection and debate on work life balance issues.

EXPLORING THE PROBLEMATICS OF NEGOTIATION AND IDENTITY CONSTRUCTION: AN ANALYSIS OF ROMATEARNE'S THE WHITE CITY (2017)

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Global migration has turned more complex in the wake of twenty-first century. The twenty-first century has witnessed unprecedented changes in global politics that contribute to the socio-political dynamism, problematising the notion of diaspora,

migration and the construction of ethno-national identity. Roma Tearne, a British- Sri Lankan Diasporic fiction writer, depicts the predicament of global migration in *The White City* (2017). Set in the backdrop of the terror attack in London on 7th July, 2005, *The White City* (2017), a political dystopia, delves into the perception of an artist who employs art as a mode of articulating her innermost struggle and turmoil. Tearne' s fictions have frequently employed the gaze of a female artist who reinforces Diasporic dilemma through her perception about art. Thus, Tearne's fictions intersect with the personal experiences and the phenomenal global politics on a larger scale. Therefore, my object of analysis is to explore the interface between the 'personal' and the 'political' that lays bare the complexity of diasporic sensibility in *The White City*. Tearne' s kaleidoscopic description of the predicament of the diasporic subject calls into question racial stereotyping, the monopoly of nation-states and ethno-nationalism. Tearne explores the plight of immigrant experiences through the protagonist Hera who epitomises the timelessness of art that aesthetically portrays migration as a process transcending spatio-temporal construct. Thus, *The White City* presents another dimension of diasporic experience from the perspective of an artist. My purpose of study is to situate *The White City*, Tearne's latest novel in the context of the trajectory of Global Migration in today's scenario.

SEBI AS A GUARDIAN OF INVESTORS

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The term Investor Protection is a wide term which covers various measures designed to protect the investors from malpractices of companies, merchant bankers, depository participants and other intermediaries. As the investments have some risks involved, this risk factor should be kept in mind by the investors and they should take all the necessary precautions to protect their interest in the first place. According to the SEBI Act, 1992 Investor protection is 'protecting the interest of the investors in securities and promoting the development of and to regulate the securities market. Protecting investors ensures they are well-informed about their transactions, purchases, and corporate activities, fostering trust and active engagement.The protection of investors from malpractice or broker failures is vital to the securities market, especially while opening trading accounts. It is their confidence that drives financial system stability and growth. SEBI issues public interest advertisements to enlighten investors on the basic features of various instruments and minimum precautions they should take before choosing an investment. SEBI conducts investor

awareness campaigns to educate individuals about their rights and responsibilities in the securities market. This helps investors make informed decisions.SEBI mandates timely and comprehensive disclosures by companies regarding their financial performance, corporate governance, and material developments, empowering investors with crucial information.Rapid changes in technology and market practices require SEBI to continually adapt its policies to address emerging risks effectively. Policymakers play a crucial role in designing and implementing effective solutions to address these challenges. Their expertise in governance, regulatory frameworks, and market dynamics can drive impactful interventions.

IMPACT OF DEMOGRAPHIC FACTORS ON LIFE INSURANCE PREFERENCES: A STUDY OF PRIVATE LIFE INSURANCE COMPANIES IN MADHYA PRADESH

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This research focuses on private insurers and examines how demographic variables influence the choice of life insurance plans by Madhya Pradesh consumers.The study uses a cross-sectional survey with 300 participants, using quantitative techniques like descriptive analysis and chi-square tests to evaluate the correlations between various factors, including age, gender, income, education, occupation, and insurance adoption.The findings show that age and income levels significantly affect product choices: younger populations (20–40 years) and higher-income groups preferred investment-linked policies.However, according to previous studies in Telangana and Jabalpur, gender, educational background, and occupation (e.g., agrarian versus non-agrarian) do not show a statistically significant relationship with awareness or purchase decisions. A striking 72% of respondents exhibited limited awareness of insurance products, primarily attributed to **inadequate agent availability** (31%) and complex documentation processes (7%). Despite Madhya Pradesh's growing urban workforce, rural regions face challenges such as fluctuating incomes and insufficient marketing outreach, with only 28% of aware respondents holding active policies. The study highlights the critical role of **distribution strategies**, emphasizing that tailored marketing and localized agent networks could bridge the gap between insurers and underserved demographics. These insights underscore the

need for private insurers to prioritize **simplified policy structures**, **targeted financial literacy campaigns**, and **rural-centric distribution models** to enhance penetration. The research contributes to regional insurance literature by contextualizing demographic influences in Central India, offering actionable recommendations for insurers to align products with socio-economic realities. Further studies could explore psychographic factors and digital adoption barriers in hybrid urban-rural markets.

FACILITATORS OF PILGRIM SATISFACTION: AN EMPIRICAL STUDY OF BAHU MELA AT BAHU FORT JAMMU

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Bahu Fort is one of the essential locations in Jammu, and it is of enormous religious and spiritual importance. The study's main objective is to investigate the factors that will facilitate pilgrim satisfaction at Bahu Fort during Bahu Mela. Artificial Neural Networks (ANNs) were employed to develop a predictive model to identify the critical predictors of pilgrim satisfaction during the Mela. The model was trained on a comprehensive dataset encompassing various features related to pilgrim experiences, including demographic variables and non-demographic variables. The results of the study found that "Perceived barriers and expectations" is the most influential factor in determining pilgrim satisfaction, followed by "Environmental and experiential quality of the destination" and "Tourists service quality and expectations." This study's findings contribute to improving Mela's overall facilities and costs. The future implications of the study are also discussed.

EXILE AND CRISIS: HINDUPHOBIA, TRAUMA, AND THE KASHMIRI PANDIT EXODUS IN LITERATURE

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The Kashmiri Pandit community, regarded as the oldest surviving indigenous group of the Kashmir region, boasts a rich legacy spanning over two millennia. Renowned for their scholarly contributions across diverse fields of knowledge, they have played a pivotal role in shaping the intellectual and cultural heritage of the Indian

subcontinent (Kaul 2018). The concept of *Hinduphobia*—a term first introduced by Sir Edward Sullivan in 1866 as a critique of J. S. Mill's prejudiced views on Hindu society—has since evolved to denote systemic policies and ideological biases that marginalize or discriminate against Hindus (Sullivan; Truschke). The forced exodus of the Kashmiri Pandits in the early 1990s stands as a stark manifestation of such religious persecution, compelling them to abandon their ancestral homeland and live as what Sudha G. Rajput identifies as *internally displaced persons* within their own country (Rajput 2021). The wave of Islamist militancy that engulfed the Kashmir Valley during this period was not merely an isolated insurgency but rather a culmination of deep-seated majoritarian antagonism, fuelled by religious radicalization and actively abetted by sections of the local population (Pandita 2013). A closer examination of this phenomenon reveals that the violence of the 1990s was not a spontaneous eruption but the final outcome of a long-standing undercurrent of Hinduphobia embedded within Kashmir's socio-political landscape. This latent hostility, which had festered over decades, found implicit endorsement through state policies since the region's controversial accession to India in 1947–48 (Madan; Zutshi). This paper undertakes a critical analysis of select literary texts—both fiction and non-fiction—to trace the historical trajectory of Kashmir's socio-political framework in relation to the Kashmiri Pandit community. By examining narratives of **crisis, displacement, and persecution**, the study seeks to unpack the ideological and policy-driven forces that shaped their marginalization in the post-merger era.

ADVANCING SUSTAINABILITY: A COMPREHENSIVE REVIEW OF GREENHOUSE DRYERS FOR ENVIRONMENTALLY FRIENDLY DRYING SOLUTIONS

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Greenhouse drying is an energy-efficient and Eco-friendly alternative to the traditional drying methods, offering significant benefits in terms of lower energy consumption, enhanced product quality, and minimized adverse environmental impact. This review provides a detail analysis of the most recent developments in greenhouse dryer technologies, their design principles, energy integration tactics, and operational efficiencies. Various alternative energy sources such as solar, biomass etc. are examined for their potential use to enhance the sustainability in greenhouse

drying systems. The study also discusses the latest developments, such as hybrid energy systems, thermal energy storage, and intelligent control mechanisms, which enhances the drying performance. Furthermore, the economic viability, environmental effects, and challenges associated with implementing greenhouse drying solutions are investigated. The analysisidentifies important research gaps and future avenues for developing more efficient and sustainable drying technologies. Incorporation of renewable energy and creative design techniques would make the greenhouse dryers more favorable for eco-friendly agricultural and industrial drying applications.

ADVANCES IN PLANT BREEDING: TECHNIQUES, CHALLENGES, AND FUTURE PROSPECTS

Neha

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Plant breeding has played a crucial role in ensuring global food security by enhancing crop productivity, improving resistance to pests and diseases, and increasing tolerance to environmental stresses. Over the decades, plant breeding has evolved from traditional selection methods to advanced biotechnological approaches. This paper provides an overview of modern plant breeding techniques, their impact on agricultural sustainability, and the challenges associated with their implementation. Conventional breeding methods, such as selection, hybridization, and mutation breeding, have significantly contributed to the development of high-yielding and stress-resistant varieties. However, these techniques are often time-consuming and limited by genetic barriers. The advent of molecular breeding, marker-assisted selection (MAS), and genetic engineering has revolutionized crop improvement by enabling precise genetic modifications. Recent advancements in genome editing technologies, particularly CRISPR-Cas9, have further accelerated the breeding process by allowing targeted gene modifications with high efficiency and accuracy. Despite these advancements, plant breeding faces several challenges, including regulatory hurdles, ethical concerns, and public acceptance of genetically modified (GM) crops. Additionally, climate change and the emergence of new pests and diseases pose significant threats to global agricultural systems, necessitating continuous innovation in breeding strategies. The integration of artificial intelligence (AI) and machine learning (ML) in plant breeding has opened new possibilities for data-driven selection and predictive breeding, enhancing the efficiency of crop improvement programs. This paper also explores the role of participatory breeding, which involves collaboration between scientists and farmers to develop locally

adapted crop varieties. Furthermore, the application of omics technologies, such as genomics, transcriptomics, and metabolomics, has provided deeper insights into plant genetic diversity and trait development. In conclusion, plant breeding remains a cornerstone of agricultural development, with emerging technologies offering new opportunities to address global food security challenges. However, successful implementation requires interdisciplinary collaboration, supportive policies, and public awareness. Future research should focus on integrating biotechnological advancements with sustainable agricultural practices to develop resilient crop varieties that can thrive under changing environmental conditions.

NANO-BASED DRUG DELIVERY SYSTEM: RECENT STRATEGIES FOR THE TREATMENT OF OCULAR DISEASE AND FUTURE PERSPECTIVE

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Nano-based drug delivery systems are now recognized as a viable option to treating eye illnesses, surpassing conventional therapies drawbacks such as low bioavailability and quick drug removal. Nanoparticles that liposomes, dendrimers, and micelles are examples of recent techniques that provide regulated and prolonged medication release while also increasing corneal penetration. These nanocarriers improve treatment efficacy, minimize adverse effects, and increase patient compliance. Advances in nanomaterials and surface modifications improve medication targeting even more. Future perspectives include combining nanotechnology and DNA therapy and individualized medicine to create better and more efficient treatments. Further study will stimulate development in ocular drug delivery, resulting in better therapeutic outcomes.

ANCIENT WATER MANAGEMENT SYSTEMS IN INDIA: A CASE STUDY OF STEPWELLS AND RESERVOIRS

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Water management has been a cornerstone of Indian civilization for thousands of years, with indigenous techniques demonstrating remarkable ingenuity and sustainability. This study explores ancient water management systems in India, focusing on stepwells and reservoirs, which played a crucial role in addressing water scarcity, supporting agriculture, and sustaining urban settlements. These structures, developed in various regions across different dynastic periods, reflect a deep understanding of hydrogeology, architecture, and environmental sustainability. Stepwells, or baoris and vavs, were not only utilitarian structures but also significant cultural and architectural landmarks. Found predominantly in Gujarat, Rajasthan, and Madhya Pradesh, these subterranean water storage systems were designed to recharge groundwater while providing a reliable water source during arid seasons. Reservoirs, including tanks (talaabs) and lakes, were constructed using advanced hydrological planning to regulate water flow, prevent floods, and ensure year-round irrigation. Notable examples such as the Chand Baori in Rajasthan, Rani ki Vav in Gujarat, and the Kallanai Dam in Tamil Nadu illustrate the effectiveness of these ancient techniques. This study employs historical analysis, field surveys, and geospatial mapping to assess the functionality and relevance of these water systems in contemporary water conservation efforts. Findings suggest that many of these structures are still operational, emphasizing their resilience and sustainability. Furthermore, integrating traditional water management principles with modern engineering could offer viable solutions for present-day water challenges, especially in regions facing water scarcity due to climate change and rapid urbanization. By revisiting these ancient methods, policymakers and conservationists can gain valuable insights into sustainable water resource management. The study highlights the importance of preserving and restoring these historic water systems, not just as heritage sites but as functional models for sustainable development. This research underscores the need for a multidisciplinary approach to reviving traditional knowledge, blending historical wisdom with contemporary science to address India's evolving water security needs.

OPTIMIZATION OF SUGARCANE BAGASSE ASH AND GRANITE WASTE AS SUSTAINABLEALTERNATIVESTORIVERSANDIN CONCRETE: AN EMMA SOFTWARE-BASED APPROACH

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Concrete doesone ofthe most widelyused building materials, withaggregates comprise 75-80% of its total volume, significantly influencing its properties. Fine aggregates alone occupy about 25-30% of the concrete volume. Most conventional concrete mixtures are gap-graded, lacking intermediate-sized particles, but optimizing aggregate packing through theoretical and empirical techniques can reduce cement paste content by 8-16% without compromising performance, making it both cost-effective and environmentally sustainable. Various computer-based mix proportioning methods, such as Europack, MixSim98, EMMA, and Betonlab.Pro, assist in optimizing aggregate combinations for maximum packing density, reduced porosity, and enhanced strength. Given the depletion of river sand, researchers are exploring alternative materials such as fly ash, slag, limestone, manufactured sand, and siliceous stone powders, though their availability and quality pose challenges. Sugarcane Bagasse Ash (SCBA), a byproduct from sugar industries, and Granite Waste (GW), generated from granite processing, present viable alternatives. India, a major producer of both sugarcane and granite, generates substantial quantities of these waste materials, which, if repurposed, can mitigate environmental hazards and serve as effective sand replacements. Using EMMA software, this study aims to determine the optimal combination of SCBA and GW based on particle size distribution, assessing their feasibility as filler materials in structuralconcrete while addressing sustainability concerns.

ENVIRONMENTAL SUSTAINABILITY IN A DISRUPTED WORLD: ANALYZING AMITAV GHOSH'S NOVEL THE *GUN ISLAND* THROUGH THE FRAMEWORK OF SDGs

Myvizhi. A

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This research paper indulges in the exploration of Sustainable development goals in relation to Indian literature. Sustainable development goals, in recent days, has become the cynosure of qualitative research. Sustainable development goals substantially concentrate on global challenges such as environmental issues, destitution, inequality, and justice. Though sustainable development goals are extensively associated with Business Economics, Commerce, and MBA programs, it is a multidisciplinary approach, and has become an inexorablepivot in academic literature. It has become the burgeoning goal of the entire human race. In this paper, the prime focus is on the stifled environment, stagnating seas, and global solidarity. Preservation of environment, conservation of natural resources, and a healthy and relishing environment altogether aligns with sustainability. In this paper, an attempt is made to analyze how sustainable development, and the peril of environmental issues intersects with the Indian novel *Gun Island* by Amitav Ghosh. The paramount focus of the paper is on the environmental sustainability in the select novel. The novel intertwines climate change, migration, and jeopardized environmental dilapidation. It explores the convergence of global calamity and parochial experiences. The novel weaves in the gravity of sustainable development goals, unequivocally the climate change, life under water, and truncated inequalities. The novel accentuates the interconnectedness of people and the biosphere. The paper focalizes on how the novel evince the human's turbulence in adapting to the changing environment, and the need for a discreet sustainable future.

COMPUTATIONAL STUDY OF MOLECULAR INTERACTIONS IN DRUG-DESIGNING

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Computational approaches have revolutionized drug discovery and development by providing deep insights into molecular interactions, significantly reducing costs and time associated with traditional experimental methods. This study explores the role of computational techniques in drug designing, focusing on molecular docking, molecular dynamics (MD) simulations, and quantum mechanics/molecular mechanics (QM/MM) hybrid models. These methodologies allow for the precise prediction of binding affinities, conformational changes, and stability of drug-receptor complexes, offering a rational approach to lead identification and optimization. Molecular docking is employed to predict the preferred orientation of drug candidates within the active sites of target biomolecules, providing key insights into binding affinity and specificity. Additionally, MD simulations are used to examine the dynamic behavior of these complexes under physiological conditions, shedding light on the stability and flexibility of ligand-protein interactions over time. The integration of QM/MM methods further enhances the accuracy of interaction predictions by incorporating electronic structure calculations, thereby improving the understanding of reaction mechanisms at the molecular level. This study also discusses the importance of in silico approaches in overcoming the limitations of traditional drug discovery, such as high attrition rates and adverse drug reactions. The application of artificial intelligence (AI) and machine learning (ML) algorithms in computational drug design is also explored, emphasizing their role in predicting potential drug candidates, optimizing pharmacokinetic properties, and repurposing existing drugs. The findings suggest that computational techniques not only accelerate the drug discovery pipeline but also improve the success rates of novel therapeutics by enabling precise target identification and rational drug design. With continuous advancements in computational power and algorithmic efficiency, these approaches are expected to further enhance the development of personalized medicine and targeted therapies. This paper highlights the significance of computational methodologies in modern drug discovery and underscores their potential in shaping the future of pharmaceutical research. The integration of computational tools with experimental validation is essential for the development of more effective and safer drugs, making computational studies a cornerstone of next-generation drug design.

THE IMPACT OF HEALTH INSURANCE ON HEALTHCARE ACCESSIBILITY IN INDIA

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India, a country with a vast and diverse population, faces significant challenges in healthcare accessibility. In recent years, health insurance has been promoted as a potential solution to improve access to healthcare services, particularly for the economically disadvantaged segments of society. This research paper investigates the impact of health insurance on healthcare accessibility in India, focusing on its role in enhancing access to medical services, reducing out-ofpocket expenses, and improving overall health outcomes. Based on both qualitative and quantitative data, the paper explores the different dimensions of healthcare accessibility, including financial, geographic, and social barriers, and evaluates how health insurance schemes are addressing these challenges.

AN OVERVIEW OF THE GEOGRAPHICAL DIVERSITY OF WESTERN RAJASTHAN

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Western Rajasthan, a significant part of the Thar Desert, exhibits remarkable geographical diversity that shapes its climate, natural resources, and human activities. This region is characterized by arid landscapes, sand dunes, rocky terrains, saline lakes, and seasonal river systems. The unique topographical variations play a crucial role in determining the ecological and socio-economic aspects of the area. The climate of western Rajasthan is predominantly arid, with extreme temperatures, low rainfall, and high evaporation rates. The region experiences frequent droughts, making water scarcity a persistent challenge. Despite the harsh climatic conditions, several river systems, such as the Luni River, provide essential water resources, supporting agriculture and livestock. Additionally, groundwater sources, though limited, play a significant role in sustaining rural communities. The soil composition of the region varies, with sandy, loamy, and rocky soil types influencing agricultural practices. Crops such as bajra (pearl millet), jowar (sorghum), and pulses dominate the agricultural landscape due to their drought-resistant nature. The presence of saline lakes like Sambhar and Didwana highlights the geological uniqueness of the region, contributing to salt production and local biodiversity. Western Rajasthan is also

rich in mineral resources, with significant deposits of gypsum, limestone, phosphorite, and marble, which drive industrial activities and economic growth. The presence of unique flora and fauna, including khejri (*Prosopis cineraria*), rohida (*Tecomella undulata*), the Great Indian Bustard, and desert foxes, showcases the adaptation of life forms to extreme desert conditions. Conservation efforts, such as the Desert National Park, play a crucial role in preserving this biodiversity. Culturally, western Rajasthan is known for its vibrant heritage, with historical cities like Jaisalmer, Bikaner, and Barmer reflecting the architectural and artistic brilliance of the region. Traditional practices such as water conservation techniques (baoris and johads) demonstrate indigenous knowledge in managing scarce resources. This paper provides an overview of the geographical diversity of western Rajasthan, analyzing its physical features, climatic conditions, water resources, soil types, biodiversity, and human adaptations. Understanding these aspects is essential for sustainable development, environmental conservation, and policy-making to address the challenges posed by desertification and climate change in this region.

IDEOLOGICAL INCLUSION OF INDIAN KNOWLEDGE SYSTEM (IKS) VALUES IN SCHOOL EDUCATION: A SYSTEMATIC POLICY ANALYSIS OF NATIONAL CURRICULUM FRAMEWORK FOR SCHOOL EDUCATION 2023

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The National Education Policy (NEP) 2020 has paved a promising path for the development of education system after decades of pending required improvement. It has extensively described the aims and commitments which makes a learner achieve full range of their potential and make them empowered. One such offshoot policy document which forms its inspiration and basis from NEP, is National Curriculum Framework for School Education (NCFSE) 2023 which is completely based on School Education Environment and its holistic growth. The Paper largely focuses on integration and inclusion of ideological principles and values of Indian Knowledge System (IKS) which is derived from ancient cultural roots of rich Indian tradition. In recent times education sector has incorporated numerous ways to revive and rejuvenate Indian Traditional Ideas especially government put huge emphasises on it and provided required support. In the NCFSE document, through various instances shared which refers to the Ancient Indian Knowledge, in the forms of “Shlokas”, “Dohas”, “Stories” etc. In a way it shed light on past relevant methods to deal with

School System and to run it successfully in due course of time. It further helps in understanding the content, defining the learning standards and creating an efficient pedagogy which not helps caters to the present needs but also includes the value system and practice from the traditional Indian knowledge.

RESPONSIBLE TOURISM PRACTICES IN WAYANAD

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Tourism is one of the world's fastest-growing sectors and can provide a significant economic opportunity for countries that establish themselves as a vacation spot. Unfortunately, tourism has historically negatively affected the environment, people, and their cultural identity. To ensure a healthy tourism practice that gives adequate importance to the well-being of people and the planet the only option for the world is to move away from irresponsible, mass tourism and learn from existing examples of Responsible tourism models. Responsible tourism takes into consideration impacts on the economy, society, and ecology. Responsible Tourism Practices in Wayanad and Major Challenges Related to this practice have been studied in this research paper.A descriptive method of research has been used in this research considering both primary and secondary data. The collected data was analyzed using various statistical tools like bar diagrams & pie charts. The majority rated the practices of responsible tourism in Wayanad as good but community development practices as average.Most of the respondents perceived strong efforts in preserving the environment. Education initiatives for the local community are viewed as average.The results suggest a need for improvement in communicating and educating local communities about responsible tourism practices.

INDIA-USA TRADE RELATIONS: TRENDS AND FUTURE PROSPECTS

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The trade relationship between India and the United States has evolved significantly over the years, characterized by growing bilateral trade, policy shifts, and economic partnerships. This paper analyses their trade patterns using trend analysis and index analysis, focusing on the Export Intensity Index (EII) and Import Intensity Index (III). These indices measure how important the U.S. is as a trade partner for India and vice versa. These indices provide a quantitative measure of trade

dynamics, assessing the extent of bilateral trade concentration, diversification, and potential areas for expansion through index-based analysis, this paper provides a structured approach to understanding trade patterns, offering policy recommendations for enhancing trade cooperation. India and the United States have a strong and evolving trade relationship. Strengthening trade integration, reducing tariff barriers, and fostering trade partnerships are key strategies for sustaining long-term growth in India-U.S. trade relations.

SUSTAINABLE BUSINESS PRACTICES AND CORPORATE RESPONSIBILITY

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Corporate social responsibility and sustainable business have become the ethos of modern business strategies, addressing economic, environmental, and social concerns. Companies worldwide are increasingly recognizing the need to integrate sustainability into their business in order to sustain long-term profitability and ethical accountability. This essay discusses the importance of sustainable business practices, their effect on corporate performance, and the significance of corporate responsibility in shaping a sustainable future. The research identifies important sustainable business practices, such as energy-efficient operations, waste reduction, ethical sourcing, and stakeholder engagement. It discusses the role of regulatory frameworks and international norms of sustainability guiding top firms toward ethical behavior. Besides, the study investigates the impact of corporate social responsibility (CSR) initiatives on brand reputation, customer loyalty, and financial performance. There is a comparative examination of international and Indian corporate sustainability programs to identify the difficulties and advantages that companies encounter in implementing sustainable measures. The research also discusses the innovation and technological roles in encouraging business responsibility, focusing on the shift towards green finance, digital solutions, and circular economy models. The results show that companies that use sustainability-based approaches not only enhance their competitive advantage, all while benefiting the environment and the health of society. The research concludes by stressing the need for a collaborative mechanism by policymakers, corporations, and consumers to propel sustainable development goals (SDGs). This study contributes to the body of literature through offering critical knowledge of best practice and strategies. This can be used by companies to achieve long-term growth while fulfilling their corporate obligations.

GENDER EQUALITY FOR SUSTAINABLE DEVELOPMENT IN INDIA: AN ANALYTICAL STUDY

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Sustainable Development is the development that meets the needs of the present without compromising the ability of future generation to meet their own needs. In this paper, we will examine one of the goals of sustainable development set out in United States 2030 Agenda. Gender Equality is not only a fundamental human right, but a necessary foundation for a peaceful, prosperous and sustainable world. The objectives of the paper is to study the importance of gender equality for sustainable development, the role of women at present, role of education for empowering women. Since Indian society is patriarchal in nature so in almost every sector women are tried to discriminate and dominated by the male counterparts. Therefore, it is very important to know about gender issues and how those issues can be solved. Education is one of the key element to empower women and girls and to bring parity in the society. For achieving sustainability of the nation the government must take initiatives in policy formulation, interaction and awareness programme should be organized, health care services etc. should be provided for the benefits of the society and humanity at large.

"36TH INTERNATIONAL SURAJKUND CRAFT FAIR - A FAIR TO REMEMBER"A KEY INITIATIVE BY HARYANA TOURISM CORPORATION

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The purpose of this study is to determine why people visit the Surajkund Crafts Fair in Faridabad. This paper used secondary data for its source of data. India hosts numerous religious and cultural celebrations, including fairs and festivals, which draw a sizable number of tourists. Surajkund International Craft Fair in Haryana uses craftsmen from around the world who have been invited to assist promote handicrafts and handlooms. The Surajkund Crafts Fair has also reflected the fusion of diverse national cultures. Every year, a different Indian state is chosen as the topic for the

Surajkund Crafts Mela, and the atmosphere of the fair is developed in accordance. Exhilarating folk performances are also held at the venue, and each state plays its own folk music.It is believed that Surajkund is a spectacular example of the fusion of Indian culture, art, and music with the ethos of other cultures. The environment of mela is tranquil and musical. Surajkund mela provide a solid platform for artists and craftsmen to display their work as well as welcoming artists from other countries. The main purpose of holding this fair is to showcase India's traditional talent and art and to educate people about it. The Mela is in fact a keeper of legacy crafts using age-old techniques that are disappearing owing to low-quality machine imitations, and a particular section is set aside for presenting these crafts. Visitors and buyers get a chance to meet in the fair. Craftsmen and buyers came face to face with each other. Craftsmen and artisans in this fair find a direct way to explore and improve their artwork.

THE FUTURE OF REMOTE WORK: CHALLENGES, OPPORTUNITIES, AND TRANSFORMATIONS

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Remote work has witnessed a significant transformation over the past decade, particularly accelerated by the COVID-19 pandemic. As organizations and employees adapt to new work environments, the future of remote work remains a dynamic and evolving subject. This paper explores the emerging trends, benefits, challenges, and long-term implications of remote work for businesses, employees, and society. The study examines key drivers shaping the future of remote work, including advancements in digital technology, artificial intelligence, and automation. It discusses the increasing adoption of hybrid work models, where employees balance remote and in-office work, leading to greater flexibility and productivity. The paper also highlights the role of cloud computing, virtual collaboration tools, and cybersecurity measures in supporting seamless remote work operations. While remote work offers benefits such as cost savings, increased work-life balance, and access to a global talent pool, it also presents challenges. Issues like employee isolation, communication barriers, reduced team cohesion, and cybersecurity risks need strategic solutions. Moreover, disparities in internet access and digital infrastructure impact the feasibility of remote work across different regions and socioeconomic groups. The research further explores the evolving policies and regulations governing remote work, including labor laws, taxation, and corporate strategies. Companies are rethinking traditional office spaces,

investing in virtual work environments, and prioritizing employee well-being to ensure sustainable remote work models. The future of remote work is also influenced by global economic trends, workforce demographics, and changing employee expectations regarding flexibility and autonomy. In conclusion, the future of remote work depends on the ability of businesses, governments, and individuals to adapt to technological advancements and evolving workplace dynamics. By addressing challenges and leveraging opportunities, remote work can create a more inclusive, efficient, and resilient work environment for the future. This paper provides insights into the potential transformations and best practices to enhance remote work sustainability and effectiveness in the coming years.

INNOVATIVE SOLUTIONS FOR CLIMATE CHANGE MITIGATION AND ADAPTATION

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Climate change poses significant threats to global ecosystems, economies, and societies. To mitigate and adapt to these impacts, innovative solutions are urgently needed. This paper presents a comprehensive review of cutting-edge innovations in climate change mitigation and adaptation, including:

- Renewable energy technologies, such as advanced solar panels and wind turbines
- Carbon capture, utilization, and storage (CCUS) technologies
- Climate-resilient infrastructure, including sea walls, levees, and green roofs
- Sustainable agriculture practices, such as regenerative agriculture and vertical farming
- Climate-smart water management systems

These innovations have the potential to significantly reduce greenhouse gas emissions, enhance climate resilience, and promote sustainable development. However, their widespread adoption requires addressing various barriers, including policy, financing, and social acceptance.

This paper provides a framework for understanding the role of innovation in addressing climate change and highlights the need for continued research, development, and deployment of climate-friendly technologies.

COMPARATIVE ANALYSIS OF CONCRETE'S MECHANICAL PROPERTIES INCORPORATING EGGSHELL POWDER AND COCONUT FIBERS IN COMBINATION

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Concrete remains an indispensable material in the construction industry due to its versatility, durability, and strength.. The primary constituents of concrete—cement, fine aggregate, and coarse aggregate—play a crucial role in determining its mechanical properties. However, ongoing research aims to enhance concrete performance while making it more cost-effective and environmentally sustainable by incorporating waste materials as partial replacements. A key advantage of concrete is its ability to accommodate supplementary materials without compromising structural integrity. Researchers have explored various waste materials as substitutes for cement, sand, and aggregates, striving to balance strength enhancement with cost reduction. While many studies have shown promising initial results, some alternative materials have exhibited performance limitations over time. Eggshell waste, abundantly generated from households, poultry farms, and food industries, is one such material with potential applications in construction. Typically discarded in landfills, eggshells are rich in calcium, making them a viable substitute for cement.. Similarly, coconut fibers, a natural byproduct of coconut processing, have shown potential in improving the mechanical performance of concrete by enhancing its toughness and crack resistance. This study aims to assess the combined effect of eggshell powder and coconut fibers on concrete properties, to evaluate the water absorption capacity of concrete and establish its correlation with strength properties. To analyze the workability of concrete mixes containing varying proportions of eggshell powder and coconut fibers By integrating waste materials like eggshell powder and coconut fibers into concrete, this research seeks to contribute to the development of an ecofriendly, cost-efficient, and high-performance construction material, aligning with modern sustainability goals.

WASTE MANAGEMENT STRATEGIES FOR A SUSTAINABLE FUTURE

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Waste management is a critical component of environmental sustainability, as the increasing generation of waste poses significant ecological and health challenges. This paper explores various waste management strategies that contribute to a sustainable future, emphasizing the importance of reducing, reusing, and recycling (3Rs), innovative technologies, and policy interventions. Effective waste management begins with waste reduction at the source, which involves sustainable production and consumption patterns, eco-friendly packaging, and public awareness campaigns. The concept of a circular economy, where materials are continuously reused and recycled, plays a key role in minimizing waste generation. Recycling and composting are essential techniques that not only reduce landfill burden but also conserve natural resources and energy. Advanced recycling technologies, such as chemical recycling and biodegradable materials, offer promising solutions to modern waste challenges. Technological innovations, such as waste-to-energy (WTE) plants, contribute to sustainability by converting organic waste into renewable energy sources. Additionally, smart waste management systems, powered by artificial intelligence and the Internet of Things (IoT), optimize waste collection and disposal processes, reducing environmental pollution. The role of extended producer responsibility (EPR) in ensuring that manufacturers take accountability for the disposal of their products is also highlighted as a crucial policy measure. Governments and international organizations play a significant role in framing waste management policies that promote sustainability. Regulations on plastic waste reduction, landfill management, and hazardous waste disposal are essential for environmental conservation. Public participation, including community-driven waste management initiatives, enhances the effectiveness of waste policies. Despite advancements, challenges such as inadequate infrastructure, lack of public awareness, and policy implementation gaps hinder sustainable waste management. Addressing these issues requires a multi-stakeholder approach, involving governments, industries, and communities working together to achieve long-term waste reduction and sustainability goals. This study concludes that integrated waste management strategies, technological advancements, and stringent policies are vital for ensuring a sustainable future. By adopting a proactive approach to waste management, societies can mitigate environmental degradation, conserve natural resources, and promote a healthier planet for future generations.

RECENT ADVANCES IN ORGANOMETALLIC COMPOUNDS FOR SUSTAINABLE INDUSTRIAL PROCESSES

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Organometallic compounds have gained significant attention in recent years due to their pivotal role in sustainable industrial processes. These compounds, characterized by metal-carbon bonds, exhibit unique catalytic properties that enable efficient, eco-friendly, and cost-effective industrial applications. This review explores the latest advancements in organometallic chemistry, focusing on their applications in green catalysis, polymerization, pharmaceuticals, and energy storage. One of the most critical contributions of organometallic compounds is in catalysis, particularly in transition-metal-catalyzed reactions, which have revolutionized the synthesis of fine chemicals, agrochemicals, and pharmaceuticals. Recent developments in palladium, nickel, and iron-based catalysts have enhanced reaction efficiency while minimizing toxic byproducts. Additionally, organometallic compounds play a crucial role in sustainable polymerization techniques, such as ring-opening metathesis polymerization (ROMP) and living polymerization, contributing to biodegradable and recyclable polymer production. The pharmaceutical industry has also witnessed breakthroughs in drug development through organometallic complexes. Platinum-based anticancer drugs, such as cisplatin and carboplatin, remain essential in chemotherapy, while new ruthenium- and gold-based compounds are emerging as promising alternatives with improved efficacy and reduced side effects. Furthermore, organometallic compounds are driving innovations in renewable energy technologies, particularly in the development of metal-organic frameworks (MOFs) for gas storage and separation, as well as in lithium-ion and next-generation batteries. Sustainability remains a core focus in modern industrial applications, and recent advancements in green organometallic chemistry emphasize environmentally friendly synthesis pathways, energy-efficient processes, and waste minimization. Computational chemistry and artificial intelligence are also being integrated into organometallic research, allowing for precise catalyst design and predictive modeling of reaction mechanisms. Despite these advancements, challenges such as cost, stability, and toxicity of certain organometallic compounds persist, necessitating further research into sustainable alternatives and improved catalytic efficiency. This paper provides a comprehensive overview of recent trends, key developments, and future perspectives in organometallic chemistry, highlighting their transformative impact on sustainable industrial practices. By leveraging these innovations, industries can progress toward greener and more efficient processes, aligning with global sustainability goals.

EXPLORING MYTH, MARGINALITY, METAPHOR AND NATURE: AN ECO-MARGINAL STUDY OF S. HARESH'S *MOUSTACHE*

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This paper focuses on S Haresh's groundbreaking novel *Moustache* (2020) as a narrative of marginalization of both its dalit protagonist Vavachan, and the changing contours of its natural flora and fauna due to increasing anthropoceneintererference. The locale of the novel Kuttanad is known for its lush paddy fields, backwaters and canals. It is also referred to as the rice bowl of Kerala where below-sea level farming is practised. The region is well known for its geographic peculiarities which have been integrated into the corpus of the novel. Vavachan's quixotic initiation and traumatic caste atrocity runs parallel with the ecological depletion of the region. The landscape defines the protagonists suffering. The landscape is also equated with problematic of politics in the novel. Through his refusal to do away with the moustache, Vavachan draws proximity with Ravanan, a mythical character of dalit representation. But his resistance comes at the cost of his mysterious disappearance from the scene. He assumes significance fitting into various roles through his migration to different places. Similarly, the natural lush green ecology is often threatened with rising human activities. The novel is as much a narrative of dalit agency as it is about ecological homicide. The dichotomy between the civilization and wilderness is also significant when the concept of sustainable ecology is doing rounds. By exploring the relationship between the people on the margins and ecology on declining spree, Haresh identifies with the trope of dalits and nature indicating that their relationship is not one of role-reversal, but one of sharing the same fate being victims of discrimination and agency. **Key Words**: sustainable ecology, caste discrimination, civilization and wilderness, geographic peculiarity, ecological homicide

THE ROLE OF HIMALAYAS IN SHAPING THE CLIMATE OF SOUTH ASIA

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The Himalayas, the world's youngest and tallest mountain range, play a pivotal role in shaping the climate of South Asia. Spanning over 2,400 kilometers across five countries, this vast mountain system acts as a climatic barrier, influencing monsoonal patterns, temperature regulation, and precipitation distribution. This paper explores the Himalayas' multifaceted role in controlling South Asia's climate, including their impact on the monsoon system, their role in water security, and their influence on regional weather patterns. One of the most significant climatic influences of the Himalayas is their effect on the Indian summer monsoon. The range prevents cold continental air from Central Asia from penetrating southward, allowing warm moist winds from the Indian Ocean to dominate the region. This results in heavy rainfall on the windward slopes while creating a rain-shadow effect on the leeward side, leading to arid conditions in areas like Ladakh and the Tibetan Plateau. Furthermore, the Himalayas serve as a crucial water reservoir, storing vast amounts of snow and ice, which melt seasonally to feed major river systems such as the Ganges, Brahmaputra, and Indus. This sustains agriculture, hydropower, and biodiversity, making the region heavily dependent on Himalayan-fed rivers. Additionally, the Himalayas significantly influence regional temperature patterns. Their high elevation contributes to temperature variations that impact local climates, from tropical foothills to frigid alpine conditions. The mountains also affect wind circulation patterns, contributing to extreme weather events like storms and cloudbursts. However, the changing climate, marked by rising temperatures and glacial retreat, threatens to disrupt these climatic mechanisms, leading to unpredictable monsoons, water scarcity, and increased natural disasters. Understanding the Himalayas' role in climate regulation is essential for sustainable development, environmental conservation, and disaster management in South Asia. This paper highlights the need for proactive climate policies, cross-border cooperation, and conservation efforts to mitigate the adverse impacts of climate change on the region's climate and water resources. By examining historical climate trends, current meteorological data, and future projections, this study underscores the Himalayas' indispensable role in maintaining South Asia's ecological and climatic balance.

THE ROLE OF MEDICINAL PLANTS IN MODERN HEALTHCARE: A BOTANICAL PERSPECTIVE

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Medicinal plants have played a crucial role in healthcare systems for centuries, serving as primary sources of therapeutic agents and contributing significantly to modern drug discovery. In recent years, there has been a resurgence of interest in herbal medicine due to its potential efficacy, minimal side effects, and sustainability compared to synthetic drugs. This paper explores the botanical perspective of medicinal plants in modern healthcare, emphasizing their pharmacological properties, active compounds, and integration into contemporary medical practices. The study highlights the diverse phytochemicals present in medicinal plants, including alkaloids, flavonoids, terpenoids, and polyphenols, which exhibit antimicrobial, anti-inflammatory, antioxidant, and anticancer properties. Through ethnobotanical studies and advanced scientific research, plants such as Curcuma longa (turmeric), Azadirachta indica (neem), Withania somnifera (ashwagandha), and Rauvolfia serpentina (sarpagandha) have been validated for their therapeutic benefits. Additionally, modern analytical techniques, such as chromatography, spectroscopy, and molecular docking studies, have facilitated the identification and isolation of bioactive compounds, leading to the development of plant-derived pharmaceuticals. Furthermore, the paper examines the integration of medicinal plants into mainstream healthcare through the development of herbal formulations, nutraceuticals, and alternative therapies such as Ayurveda, Traditional Chinese Medicine (TCM), and Homeopathy. Regulatory frameworks and quality control measures are also discussed to ensure the safety, efficacy, and standardization of plant-based medicines. Despite their potential, challenges such as habitat destruction, overharvesting, and lack of scientific validation hinder the widespread adoption of herbal medicine. Therefore, sustainable conservation practices and interdisciplinary research collaborations are essential to harness the full potential of medicinal plants. In conclusion, medicinal plants remain a vital component of modern healthcare, offering a natural and holistic approach to disease prevention and treatment. With ongoing scientific advancements and global recognition of traditional knowledge, the role of botanical medicine is expected to expand, contributing to a more integrative and sustainable healthcare system. This paper provides a comprehensive botanical perspective on the significance of medicinal plants, bridging the gap between traditional wisdom and modern scientific innovation.

FOLK TRADITIONS AND ORAL HISTORIES OF RAJASTHAN: A HISTORICAL PERSPECTIVE

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Rajasthan, the land of kings, has a rich and vibrant cultural heritage deeply rooted in its folk traditions and oral histories. These traditions serve as vital sources for understanding the historical and socio-cultural evolution of the region. Unlike official records, which often focus on rulers and battles, folk narratives, ballads, and oral legends offer a people's perspective on history, illuminating the everyday lives, beliefs, struggles, and aspirations of communities across centuries. This paper explores the significance of Rajasthan's folk traditions and oral histories in reconstructing the past, analyzing their role in preserving cultural identity, historical consciousness, and social values. The study delves into the major forms of oral traditions in Rajasthan, including folk songs (Maand, Panihari, and Bhopa-Bhopi narratives), oral epics (Pabuji Ki Phad and Devnarayan Katha), and community-based storytelling traditions (Kathavachan and Charan-Bhat performances). These traditions not only entertain but also educate, reinforce moral values, and sustain collective memory. Additionally, the paper examines the role of oral history in preserving historical events such as the Rajput resistance against invaders, the sacrifices of folk heroes like Pabuji and Tejaji, and the lived experiences of marginalized communities that are often overlooked in written history. Moreover, this research highlights the challenges faced by Rajasthan's oral traditions in the modern era, particularly due to urbanization, globalization, and the decline of traditional patronage systems. While digital documentation and academic interest have provided some means of preservation, the authenticity and transmission of these oral narratives remain under threat. The study suggests strategies for safeguarding these traditions, including community-led initiatives, integration into formal education, and the use of digital platforms for wider dissemination. By examining the historical perspective of Rajasthan's folk traditions and oral histories, this paper contributes to the broader discourse on intangible heritage and its role in shaping regional history. It emphasizes the need to recognize oral traditions as valuable historical sources, ensuring their continued relevance in contemporary historiography and cultural studies.

ADVANCEMENTS AND APPLICATIONS OF BIOTECHNOLOGY: INNOVATIONS, CHALLENGES, AND FUTURE PROSPECTS

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Biotechnology has revolutionized various fields, including healthcare, agriculture, environmental science, and industrial processes. This paper explores the advancements, applications, and future prospects of biotechnology, emphasizing its role in addressing global challenges. Modern biotechnology, driven by genetic engineering, molecular biology, and bioinformatics, has led to significant innovations such as genetically modified organisms (GMOs), personalized medicine, biofuels, and bioremediation.In agriculture, biotechnology has enhanced crop yield, resistance to pests, and tolerance to environmental stresses, ensuring food security. Genetically modified crops like Bt cotton and Golden Rice have demonstrated improved productivity and nutritional value. Similarly, biotechnological advancements in animal husbandry and aquaculture have contributed to sustainable livestock and fish farming. In healthcare, biotechnology has paved the way for groundbreaking treatments, including gene therapy, stem cell research, and vaccine development. The rapid development of mRNA-based COVID-19 vaccines highlights the potential of biotechnological innovations in combating global health crises. Additionally, recombinant DNA technology and monoclonal antibodies have revolutionized disease diagnosis and treatment, leading to personalized medicine and targeted therapies. Biotechnology also plays a crucial role in environmental sustainability through bioremediation, biofuels, and waste management. Microorganisms engineered for bioremediation help in detoxifying pollutants, while biofuels derived from algae and plant biomass serve as eco-friendly alternatives to fossil fuels. Despite its numerous benefits, biotechnology raises ethical, regulatory, and biosafety concerns. Issues related to genetic modifications, bioethics, intellectual property rights, and potential ecological risks necessitate stringent policies and global cooperation. Public awareness and responsible research practices are essential to ensuring the ethical and safe application of biotechnological innovations. This paper provides a comprehensive overview of the recent advancements in biotechnology, its interdisciplinary applications, and the challenges associated with its implementation. By leveraging biotechnological tools responsibly, humanity can address critical issues such as food security, disease management, and environmental sustainability. The future of biotechnology lies in continuous research, policy reforms, and public engagement to maximize its benefits while mitigating potential risks.

ADVANCES IN PLANT PHYSIOLOGY: UNDERSTANDING GROWTH, METABOLISM, AND ENVIRONMENTAL ADAPTATIONS

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Plant physiology is a fundamental discipline that explores the intricate biochemical, molecular, and physiological processes governing plant growth, development, and adaptation. This paper provides a comprehensive review of recent advancements in plant physiology, focusing on key aspects such as photosynthesis, respiration, nutrient uptake, hormonal regulation, and stress responses. The study highlights the significance of photosynthesis as the primary driver of plant productivity, emphasizing recent findings on photosystem efficiency, carbon fixation pathways, and the role of photoprotection mechanisms. Additionally, advancements in plant respiration are discussed, shedding light on energy metabolism and its impact on overall plant health. The mechanisms of nutrient absorption and translocation are examined, particularly in the context of soil-plant interactions and their influence on crop yield. Hormonal regulation plays a crucial role in plant development, and this paper explores the latest research on phytohormones such as auxins, gibberellins, cytokinins, abscisic acid, and ethylene. Their interactions in seed germination, flowering, fruit development, and stress responses are discussed, providing insights into the complex signaling networks that regulate plant physiology. Environmental stress, including drought, salinity, temperature extremes, and pollution, poses significant challenges to plant growth. This paper examines plant adaptation strategies, such as osmotic adjustment, antioxidant defense mechanisms, and epigenetic modifications, which enhance resilience against abiotic stresses. The role of gene expression and genetic engineering in improving stress tolerance is also explored, highlighting biotechnological approaches for sustainable agriculture. Furthermore, the paper discusses the impact of climate change on plant physiology and the potential of modern tools such as remote sensing, genomics, and bioinformatics in advancing research in this field. Future directions include integrating artificial intelligence and machine learning for predictive modeling of plant responses, which could revolutionize precision agriculture and crop improvement strategies. In conclusion, understanding plant physiology is essential for optimizing agricultural productivity, conserving biodiversity, and ensuring food security. This paper underscores the importance of interdisciplinary approaches in addressing the challenges posed by a changing environment, offering innovative solutions for sustainable plant growth and development.

ROLE OF TRANSGENIC PLANTS IN AGRICULTURE AND BIO-FARMING: ADVANCEMENTS, CHALLENGES, AND FUTURE PROSPECTS

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The rapid advancements in genetic engineering have led to the development of transgenic plants, which play a crucial role in modern agriculture and bio-farming. Transgenic plants, created through the introduction of specific genes to enhance desirable traits, have revolutionized crop production by improving yield, resistance to pests and diseases, tolerance to abiotic stresses, and nutritional quality. This paper explores the significance of transgenic plants in agriculture, highlighting their contributions to sustainable farming practices, food security, and environmental conservation. One of the primary benefits of transgenic plants is their ability to resist pests and diseases, reducing the dependency on chemical pesticides and thereby minimizing environmental pollution. Crops such as Bt cotton and Bt maize express insecticidal proteins derived from Bacillus thuringiensis, effectively protecting them from harmful pests. Similarly, transgenic crops engineered for herbicide tolerance, such as glyphosate-resistant soybean and corn, allow for efficient weed management, reducing labor and farming costs. Additionally, transgenic plants have been instrumental in addressing challenges posed by climate change. Genetic modifications enable crops to tolerate drought, salinity, and extreme temperatures, ensuring stable yields even in adverse conditions. Enhanced nutrient content in bio-fortified crops, such as Golden Rice enriched with vitamin A, demonstrates the potential of transgenic technology in combating malnutrition. Bio-farming, which integrates biotechnological advancements with sustainable agricultural practices, benefits significantly from transgenic crops. These plants contribute to conservation agriculture by reducing soil erosion, improving water-use efficiency, and decreasing greenhouse gas emissions. However, the commercialization of transgenic plants raises concerns regarding biosafety, gene flow, and ethical considerations. Regulatory frameworks and rigorous risk assessments are essential to ensure the safe deployment of genetically modified crops. This paper provides a comprehensive review of the role of transgenic plants in agriculture and bio-farming, discussing their advantages, challenges, and future prospects. While transgenic crops have proven beneficial in enhancing productivity and sustainability, further research and responsible regulatory policies are required to address public concerns and optimize their impact on global food security.

MULTIFACETED USES OF CHILLI: CULINARY, MEDICINAL, AGRICULTURAL, AND INDUSTRIAL PERSPECTIVES

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Chilli (Capsicum spp.) is one of the most widely consumed spices globally, known for its pungency, flavor, and health benefits. It has been an integral part of culinary traditions, medicinal applications, and industrial uses for centuries. This paper explores the diverse uses of chilli in various domains, including food, medicine, agriculture, and industry. In the culinary sector, chilli is used as a spice, flavor enhancer, and food preservative due to its antimicrobial properties. It is a key ingredient in numerous traditional and modern dishes worldwide, contributing to the taste, color, and aroma of food products. Different varieties, such as red, green, and dried chilli, serve specific culinary purposes, enhancing the sensory appeal of meals. Medicinally, chilli contains capsaicin, a bioactive compound known for its therapeutic properties. It exhibits anti-inflammatory, analgesic, and antioxidant effects, making it useful in treating conditions such as arthritis, muscle pain, and cardiovascular diseases. Capsaicin is also used in weight management due to its metabolism-boosting effects. Additionally, chilli plays a role in respiratory health and immune system enhancement, further increasing its medicinal significance. In agriculture, chilli is utilized as a natural pesticide due to its insect-repellent properties. It is also an economically important crop that provides livelihood opportunities to millions of farmers worldwide. Various breeding techniques and hybridization efforts aim to improve chilli yield, disease resistance, and nutritional value. Industrially, chilli is a source of natural pigments, such as oleoresins, which are used in food coloring, cosmetics, and pharmaceuticals. It is also used in pepper sprays for self-defense, demonstrating its versatility beyond food applications. Despite its numerous benefits, excessive consumption of chilli may lead to digestive discomfort and allergic reactions in some individuals. However, its overall nutritional, medicinal, and economic significance makes it a valuable agricultural commodity with vast applications. This paper aims to provide a comprehensive review of the multifaceted uses of chilli, highlighting its importance in different fields and suggesting future research directions to optimize its benefits.

MULTIFACETED USES OF CORIANDER (*CORIANDRUM SATIVUM*): A CULINARY, MEDICINAL, AND INDUSTRIAL PERSPECTIVE

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Coriander (Coriandrum sativum), commonly known as cilantro or dhania, is a versatile herb widely used in culinary, medicinal, and industrial applications. This paper explores the diverse uses of coriander, highlighting its significance in food, traditional medicine, and modern industries. Rich in essential nutrients, antioxidants, and bioactive compounds, coriander exhibits numerous health benefits, including anti-inflammatory, antimicrobial, and digestive properties. Coriander seeds and leaves are extensively used in global cuisines, adding flavor and aroma to various dishes. The essential oil extracted from coriander is a valuable ingredient in the food, pharmaceutical, and cosmetic industries due to its antimicrobial and preservative properties. Additionally, coriander is known for its role in traditional medicine, where it is used to treat digestive disorders, regulate blood sugar levels, and support cardiovascular health. Recent studies also indicate its potential in managing neurodegenerative diseases and promoting liver health. Beyond culinary and medicinal uses, coriander is utilized in agriculture as a bio-pesticide and in industrial applications such as perfumery and food preservation. The presence of linalool and other volatile compounds in coriander essential oil contributes to its antimicrobial and antifungal effects, making it a promising natural alternative to synthetic preservatives. This review aims to present an in-depth analysis of coriander's applications, backed by scientific studies and traditional knowledge. The paper also discusses the potential challenges in coriander cultivation, processing, and commercialization. By understanding the multifaceted benefits of coriander, this study emphasizes the need for further research to enhance its applications in food security, healthcare, and sustainable industries.

BIOFERTILIZERS AND THEIR ROLE IN SUSTAINABLE AGRICULTURE: A BOTANICAL PERSPECTIVE

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Sustainable agriculture is essential for ensuring food security while minimizing environmental degradation. Among various eco-friendly agricultural practices, biofertilizers have emerged as a promising alternative to chemical fertilizers, enhancing soil fertility, crop productivity, and environmental sustainability.

Biofertilizers are composed of beneficial microorganisms such as nitrogen-fixing bacteria (*Rhizobium, Azotobacter, Azospirillum*), phosphate-solubilizing bacteria (*Pseudomonas, Bacillus*), and mycorrhizal fungi that improve nutrient availability and uptake by plants. These microbial inoculants promote plant growth by fixing atmospheric nitrogen, solubilizing phosphorus, and synthesizing plant growth regulators, thereby reducing the dependency on synthetic fertilizers. This paper provides a botanical perspective on the role of biofertilizers in sustainable agriculture, emphasizing their mechanisms of action, plant-microbe interactions, and their impact on soil health. The application of biofertilizers improves soil structure, enhances microbial diversity, and increases organic matter content, contributing to long-term soil fertility. Moreover, biofertilizers help mitigate environmental issues such as soil degradation, groundwater contamination, and greenhouse gas emissions associated with excessive chemical fertilizer use. Studies have shown that crops treated with biofertilizers exhibit improved resistance to pathogens, drought tolerance, and enhanced nutrient efficiency, making them a viable strategy for organic and sustainable farming systems. Despite their benefits, the large-scale adoption of biofertilizers faces challenges such as variability in field performance, short shelf life, and the need for optimal environmental conditions for microbial survival. This paper discusses recent advancements in biofertilizer technology, including carrier-based formulations, microbial consortia, and genetic engineering approaches to enhance the efficiency and stability of biofertilizer products. Additionally, policy initiatives, farmer awareness programs, and integrated nutrient management strategies are highlighted as essential steps for promoting the widespread use of biofertilizers in modern agriculture. In conclusion, biofertilizers offer a sustainable, cost-effective, and environmentally friendly approach to agriculture by improving soil fertility and crop productivity. Future research should focus on developing innovative biofertilizer formulations and optimizing their application methods to maximize their benefits for global food security and ecological sustainability.

ETHNOBOTANY AND TRADITIONAL KNOWLEDGE: A STUDY OF MEDICINAL PLANT USE

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Ethnobotany, the study of the relationship between people and plants, plays a crucial role in preserving traditional knowledge and promoting sustainable healthcare practices. Traditional medicinal plants have been used for centuries by indigenous

and rural communities for treating various ailments, yet much of this knowledge remains undocumented or at risk of being lost due to modernization and deforestation. This study explores the ethnobotanical significance of medicinal plants, focusing on their traditional uses, preparation methods, and cultural importance. The research is based on field surveys conducted in selected rural and tribal communities, where structured interviews and participatory observations were used to document indigenous knowledge related to plant-based medicine. The findings reveal a diverse range of medicinal plant species used to treat ailments such as fever, skin infections, digestive disorders, respiratory diseases, and inflammatory conditions. The study identifies key plant species, their local names, therapeutic properties, and modes of administration, highlighting the deep-rooted botanical knowledge within these communities. Despite their efficacy, traditional medicinal practices face challenges such as overharvesting, habitat destruction, and the erosion of indigenous knowledge due to urbanization and modernization. The study emphasizes the need for conservation strategies, sustainable harvesting practices, and integration of ethnobotanical knowledge with modern scientific research to validate and enhance the medicinal value of these plants. Collaborative efforts between researchers, policymakers, and local healers are essential to safeguard traditional knowledge and promote the responsible use of medicinal plants. By documenting and analyzing the ethnobotanical knowledge of medicinal plants, this study contributes to the preservation of cultural heritage, biodiversity conservation, and the development of herbal medicine as a viable healthcare option. The findings underscore the importance of integrating traditional plant-based treatments with contemporary medical research to harness their full potential for global health and well-being.

KNOWLEDGE MANAGEMENT IN ONLINE COMMUNITIES: DRIVING DIGITAL MARKETING IMPACT

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This study examines the influence of knowledge management (KM) on online communities and its role in enriching digital marketing outcomes. Effective KM practices contribute to leveraging our online communities to the fullest potential of user interaction, content sharing, and brand engagement. This study examines how KM contributes to the creation, organisation, and dissemination of user-generated

content to increase customer engagement, build trust, and innovate in marketing strategies. Using KM systems, businesses can mine actionable insights from community discussions to make data-driven decisions and customise marketing campaigns. It reveals how KM promotes a culture of collaboration and transparency in online communities, strengthening customer loyalty and thereby promoting organic advocacy for brands. In addition, the embedding of KM in these communities reduces marketing costs in the sense that it enables the production of content that reduces the overall costs and amplifies community innovations. These findings indicate that KM enables online communities to transform themselves into strategic digital marketing assets for sustainable growth and competitive advantage. Insights from this study contribute to a growing body of literature on knowledge management and digital marketing by providing actionable insights for businesses looking to tap into the power of online communities.

ENHANCING TRAFFIC FLOW: AUTOMATED ROUNDABOUT-HIGHWAY COORDINATION

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Transportation plays a vital role in the development of a nation, and India boasts an extensive road network connecting major cities. Infrastructure advancements such as expressways, cloverleaf interchanges, bridges, tunnels, and flyovers have transformed metropolitan areas, enhancing connectivity and traffic management. To accommodate heavy traffic and ensure uninterrupted movement, modern flyovers are designed to minimize congestion and improve safety. These structures help reduce conflict points, thereby enhancing pedestrian and driver security. Additionally, intelligent traffic systems, such as U-turn alert mechanisms, use visual signals to inform drivers about safe maneuvering. A vehicle detection system integrated with speed breakers and cross-connected red-light indicators further helps prevent accidents by regulating traffic flow efficiently. Innovative technologies are also being incorporated to enhance road safety and structural monitoring. A bridge collapse detection system equipped with sensors can identify structural abnormalities and cracks, sending immediate alerts to authorities and commuters. Additionally, an Automatic Street Light Control System, powered by Light Dependent Resistors (LDR), ensures energy-efficient lighting by automatically switching streetlights on and off

based on ambient light levels. As technology continues to evolve, smart highway systems are being developed to address multiple challenges using advanced techniques. By integrating modern safety measures, automated monitoring, and efficient lighting solutions, highways are becoming more reliable, sustainable, and capable of handling increasing transportation demands.

HISTOCHEMICAL CHARACTERIZATION AND PROPAGATIONAL STUDIES OF *BLEPHARISSINDICA*EX T.ANDERS.

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Blepharissindica, a vulnerable plant native to the Thar Desert, belongs to the Acanthaceae family. Due to its medicinal properties, studying the localization of various elements such as proteins, carbohydrates, and lipids in different parts of the plant, like the stem and leaf, and propagational studies become crucial. In the stem, protein concentration was highest in the epidermis, outer and inner cortex, pericycle, vascular tissues, xylem, and phloem, with some presence observed in the pith. In the leaf, protein levels were particularly prominent in the vascular bundles, bundle sheath, palisade, and chlorenchyma tissues, as well as the spongy parenchyma. For carbohydrates, the stem exhibited the highest presence in the epidermis, cortex, and vascular tissues. In the leaf, carbohydrates were distributed across all tissues, with the highest concentrations found in those with thick cell walls, including the upper and lower epidermis covered by the cuticle. Carbohydrates were also most concentrated in the vascular bundles (both median and laminar), bundle sheath cells, and thick-walled tissues around the median vascular bundles. In contrast, softer tissues like the palisade tissue and spongy parenchyma contained comparatively fewer carbohydrates. For propagational studies, seeds were initially used as explants to grow complete seedlings. After extracting the seeds from the fruit capsules and removing the seed coat, they were inoculated in a modified MS medium, both with and without the addition of charcoal, as well as in media supplemented with plant growth regulators. Seedlings and callus were successfully developed in the basal modified MS medium and in the MS medium containing a combination of 0.5 mg/l NAA and 1.0 mg/l BAP. The multiplication of callus was observed when callus

sections were subcultured in MS medium containing 1.0 mg/l and 2.0 mg/l BAP. Significant root and shoot development, along with leaf formation, was seen on the basal modified MS medium. Moreover, media supplemented with charcoal produced better rooting and shoot growth compared to the basal MS medium without charcoal.

THE ROLE OF ARTIFICIAL INTELLIGENCE AND CHATGPT IN MODERN SOCIETY

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Artificial Intelligence (AI) has emerged as a transformative force in modern society, revolutionizing various domains such as education, healthcare, business, and governance. Among AI-driven advancements, ChatGPT has gained significant prominence as a powerful language model capable of generating human-like responses, enhancing communication, and streamlining complex tasks. This paper explores the role of AI, particularly ChatGPT, in shaping contemporary society by examining its applications, benefits, and challenges. The widespread integration of AI in education has led to personalized learning experiences, automated assessments, and improved student engagement. ChatGPT, in particular, has been instrumental in tutoring, content generation, and language translation, making knowledge more accessible to diverse learners. In the business sector, AI-driven chatbots have enhanced customer service, optimized decision-making, and streamlined workflow automation, leading to increased efficiency and cost-effectiveness. Similarly, in healthcare, AI models assist in diagnosis, patient monitoring, and medical research, improving overall healthcare outcomes. Despite its advantages, AI and ChatGPT also present ethical and social concerns. Issues such as misinformation, data privacy, bias in AI models, and the potential loss of human jobs necessitate a balanced approach to AI implementation. The paper discusses regulatory frameworks and ethical considerations required to ensure responsible AI development and deployment. Furthermore, the study examines the evolving relationship between AI and human intelligence, emphasizing the need for human oversight to mitigate risks associated with AI-generated content. As AI continues to advance, fostering digital literacy and ethical AI use becomes imperative for individuals, institutions, and policymakers. In conclusion, AI and ChatGPT are reshaping modern society, offering unparalleled benefits across multiple sectors. However, their responsible and ethical use is crucial to mitigating potential risks. This paper provides insights into the evolving role of AI in

society, emphasizing the importance of regulations, digital awareness, and human-AI collaboration to harness its full potential for sustainable development.

MULTIFACETED USES OF CLOVE (*SYZYGIUM AROMATICUM*): MEDICINAL, CULINARY, AND INDUSTRIAL APPLICATIONS

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Clove (*Syzygium aromaticum*), a highly valued spice, has been widely used for centuries in traditional medicine, culinary applications, and industrial sectors. This paper explores the diverse uses of clove, emphasizing its medicinal, culinary, and industrial significance. Clove is renowned for its potent antimicrobial, antioxidant, and anti-inflammatory properties, primarily due to its active compound, eugenol. It has been extensively utilized in traditional medicine for treating dental pain, digestive disorders, respiratory ailments, and infections. In modern medicine, clove oil is incorporated into dental care products, analgesics, and antiseptic formulations. Beyond medicinal applications, clove is a crucial ingredient in global cuisines, enhancing the flavor and aroma of food and beverages. It is used in spice blends, confectionery, and beverages like tea and mulled wine. The preservative properties of clove also extend its role in food preservation. Additionally, clove's essential oil is widely used in the perfume, cosmetic, and pharmaceutical industries. It serves as a natural preservative, fragrance enhancer, and therapeutic agent in aromatherapy and skincare products. The agricultural and economic importance of clove is significant, as it is cultivated in tropical regions, primarily in Indonesia, India, Madagascar, and Sri Lanka. The global demand for clove continues to rise due to its diverse applications in various industries. However, challenges such as climate change, deforestation, and fluctuating market prices impact its production and sustainability. This study highlights the need for further research into the pharmacological properties of clove, exploring its potential in drug development and sustainable agriculture. The antimicrobial and insecticidal properties of clove also present opportunities for eco-friendly alternatives in agriculture and pest control. With its multifaceted benefits, clove remains an invaluable natural resource, contributing to health, industry, and economic growth. Future research should focus on optimizing its cultivation, processing, and applications for a sustainable and economically viable future.

FLOOD RISK ASSESSMENT OF PURSURAH BLOCK, HOOGHLY DISTRICT, WEST BENGAL

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The occurrence of floods in tropical regions during the monsoon period is a very common phenomenon. The study area, Pursurah community development block of Hooghly district, located in the interfluve region of Damodar and Mundeswari, suffers from floods every year, mainly due to the overflowing of the Damodar and its tributaries. Excessive and sudden water release by D.V.C. from the upper catchment dam of the Damodar instigated the situation and turned it into a more vibrant flooding event, along with various other demographic agents. The most anticipated aftermath of the flood found out here are major economic losses and property damages. The study is embedded in investigating the flood risk tendency of this area in terms of hazard assessment and four vulnerable components, namely, population density, child population (0–6 years), sex ratio, and cultivators and agricultural laborers. The recent progress in flood management systems is also highlighted in brief for a better understanding of future flood prospects in the Pursurah Block region.

QUALITY OF WORKLIFE IN DIGITAL ECONOMY: A STUDY OF WOMEN EMPLOYEES IN THE BANKING SECTOR

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Quality of Work Life(QWL) indicates the quality of relationship the employees have with their work environment. An individual's perception or assessment of his quality of work life arises from a comparison of his expectations about his working environment to what he perceives to be the reality. However we find that the emphasis on most of the studies was always on the QWL of the employees in an organization. The quality of work-life gradually takes precedence over the world, and research into the field is on the rise. This paper gives an overview on the issues of the quality of the work-life and digital economy. The various analysis is limited by the most

significant works related to human resource management in companies and making managerial decisions that directly affect the quality of work life. Most women employees spent almost ten hours a day at their workplace and how they perceive and react to what happens in their working environment has a great impact on their quality of work life. Studies proved that it is very difficult to maintain a balance between work life and family life of womens. As we know that grievance management is essential for every organization. Grievance management made a significant impact on workplace justice, quality of life and psychological well-being. The paper deals with discussions around the digital economy and its impact on the quality of work-life issues.

BIOFERTILIZERS – A SUSTAINABLE APPROACH TO SOIL FERTILITY AND CROP PRODUCTIVITY

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Agricultural sustainability is a growing concern in modern farming due to excessive dependence on chemical fertilizers, which lead to soil degradation, water pollution, and environmental imbalances. Biofertilizers, derived from living microorganisms such as bacteria, fungi, and cyanobacteria, offer an eco-friendly alternative to enhance soil fertility and crop productivity. These natural inputs improve plant nutrient availability, promote root growth, and enhance resistance to pests and diseases while maintaining soil health. Biofertilizers function through biological nitrogen fixation, phosphorus solubilization, and the production of plant growth-promoting substances. Rhizobium, Azotobacter, Azospirillum, and phosphate-solubilizing bacteria (PSB) are some of the key microbial inoculants used as biofertilizers. These microorganisms establish symbiotic or associative relationships with plants, enriching soil fertility and reducing the dependency on synthetic fertilizers. Additionally, mycorrhizal fungi form mutualistic associations with plant roots, improving nutrient absorption, particularly phosphorus and micronutrients, from the soil. The application of biofertilizers contributes significantly to sustainable agriculture by improving soil structure, increasing organic matter content, and reducing the negative impacts of chemical fertilizers. Moreover, biofertilizers help mitigate greenhouse gas emissions, as they reduce the excessive use of nitrogen-based fertilizers, which contribute to nitrous oxide emissions. Their role in enhancing soil microbial diversity ensures long-term agricultural productivity. Despite their advantages, the widespread adoption of biofertilizers faces challenges, such as

variability in field performance, limited shelf life, and lack of awareness among farmers. Research and development efforts are needed to improve the formulation, storage, and application methods of biofertilizers for their effective utilization. Government initiatives, farmer education, and policy support can further promote their use in large-scale farming. This paper reviews the types, mechanisms, benefits, and challenges of biofertilizers, emphasizing their role in sustainable agriculture. With the increasing global demand for organic farming and environmentally friendly practices, biofertilizers offer a promising solution to enhance soil fertility, crop yield, and overall agricultural sustainability. The integration of biofertilizers with modern farming techniques can revolutionize agriculture by ensuring food security and environmental conservation for future generations.

ANALYSIS OF NON-MOTORIZED VEHICLE TRAFFIC ON TWO-LANE HIGHWAYS

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In countries like India, road networks experience mixed traffic conditions, where motorized and non-motorized vehicles (NMVs) share the same roadway. NMVs, including bicycles, rickshaws, and handcarts, form a significant portion of traffic, especially during peak hours. Their presence influences key traffic parameters such as speed, density, and flow, making traffic analysis and road design more complex. Understanding the behavior of NMVs in a mixed traffic stream is essential for efficient traffic management and infrastructure planning. This study focuses on analyzing the impact of NMVs on traffic characteristics under mixed traffic conditions. The research is divided into two major components: an experimental study and statistical analysis. The experimental phase involves collecting and analyzing real-world traffic data from different locations in Rourkela City. Key aspects such as fundamental traffic flow diagrams, roadway capacity, and lateral lane occupancy are examined. The findings indicate that an increase in NMV presence leads to disruptions in traffic flow, reducing average speed and altering traffic density patterns.An analysis of lateral lane occupancy reveals distinct traffic behavior in different roadway configurations. In one-way divided roads, NMVs predominantly occupy the leftmost lanes, while motorized vehicles (MVs) utilize the rightmost lanes for smoother movement and overtaking, following India's left-hand driving system. Conversely, in undivided two-way traffic, most vehicles tend to concentrate in the

central portion of the road, while the extreme left and right lanes are less utilized due to opposing traffic flows. The study highlights the critical role NMVs play in shaping traffic dynamics and emphasizes the need for improved road designs that accommodate mixed traffic conditions. These insights can contribute to more effective traffic management strategies, ensuring safer and more efficient transportation systems. This study includes a statistical comparison of traffic parameters in Rourkela City between 2011 and 2014. Hypothesis testing was performed to analyze variations in traffic flow, speed, and the proportion of non-motorized vehicles (NMVs) over time. The analysis aimed to determine whether significant changes occurred in traffic characteristics.The hypothesis testing procedure followed a structured four-step approach.The first step is of Formulating the Null Hypothesis – Establishing an assumption that there is no significant difference between the two datasets.The second one is of Computing the Test Statistic – Calculating the Z-score to compare the means of the observed samples.The next is of Determining the P-Value – Assessing the statistical significance of the observed variations and the last one is of Drawing Conclusions and Decision Making – Interpreting the results based on the Z-score and P-value to accept or reject the null hypothesis. The findings indicate a decline in the percentage of NMVs from 2011 to 2014, alongside an increase in both traffic speed and flow. These changes suggest a shift in travel patterns, possibly due to urban development, improved infrastructure, and a growing preference for motorized transportation.

ADVANCED TRAFFIC SIGNAL OPTIMIZATION: INTEGRATING APPROACH ROAD WIDTH REDUCTION INTO SATURATION FLOW MODELLING USING WEBSTER'S METHOD

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Saturation flow is a critical parameter in traffic engineering, representing the maximum traffic volume that can pass through an intersection under uninterrupted green signal conditions. It is typically measured in Passenger Car Units (PCU) per hour of green time and is influenced by several factors, including intersection geometry, approach road width, turning movements, commercial vehicle presence, and roadside obstructions such as parked vehicles. This study focuses on the impact of approach road width reduction due to roadside parking near signalized

intersections in Visakhapatnam. Observations were conducted at three major intersections—Asilmetta Junction, RTC Complex Junction, and Sangam Sarath Junction—to assess how parked vehicles affect available road width and, consequently, saturation flow. The findings highlight the need for adjustments in the traditional saturation flow formula to account for width reduction, ensuring a more accurate estimation of traffic capacity at busy intersections. By incorporating these modifications, the study aims to enhance traffic signal optimization and improve overall intersection efficiency in urban environments.

MULTIFUNCTIONAL APPAREL DESIGNING APPROACH BASED UPON ECO-FASHION DESIGN NORMS AND ZERO WASTE CONCEPT: A STUDY IN CONTEXT WITH INDIAN CHILDREN WEAR MARKET

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Children's clothing is a noteworthy area of the fashion business that contributes significantly to environmental degradation because of the fast growth rates that require frequent garment changes. As a result, more resources are used and more textile waste is produced. Innovative strategies that blend sustainability with pragmatism are needed to address these issues. In order to reduce environmental effect and meet the changing requirements of kids, this research study investigates the design and development of sustainable, multipurpose children's apparel using zero-waste principles. Children's quick development leads to a high garment turnover rate, which adds significantly to textile waste. Traditional methods for designing and making clothes can result in large amounts of fabric waste, which exacerbates environmental issues. In response to these concerns, sustainable fashion has surfaced, focusing on waste minimization, ethical production, and environmentally favourable materials. Specifically, zero-waste design, which removes textile waste during the design phase, has drawn interest because to its potential to lessen the environmental impact of clothing manufacturing. Nonetheless, not enough research has been done on the use of zero-waste concepts in children's apparel. Furthermore, adding multifunctionality to children's clothing can increase its usefulness and benefit customers in both practical and financial ways. By creating multipurpose, sustainable children's apparel designs that follow zero-waste principles, our research aims to close these gaps.

APPLICATIONSOF MODIFIED MULTIFERROIC MATERIALS INTO HIGH CAPACITY ENERGY STORAGE AND ELECTROMAGNETIC SHIELDING DEVICES

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Modified multiferroic materials, such as rare earth Pr^{3+}, Dy^{3+}, Eu^{3+}-substituted $BiFeO_3$ nanoferrites, have exhibited improved dielectric and magnetic properties, making them suitable for high-capacity energy storage applications.Pr^{3+}, Dy^{3+}, Eu^{3+}-substitution in BFO ceramics has been found to induce structural distortions in the FeO_6ctahedra without causing a phase transformation up to a certain doping level. This substitution results in weak ferromagnetic hysteresis loops, with the maximum remnant magnetization observed at specific doping concentrations. The weak ferromagnetism is attributed to the suppression of the spiral spin structure and the magnetic characteristics of Pr^{3+}, Dy^{3+}, Eu^{3+} ions, along with ferromagnetic coupling between Pr^{3+}-Fe^{3+}, Dy^{3+}-Fe^{3+}, Eu^{3+}-Fe^{3+} ions. Additionally, they exhibit optical band gaps in the visible region, suggesting potential applications in optoelectronic devices and solar cells. Morover, multiferroics are explored for tunable microwave absorbers, useful in stealth technology and electromagnetic interference (EMI) shielding. EMI devices are crucial in industries such as aerospace, telecommunications, medical equipment, and consumer electronics. Magnetoelectric coupling in materials like $BiFeO_3$ and hexaferrites allows dynamic control over absorption frequencies.These applications demonstrate how multiferroic materials are pushing the boundaries of next-generation electronics and energy systems.

OPTIMIZING CONCRETE STRENGTH WITH RICE HUSK ASH AND MARBLE DUST COMPOSITES

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The rising demand for concrete has intensified cement consumption, leading to environmental concerns such as resource depletion and increased greenhouse gas emissions, with cement production contributing approximately 7% of global CO_2emissions. To address thesechallenges, sustainable alternatives incorporating industrialand agriculturalwaste materials have gained prominence. This study

explores **Self-Compacting Concrete (SCC)**, a highly flowable and self-consolidating material that eliminates the need for mechanical compaction, making it ideal for complex structures and congested reinforcements. The research focuses on partially replacing cement with **Rice Husk Ash (RHA)**, apozzolanic byproduct rich in amorphous silica, and **Marble Dust (MD)**, a waste product from the marble industry, both of which enhance concrete strength and durabilitywhile mitigating disposal issues. The studyevaluates the effects of varying RHA and MD proportions (5%–35%) on the mechanical properties of **M40-grade concrete**, assessing workability, compressive strength, and durability through a series of laboratory tests. Additionally, **super plasticizers** are incorporated to improve SCC'sperformance by reducing water content while maintaining cohesion and flow ability. Thefindings aim to establish the optimal mix ratio for enhanced structural integrity, sustainability, andcost efficiencyinconcreteproduction.Byintegratingwaste materialsinto SCC,thisresearch promotes **eco-friendly construction practices, resource conservation, and reduced environmental impact**, aligning with modern sustainability goals.

RAJASTHANI CULTURE: A TAPESTRY OF TRADITION, HERITAGE, AND IDENTITY

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Rajasthan, the land of kings, is renowned for its rich cultural heritage, vibrant traditions, and historical significance. The state's culture is a blend of Rajput valor, folk traditions, religious diversity, and artistic excellence, making it a unique representation of India's historical legacy. This paper explores the various dimensions of Rajasthani culture, including its folk music, dance forms, festivals, cuisine, attire, and architectural marvels. One of the most striking aspects of Rajasthani culture is its music and dance, which reflect the emotions, struggles, and joys of the people. Traditional dance forms like Ghoomar, Kalbeliya, and Kathputli, along with soulful folk music such as Maand and Bhopa, are integral to the state's identity. These art forms not only entertain but also serve as a medium of storytelling, preserving historical events and social messages. Rajasthan's festivals, such as Teej, Gangaur, Pushkar Fair, and the Desert Festival, showcase the spirit of celebration and devotion among its people. These festivals are deeply rooted in local traditions and attract tourists from across the world, contributing significantly to cultural tourism. The state's cuisine, including Dal Baati Churma, Gatte ki Sabzi, and Ker Sangri, reflects its arid geography and the ingenious use of locally available ingredients. The traditional attire of Rajasthan,

characterized by vibrant colors and intricate embroidery, is a visual representation of its cultural richness. Men wear turbans (pagris), and women adorn themselves in lehengas and odhnis, often decorated with mirror work and bandhani prints. Architectural heritage is another hallmark of Rajasthani culture, with magnificent forts, palaces, and temples standing as testimonies to the state's glorious past. Structures like Amer Fort, Mehrangarh Fort, and City Palace exhibit Indo-Islamic and Rajputana architectural styles, drawing history enthusiasts and researchers alike. Despite modernization, Rajasthan has preserved its cultural essence through continued patronage of traditional arts and practices. This paper aims to provide an in-depth analysis of Rajasthani culture, highlighting its significance in India's cultural landscape and its impact on tourism, identity, and heritage conservation. Understanding this cultural wealth is crucial for appreciating the historical and artistic contributions of Rajasthan to Indian civilization.

THE ROLE OF ORGANIC FARMING IN SOIL HEALTH AND BIODIVERSITY PRESERVATION

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Organic farming has emerged as a sustainable agricultural practice that enhances soil health and preserves biodiversity while reducing environmental degradation. This paper explores the critical role of organic farming in maintaining soil fertility and supporting diverse ecosystems. Unlike conventional farming, which relies heavily on synthetic fertilizers and pesticides, organic farming emphasizes natural inputs, crop rotation, composting, and biological pest control. These practices not only improve soil structure and nutrient content but also enhance microbial diversity, leading to long-term soil productivity. Soil health is a key determinant of agricultural sustainability. Organic farming improves soil organic matter, increases water retention capacity, and enhances microbial activity, thereby reducing soil erosion and degradation. The absence of synthetic chemicals minimizes soil contamination, ensuring a healthier environment for plant growth. Additionally, organic farming fosters carbon sequestration, contributing to climate change mitigation. Biodiversity preservation is another significant advantage of organic farming. The reduction of chemical inputs and the promotion of diverse cropping systems create a balanced ecosystem where beneficial organisms, such as pollinators and natural predators, thrive. The avoidance of monoculture farming further supports habitat conservation and protects endangered species. Studies indicate that organically managed farms

host higher species diversity than conventionally managed farms, making them vital for ecological balance. Despite its numerous benefits, organic farming faces challenges, including lower initial yields, higher labor requirements, and limited market access. However, with increasing consumer awareness and supportive policies, organic farming has the potential to transform modern agriculture. Technological advancements, farmer education, and government incentives can further promote its adoption, ensuring long-term sustainability. This paper highlights the ecological and economic importance of organic farming in enhancing soil health and biodiversity. By prioritizing organic methods, agriculture can move towards a more resilient and environmentally friendly future. The findings of this study underscore the need for widespread adoption of organic farming techniques to ensure food security, environmental conservation, and sustainable development.

THE ROLE OF WOMEN IN MEDIEVAL INDIAN SOCIETY: STATUS, CHALLENGES, AND CONTRIBUTIONS

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Women in medieval Indian society occupied a complex and dynamic position, shaped by social, religious, and political structures. This paper explores the status, challenges, and contributions of women during the medieval period, highlighting their roles in various spheres such as administration, economy, literature, and culture. While societal norms often restricted women's autonomy, historical evidence reveals their resilience and influence in shaping medieval India. The status of women varied significantly across regions and communities. In certain ruling dynasties, such as the Rajputs, Mughals, and the Deccan Sultanates, royal women played crucial roles in governance, diplomacy, and warfare. Queens like Rani Durgavati, Chand Bibi, and Nur Jahan demonstrated exceptional leadership and strategic acumen. However, for the majority of women, life was governed by patriarchal traditions, limiting their education, mobility, and economic independence. Practices such as purdah, child marriage, and sati became prevalent, further restricting their rights. Despite these challenges, women made remarkable contributions to medieval Indian society. Bhakti and Sufi movements provided a spiritual platform that transcended caste and gender barriers, allowing female saints like Mirabai, Akka Mahadevi, and Rabia Basri to express their devotion and challenge societal norms. Women also contributed significantly to literature, art, and architecture, as seen in the poetry of Lal Ded and the patronage of monuments by Mughal queens. The paper also examines the impact

of socio-religious reforms and foreign influences on women's roles. While Persian and Islamic traditions introduced new forms of education and social customs, the rigid caste system and orthodox Brahmanical traditions often curtailed women's rights. However, economic participation remained evident in weaving, pottery, and trade, where women played an essential yet often overlooked role. By analyzing historical records, inscriptions, and literary works, this study highlights the dual reality of medieval Indian women—where oppression coexisted with agency and resilience. The paper argues that understanding this historical context is essential for appreciating the progress and persistent challenges faced by women in contemporary India.

ACCELERATING PRODUCTIVITY BY STEERING THROUGH RESILIENCE AT WORK: AN ORGANIZATIONAL PERSPECTIVE

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By the term Organizational Resilience, we mean the company who will adapt, recover and continue functioning effectively despite challenges such as economic downtowns, global crisis or technological changes. Through this paper we would like to show the impact of organizational resilience on employee productivity and the output of workers in achieving organizational goals. Through a qualitative analysis this paper argues that resilience actually enhances productivity of an employee of an organization by providing stability, fostering adaptability and support employee wellbeing. To mitigate uncertainty and stress resilient organizations enable employees to focus on their task while the organization who have adaptive culture encourage innovation and flexibility which will eventually boost individual performance. In a resilient organization one of the critical roles is played by leadership which prioritises workforce health which will prevent burnout and disengagement. However, if the changes are extreme then it can risk fatigue which will underscore the need for balance. Similar studies have shown that to preserve productivity in an organization, organizational resilience plays an important role and during crucial times it amplifies it in long-term, positioning it as a key driver of success. Through this paper we have

shown the give and take policy between organizational strength and employee output in dynamic environments.

THE ROLE OF ENDOCRINE REGULATION IN ANIMAL GROWTH AND DEVELOPMENT

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The endocrine system plays a crucial role in regulating animal growth and development through the coordinated action of hormones. This paper explores the complex interactions between endocrine glands, hormones, and target tissues that influence physiological processes such as growth, metabolism, reproduction, and homeostasis. Key endocrine glands, including the pituitary, thyroid, adrenal, and gonads, secrete hormones that regulate cellular and systemic functions essential for development. Growth hormone (GH), secreted by the pituitary gland, is a primary regulator of somatic growth, influencing protein synthesis, cell proliferation, and skeletal development. Its interaction with insulin-like growth factors (IGFs) further modulates tissue differentiation and organ development. Thyroid hormones (T3 and T4) play a pivotal role in metabolic rate regulation, thermogenesis, and neurological development, particularly in early life stages. Additionally, corticosteroids secreted by the adrenal glands help in stress adaptation, immune response modulation, and energy metabolism. The regulation of growth and development is also significantly influenced by reproductive hormones, such as estrogen, testosterone, and progesterone, which govern sexual maturation, secondary sexual characteristics, and reproductive functions. Disruptions in endocrine signaling due to environmental factors, genetic mutations, or endocrine-disrupting chemicals (EDCs) can lead to developmental disorders, growth abnormalities, and metabolic imbalances in animals. Recent advancements in endocrine physiology have provided insights into the molecular mechanisms governing hormone action, paving the way for improved livestock management, aquaculture practices, and conservation strategies. Understanding endocrine regulation is also critical for addressing issues related to animal breeding, disease resistance, and climate-induced physiological stress. This review highlights the intricate hormonal networks controlling animal growth and development, emphasizing their physiological significance and applications in veterinary science, agriculture, and wildlife management. Further research into endocrine modulation can contribute to enhancing animal productivity, health, and adaptation to changing environmental conditions.

MEDICINAL PLANTS: PHYTOCHEMICAL PROPERTIES, THERAPEUTIC POTENTIAL, AND CONSERVATION CHALLENGES

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Medicinal plants have played a crucial role in traditional and modern healthcare systems worldwide. These plants, rich in bioactive compounds, offer therapeutic benefits for various ailments and have been the foundation of many pharmaceutical drugs. This study explores the medicinal properties, phytochemical constituents, and pharmacological significance of commonly used medicinal plants. The research highlights the traditional knowledge associated with these plants, their role in primary healthcare, and their scientific validation through phytochemical and pharmacological studies. The increasing demand for natural and herbal remedies has driven extensive research into the efficacy and safety of medicinal plants. Various bioactive compounds, including alkaloids, flavonoids, terpenoids, and polyphenols, contribute to their medicinal properties. These compounds exhibit antimicrobial, anti-inflammatory, antioxidant, and anticancer activities, making medicinal plants valuable for drug discovery and development. This paper also addresses the challenges and opportunities in the utilization of medicinal plants, including issues related to conservation, sustainable harvesting, and standardization of herbal medicines. Overharvesting and habitat destruction have led to the decline of many valuable medicinal plant species, necessitating the implementation of conservation strategies and cultivation programs. Moreover, the lack of standardization in herbal medicine formulations poses challenges in ensuring safety, efficacy, and quality control. Furthermore, advancements in biotechnology, including plant tissue culture and genetic engineering, provide new avenues for enhancing the production of medicinal compounds. The integration of traditional knowledge with modern scientific approaches can lead to the development of novel therapeutic agents. In conclusion, medicinal plants continue to be a valuable source of natural remedies with immense potential for the pharmaceutical industry. Further research, conservation efforts, and regulatory frameworks are essential to maximize their benefits while ensuring sustainability. This study emphasizes the need for a multidisciplinary approach to explore the full potential of medicinal plants in modern medicine.

EXPLORING THE INTERSECTION OF AGRICULTURE AND TOURISM: A STUDY OF AGRITOURISM IN WAYANAD DISTRICT

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In Wayanad, Kerala agritourism by combining traditional agriculture and tourism, has become a viable strategy to improve farmers' livelihoods. A Likert scale questionnaire was given to 200 farmers who were chosen through a stratified sampling technique in order to evaluate the economic, social, and environmental effects of agritourism, and to assess the efficacy of policies, and identify obstacles. Although obstacles like resource limitations and cultural disruptions still exist, the results showed notable economic benefits, with 58% acknowledging its role in environmental protection and 65% reporting improved income. The study concludes that, with the help of infrastructure, training, and government regulations, agritourism provides a viable route for rural development. Future studies can concentrate on long-term sustainability and technology integration to support agritourism in comparable rural settings.

THE HISTORY AND CULTURAL SIGNIFICANCE OF RAJASTHAN'S FORTS AND PALACES

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Rajasthan, known as the "Land of Kings," boasts a rich architectural and cultural heritage reflected in its magnificent forts and palaces. These grand structures, built by Rajput, Mughal, and British rulers, serve as enduring symbols of the region's history, valor, and artistic excellence. This paper explores the historical evolution, architectural brilliance, and cultural significance of Rajasthan's forts and palaces, focusing on their role in shaping the identity of the state. The research traces the origins of fortifications in Rajasthan from the medieval period, highlighting the strategic importance of prominent forts such as Chittorgarh, Kumbhalgarh, Mehrangarh, and Ranthambore. These forts not only served as military strongholds but also stood as testaments to Rajput bravery and resilience against invasions. The paper also delves into the intricate designs, artistic embellishments, and fusion of Rajput, Mughal, and Persian architectural styles in the region's palaces, such as the City Palace (Jaipur and Udaipur), Hawa Mahal, and Umaid Bhawan Palace. Beyond their architectural splendor, these monuments hold immense cultural significance. They have been centers of power, governance, and cultural patronage, fostering art, music, and

literature. Many forts and palaces have been recognized as UNESCO World Heritage Sites, emphasizing their global historical value. Furthermore, their transformation into museums and heritage hotels has contributed to Rajasthan's thriving tourism industry, preserving history while generating economic benefits. This paper adopts a multidisciplinary approach, incorporating historical records, architectural analysis, and cultural perspectives to highlight the enduring legacy of Rajasthan's forts and palaces. By understanding their historical narratives and cultural roles, we can appreciate their importance in India's rich heritage and the need for continued conservation efforts. Rajasthan's forts and palaces are not merely remnants of the past; they are living chronicles that continue to inspire and define the region's identity.

CIRCULAR ECONOMY PRINCIPLES IN SUSTAINABLE TOURISM DEVELOPMENT: A CRITICAL ANALYSIS OF OPPORTUNITIES, CHALLENGES, AND PATHWAYS IN THE INDIAN CONTEXT

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The concept of circularity, rooted in the principles of the circular economy, has emerged as a transformative approach to achieving sustainable tourism development. This article critically examines the role of circularity in the tourism sector, with a specific focus on the Indian context. By analyzing the potential of circular practices to minimize environmental degradation, promote economic inclusivity, and preserve cultural heritage, the study highlights the opportunities for integrating circular economy principles into India's tourism industry. Key areas of exploration include sustainable accommodation, circular transportation, eco-tourism, and community-based tourism initiatives. The article also identifies significant challenges, such as lack of awareness, infrastructure gaps, policy barriers, and economic constraints, that hinder the adoption of circular practices. Through case studies of successful circular tourism initiatives in India, such as the Spiti Ecosphere, the Barefoot College, and the Kabini River Lodge, the study demonstrates the feasibility and benefits of circularity in tourism. The article concludes with actionable recommendations for stakeholders, including governments, businesses, tourists, and local communities, to promote circular tourism. These include increasing awareness, developing supportive policies, investing in infrastructure, fostering collaboration, and encouraging sustainable consumer behavior. By addressing these challenges and leveraging the opportunities, India can position itself as a global leader in sustainable tourism, setting a precedent for other nations. This study contributes to the growing discourse on sustainable tourism and

offers a roadmap for integrating circular economy principles into the tourism sector, ensuring long-term environmental, social, and economic benefits.

DETERMINANTS OF INVESTMENT BEHAVIOUR OF INVESTORS TOWARDS ENVIRONMENTAL, SOCIAL,GOVERNANCE (ESG) FUNDS IN INDIA

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Environmental, Social, and Governance (ESG) investing has gained significant traction in recent years, driven by increasing awareness of sustainability and ethical considerations among investors. This study explores the key determinants influencing investor behavior towards ESG funds, analyzing factors such as financial performance expectations, risk perception, ethical orientation, regulatory influence, and social awareness. Using a combination of qualitative and quantitative research methods, the study identifies that demographic factors, such as age, income level, and education, also play a crucial role in shaping investment preferences. Furthermore, trust in ESG ratings, corporate transparency, and the perceived trade-off between sustainability and returns are critical determinants of investment decisions. The findings provide insights for financial institutions, policymakers, and fund managers to develop strategies that enhance investor confidence in ESG funds, ultimately promoting sustainable investment practices.

CONTRACT FARMING AND ITS SOCIO-ECONOMIC RAMIFICATIONS: AN IN-DEPTH ANALYSIS OF POTATO FARMERS IN HOOGHLY DISTRICT, WEST BENGAL

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This study investigates the intricate relationship between contract farming and its socio-economic implications, focusing on potato farmers in Hooghly District, West Bengal. The backdrop of this research is the significant shift in the agri-processing industry induced by globalization. Changes in consumer preferences, the dominance of large retail chains, and the quest for standardization across the value chain have propelled the corporatization of agriculture. Corporations, seeking to optimize their supply chains, have introduced contract farming, initially in developed nations and subsequently extending to developing countries grappling with institutional voids. The

diminishing contribution of agriculture to GDP in many developing countries poses a challenge, despite its role as a primary livelihood source for a substantial portion of the population. This study aims to assess whether contract farming can act as a catalyst for change in this scenario. To address this question, an in-depth analysis is undertaken to understand the impact of contract farming on the economic well-being of potato farmers in Hooghly District. Key variables influencing participation in contract farming are identified, shedding light on the factors shaping the farmer's decision-making process. Through a comprehensive examination of economic empowerment, technology adoption, market access, rural development, and environmental sustainability, the study aims to provide nuanced insights. It considers the broader socio-cultural implications and evaluates the role of government policies and regulatory frameworks in shaping the contract farming landscape. Additionally, the study explores risk management strategies within contract farming agreements and their contribution to farmer resilience in the face of economic uncertainties. The findings from this research contribute to a deeper understanding of the potential of contract farming to bring about positive socio-economic changes in the lives of potato farmers in Hooghly District. The insights generated may inform policy decisions and promote sustainable agricultural practices, ensuring a balanced and resilient agricultural ecosystem that benefits both farmers and the broader community.

EXAMINING THE INFLUENCE OF GREEN TECHNOLOGY ON CONSUMER SHOPPING BEHAVIOR: A COMPARATIVE STUDY OF ONLINE AND OFFLINE APPAREL PREFERENCES IN INDIA

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In recent years, green technology has emerged as a critical factor in reshaping consumer shopping behavior, particularly in the apparel industry. This paper aims to examine how the implementation of green technologies influences consumer purchasing decisions in both online and offline apparel markets in India. The research focuses on understanding how green technology initiatives, such as sustainable production practices, eco-friendly packaging, and energy-efficient logistics, affect consumer preferences and their perceptions of environmental responsibility. The

study adopts a comparative approach, analyzing the differences in online and offline consumer behavior with respect to green technology adoption. The research uses a mixed-methods approach, incorporating both qualitative and quantitative data. A survey was conducted among 500 Indian consumers, split between online and offline shoppers, to gauge their awareness of green technology in apparel retail, their purchasing preferences, and the perceived importance of sustainability in their shopping decisions. Additionally, interviews were conducted with industry experts and retailers to gain deeper insights into the operational aspects of green technology adoption in the apparel sector. Findings suggest that while both online and offline consumers are increasingly aware of green technology and sustainability, their preferences and responses differ significantly. Online consumers are more likely to engage with sustainable brands due to the convenience of information access and the prominence of eco-friendly certifications. In contrast, offline shoppers show more skepticism towards the green claims of retailers and are less influenced by technological advancements in sustainability. The study concludes that while green technology is influencing consumer behavior, the level of impact varies based on the shopping medium, highlighting the need for targeted strategies in promoting sustainability in both online and offline apparel markets.

SENTIMENT ANALYSIS FOR DEFI MARKETS: AN NLP-BASED APPROACH

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Decentralised Finance (DeFi) has emerged as a disruptive force in the financial industry, enabling financial transactions without intermediaries and is a system build on block chain.However, the volatility and rapid evolution of DeFi markets are heavily influenced by public sentiment, news, and social media discussions. This research work uses the data set financial sentiment analysis taken from kaggle. This paper explores the application of Natural Language Processing (NLP) techniques for sentiment analysis in DeFi markets. The study aims to provide insights into how sentiment affects DeFi asset prices and trading volumes, offering potential predictive capabilities for investors and researchers.

EMPOWERING WOMEN IN HYBRID WORK MODE

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The emergence of hybrid work models has revolutionised traditional workplace dynamics, presenting both opportunities and challenges for women in the workforce. This paper examines how hybrid work environments can empower women by promoting flexibility and supporting a healthier work-life balance. By integrating remote and in-office work, women can better navigate personal and professional responsibilities, allowing for increased autonomy in managing their time and commitments.The research highlights critical factors that contribute to the empowerment of women in hybrid settings, such as organizational support, inclusive leadership, and tailored policies. Organizations that prioritize mentorship programs, provide resources for professional development, and implement flexible working policies are more likely to create an empowering atmosphere. This environment not only enhances women's job satisfaction but also fosters a culture of equity and collaboration.Through qualitative interviews with women from various industries, this study captures real-life experiences and strategies that facilitate empowerment in hybrid roles. The narratives reveal that many women have successfully harnessed the advantages of hybrid work to reclaim control over their careers, often leading to innovative approaches in balancing their work and home life. However, the study also uncovers ongoing challenges, including isolation, communication barriers, and the potential for overwork in remote settings.In conclusion, the findings from this research advocate for a comprehensive approach to hybrid work that places women's empowerment at the forefront. By recognizing and addressing the unique needs of women in these environments, organizations can enhance overall productivity, foster talent retention, and build a more inclusive workplace culture. As the nature of work continues to evolve, empowering women in hybrid work modes is not just beneficial for individual employees but also vital for the long-term success and sustainability of organizations in a rapidly changing world.

THERAPEUTIC POTENTIAL AND MEDICINAL USES OF WITHANIA SOMNIFERA: A COMPREHENSIVE REVIEW

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Withania somnifera, commonly known as Ashwagandha or Indian ginseng, is a renowned medicinal herb widely used in Ayurveda, the traditional Indian system of medicine. This plant, belonging to the Solanaceae family, has been extensively studied for its pharmacological properties, including adaptogenic, anti-inflammatory, antioxidant, neuroprotective, and immunomodulatory effects. The bioactive compounds present in Withania somnifera, particularly withanolides, alkaloids, and flavonoids, contribute to its therapeutic potential. The primary uses of Withania somnifera span across multiple health domains. It is widely used as an adaptogen to help the body combat stress, anxiety, and fatigue. Studies suggest that its active components modulate the hypothalamic-pituitary-adrenal (HPA) axis, thereby regulating cortisol levels and promoting overall mental well-being. Additionally, its neuroprotective properties make it a promising candidate for managing neurodegenerative disorders like Alzheimer's and Parkinson's disease. In the realm of physical health, Withania somnifera has shown significant effects in enhancing muscle strength, endurance, and recovery, making it popular among athletes and fitness enthusiasts. It also exhibits anti-inflammatory and analgesic properties, making it useful in managing arthritis and other chronic pain conditions. Furthermore, its immunomodulatory effects strengthen the immune system, aiding in the prevention and management of infections and autoimmune diseases. Withania somnifera is also gaining attention for its role in metabolic health. Studies indicate its potential in regulating blood sugar levels, improving insulin sensitivity, and reducing cholesterol, thus proving beneficial in managing diabetes and cardiovascular diseases. Additionally, its anti-cancer properties, attributed to withanolides, have been explored for their role in inhibiting tumor growth and inducing apoptosis in cancer cells. Despite its wide range of applications, further clinical research is necessary to validate its efficacy and establish standardized dosages. This review aims to explore the diverse therapeutic uses of Withania somnifera, emphasizing its pharmacological mechanisms and potential future applications in integrative medicine. Given its broad spectrum of benefits, Withania somnifera stands as a valuable herbal remedy with immense promise for modern healthcare and wellness.

AGRICULTURE SECTOR OF INDIA: ISSUES, CHALLENGES, AND FUTURE PROSPECTS.

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Agriculture plays a crucial role in a nation's socio-economic development. A nation's economic development depends on its agriculture sector, which leads to the growth of the industry and services sectors of the economy. The contribution of agriculture and the allied sector to the GDP of India is 16% in the financial year 2024, as per the Economic Survey 2025, and this sector supports 46.1% of the population of the country. The objective of this study is to understand the current status, issues, and challenges prevailing in the agriculture sector of India. This paper also explores the future prospects to revive the agriculture sector of India. Overuse of resources, shrinking size of landholdings, low productivity, and rising input costs are the main obstacles in the agriculture sector of India. It also suggested the ways,like policy reforms, improving market structure, reducing post-harvest losses and empowering farmers to revive the agriculture and allied sector of India.

BIOTECHNOLOGICAL EFFECT FOR ENHANCING SUSTAINABLE AGRICULTURE USING MICROBES

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Biotechnology has emerged as a transformative tool in sustainable agriculture, offering innovative solutions to increase crop productivity, conserve natural resources, and mitigate environmental impacts. As the global population growing and climate change threatens food security, biotechnological advancements provide sustainable alternatives to traditional farming practices. Genetic engineering, including transgenic crops and gene-editing techniques like CRISPR-Cas9, enables the development of drought-resistant, pest-resistant, and nutrient-enriched crop varieties, reducing dependence on chemical fertilizers and pesticides.Microbial biotechnology, through biofertilizers and biopesticides, enhances soil fertility and plant health while minimizing the adverse effects of synthetic agrochemicals. Precision agriculture, powered by biotechnology and digital tools, optimizes resource management by ensuring efficient water and nutrient usage, thereby reducing waste and environmental degradation.

Additionally, plant tissue culture and synthetic biology contribute to the mass propagation of disease-free crops and the development of novel plant-based products.Sustainable agriculture also benefits from biotechnology through the improvement of livestock health and productivity, utilizing genetically modified feed and disease-resistant animal breeds. Furthermore, bioremediation techniques help restore degraded agricultural lands by using microorganisms to break down pollutants and enhance soil structure. Despite these advantages, challenges such as regulatory constraints, ethical concerns, and public perception remain barriers to the widespread adoption of biotechnological innovations in agriculture.This paper explores the diverse applications of biotechnology in sustainable agriculture, analyzing its role in promoting microbialtechnology for food security, reducing environmental footprints, and enhancing resilience against climate change. By integrating biotechnology with ecological farming principles, the agricultural sector can transition towards more sustainable and efficient food production systems. The future of sustainable agriculture depends on interdisciplinary research, policy support, and the acceptance of biotechnological advancements to ensure long-term agricultural productivity while preserving natural ecosystems.

ROLE OF INSECTS IN POLLINATION: A KEY TO SUSTAINABLE AGRICULTURE

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Pollination is a fundamental ecological process essential for maintaining biodiversity and ensuring global food security. Insects, particularly bees, butterflies, beetles, and flies, play a crucial role in pollinating flowering plants, including major agricultural crops. This study explores the significance of insect pollinators in sustainable agriculture, their contribution to crop productivity, and the threats they face due to environmental changes and human activities. Through an extensive review of literature and field observations, this research highlights how insect pollinators enhance crop yields, improve fruit quality, and promote genetic diversity in plant populations. Bees, especially honeybees (*Apis mellifera*) and native wild bees, are identified as the most effective pollinators, responsible for pollinating over 75% of global food crops. The study also examines the role of other insect species, such as butterflies and beetles, in pollination networks. However, insect pollinators are facing severe declines due to habitat destruction, pesticide overuse, climate change, and the spread of invasive species. The disruption of pollination services threatens agricultural sustainability and food production, necessitating urgent conservation efforts. This

paper discusses various strategies to protect and enhance pollinator populations, including habitat restoration, reduction of chemical pesticide usage, and the promotion of agroecological practices. Integrated pest management (IPM) and organic farming techniques are also emphasized as sustainable approaches to minimize the negative impact on pollinators. Furthermore, the study highlights the importance of community awareness and policy interventions in promoting pollinator-friendly agricultural landscapes. Sustainable agriculture depends on the conservation of insect pollinators, making it imperative for farmers, researchers, and policymakers to work together to implement protective measures. Future research should focus on developing innovative pollinator-friendly farming techniques and understanding insect-plant interactions in changing climatic conditions. This study concludes that safeguarding insect pollinators is not only crucial for maintaining biodiversity but also for ensuring long-term food security and sustainable agricultural development.

THE EVOLUTION OF GOVERNANCE IN ANCIENT INDIA: A COMPARATIVE STUDY OF MAURYAN AND GUPTA ADMINISTRATION

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Governance in ancient India underwent significant transformations, with the Mauryan and Gupta empires playing a pivotal role in shaping administrative frameworks. This study examines the evolution of governance during these two influential dynasties, highlighting their administrative structures, policies, and impact on socio-political stability. The Mauryan administration (321–185 BCE), established under Chandragupta Maurya and perfected by Emperor Ashoka, was a highly centralized system marked by a hierarchical bureaucracy, a well-organized spy network, and an emphasis on Dhamma (moral governance). The Arthashastra, authored by Kautilya, served as a foundational text, outlining strategies for taxation, law enforcement, and economic regulation. In contrast, the Gupta administration (319–550 CE) transitioned towards a decentralized model, where local governance gained prominence. While the central authority remained strong under rulers like Chandragupta I and Samudragupta, the empire relied heavily on provincial governors and feudal lords. The Gupta era witnessed an increased role of guilds and local assemblies (sabhas and samitis) in decision-making, contributing to economic prosperity and cultural advancements. Unlike the Mauryans, who maintained a vast standing army and a rigid bureaucratic structure, the Guptas emphasized diplomatic alliances, trade expansion, and a patronage-based system. This paper compares the

governance mechanisms of these two dynasties, analyzing their effectiveness in maintaining stability, promoting economic growth, and influencing later Indian administrative traditions. While the Mauryan administration excelled in central control and welfare policies, the Gupta period fostered a participatory governance model, which allowed for greater regional autonomy. The study also explores how these governance models influenced medieval and modern Indian administrative systems. By employing historical texts, inscriptions, and secondary sources, this research provides insights into the strengths and limitations of both governance models. It argues that the fusion of centralized control (Mauryan) and decentralized administration (Gupta) created a governance legacy that shaped India's political and economic institutions for centuries. Understanding these historical governance frameworks can offer valuable lessons for contemporary policy-making and governance reforms.

ENHANCING STRUCTURAL PERFORMANCE OF CONCRETE BEAMS WITH BAMBOO TEXTILE REINFORCED POLYMER RETROFITTING

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In recent years, the retrofitting of reinforced concrete (RC) structures has become a crucial aspect of structural engineering, driven by the need to enhance durability, load-bearing capacity, and service life. Traditional retrofitting materials, such as carbon and synthetic fiber-reinforced polymers, offer high strength but come with environmental concerns due to their non-biodegradable nature and hazardous production processes. As a sustainable alternative, Bamboo Textile Reinforced Polymer (BTRP) laminates provide a renewable, cost-effective, and eco-friendly solution for strengthening RC beams. This study evaluates the structural performance of RC beams retrofitted with BTRP laminates by analyzing their load-deflection behavior and failure mechanisms. The experimental program consists of five sets of beams, each with three specimens. Initially, a control group of three beams is tested to determine their failure load. The remaining beams are subjected to preloading at 60%, 70%, 80%, and 90% of the control beam's failure load before being retrofitted with BTRP laminates and tested to failure. The results reveal that the beam retrofitted at 60% of its failure load exhibited a 54.27% increase in load-bearing capacity compared to the control beam. Furthermore, numerical simulations were conducted to

validate the experimental findings. The computed ultimate load-carrying capacities closely aligned with the test results, showing a variation of less than 3%. These findings confirm the effectiveness of BTRP laminates as a viable alternative to conventional strengthening techniques, offering a sustainable and structurally efficient solution for retrofitting reinforced concrete beams.

MULTIFACETED APPLICATIONS OF CURCUMA LONGA: A COMPREHENSIVE REVIEW ON ITS MEDICINAL, INDUSTRIAL, AND SUSTAINABLE USES

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Curcuma longa, commonly known as turmeric, is a rhizomatous herbaceous plant widely used in traditional medicine, culinary practices, and various industries. This paper explores the diverse applications of Curcuma longa, highlighting its medicinal, pharmaceutical, cosmetic, and food-related benefits. Turmeric's bioactive compound, curcumin, is recognized for its potent antioxidant, anti-inflammatory, antimicrobial, and anticancer properties, making it a valuable component in modern therapeutic applications. In traditional medicine systems such as Ayurveda, Unani, and Traditional Chinese Medicine (TCM), turmeric has been used for centuries to treat a variety of ailments, including digestive disorders, respiratory conditions, and skin diseases. Recent scientific research has further validated its role in managing chronic diseases such as arthritis, cardiovascular diseases, diabetes, and neurodegenerative disorders like Alzheimer's disease. The pharmaceutical industry has leveraged curcumin’s therapeutic potential to develop supplements and drug formulations aimed at improving human health. Beyond medicine, Curcuma longa is extensively utilized in the food industry as a natural coloring and flavoring agent. Its distinctive yellow pigment, curcumin, is used to enhance the appearance of foods and beverages, while its antimicrobial properties contribute to food preservation. Turmeric is also a key ingredient in cosmetic formulations due to its skin-brightening, anti-aging, and wound-healing properties, making it a preferred choice in skincare and personal care products. Additionally, the agricultural sector benefits from turmeric’s pesticidal and antifungal properties, which aid in sustainable farming practices. Research is also being conducted on its potential applications in nanotechnology, biotechnology, and environmental sustainability, such as wastewater treatment and biodegradable packaging. Despite its numerous benefits, challenges such as poor bioavailability, stability, and standardization in commercial formulations need to be addressed to maximize its potential. Novel approaches like nanoencapsulation, lipid-based carriers,

and synthetic analogs are being explored to enhance its therapeutic efficacy. This paper provides a comprehensive overview of the multifaceted uses of Curcuma longa, emphasizing its importance in health, industry, and sustainable development. Future research should focus on optimizing its applications through advanced scientific innovations and clinical studies to harness its full potential for human well-being.

INTELLIGENT TRANSPORTATION SYSTEMS: A PATHWAY TO SUSTAINABLE AND EFFICIENT PUBLIC TRANSIT

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The integration of Artificial Intelligence (AI) and Intelligent Transportation Systems (ITS) into urban and spatial planning has revolutionized how cities manage resources, infrastructure, and services. This transformation is particularly evident in the development of smart cities, where technology is leveraged to enhance the quality of life, promote sustainability, and optimize urban operations. The integration of Artificial Intelligence (AI) into urban planning and smart city development has revolutionized the way cities address chronic urban challenges, enhance livability, and promote sustainable development. This paper explores the transformative role of AI in urban infrastructure, focusing on intelligent transportation systems (ITS) and their impact on traffic management, resource optimization, and citizen engagement. By leveraging AI-enabled technologies such as real-time traffic monitoring, smart grids, and electronic payment systems, cities can improve service delivery, reduce congestion, and minimize environmental impacts. Case studies from cities like Stockholm, London, and Singapore highlight the successful implementation of ITS, including congestion pricing, real-time traffic advisories, and parking guidance systems. The paper also discusses the importance of policy frameworks and multi-disciplinary approaches to maximize the potential of ITS at a network level. Furthermore, it emphasizes the need for citizen participation and feedback mechanisms to ensure inclusive and efficient urban planning. The findings underscore the strategic value of embedding AI in urban infrastructure, enabling cities to learn from data, optimize operations, and enhance the quality of life for their inhabitants.

INFLUENCE OF MARBLE POWDER AND STONE DUST ON THE STRENGTH CHARACTERISTICS OF M-40 GRADE CONCRETE

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The increasing demand for sustainable construction materials has driven research into the utilization of industrial by-products in concrete production. Marble powder, a significant waste material generated during marble processing, poses environmental disposal challenges. Similarly, stone dust, a by-product of stone crushing, accumulates in large quantities, making its effective utilization crucial. Integrating these waste materials into concrete production can enhance sustainability while potentially improving concrete performance. This study explores the impact of replacing cement with marble powder and fine aggregate with stone dust on the mechanical properties of **M-40** grade concrete. Concrete mixtures were designed following **IS: 10262:2009** guidelines, incorporating marble powder as a partial cement replacement at **10%, 20%,** and **30%**, alongside stone dust replacing fine aggregate at **50%**, **70%**, and **100%**. The study evaluates the compressive, split tensile, and flexural strengths of modified concrete specimens at **7** and **28** days of curing. By comparing the results with conventional concrete, the research aims to determine the optimal mix proportions that maximize strength while promoting the sustainable use of industrial waste materials in construction.

EMPOWERING SPECIALLY ABLED PERSONS: THE IMPACT OF THE DISABILITY ACT 2016 IN THE STUDY OF PASCHIM MEDINIPUR DISTRICT IN WEST BENGAL

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Specially abled people are an essential part of society. For a long time, they have been deprived, neglected, exploited, oppressed, and suppressed from all opportunities for social, economic, and active participation. In developing countries like India, specially-abled people face many daily problems and challenges. The Rights of Persons with Disabilities Act, 2016, has been enacted as an important law to ensure the inclusion and empowerment of persons with disabilities in social and

economic life and equality. This study evaluates the changes in the capacity development, employment, education, healthcare, and overall socio-economic conditions of persons with disabilities in Paschim Medinipur district of West Bengal. We chose this district for the study due to its extensive size, spanning from plains to forests in West Bengal. Here, the gap between villages and cities, access to government services, and people with disabilities in jungle areas face various challenges. The study relied upon qualitative and quantitative research methods, but it has predominantly been qualitative and analytical. The study collected data from both primary and secondary sources, utilizing the interview schedule as a data collection tool. The main objective of this study is to evaluate the implementation process of the Persons with Disabilities Act, 2016, especially in Paschim Medinipur district, and review the current status of education, health, and employment of persons with disabilities. This study has found that although this law has been enacted to protect and empower the rights of persons with disabilities, there are several limitations in its implementation due to administrative weaknesses, prejudices, and lack of infrastructure.

ADVANCED ENCRYPTION ALGORITHMS FOR SECURE DATA TRANSMISSION USING GRAPH-BASED STRUCTURES

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In today's interconnected world, safeguarding sensitive information through secure communication is more important than ever. Traditional cryptographic techniques often face challenges in defending against modern, sophisticated attacks. This paper proposes innovative encryption algorithms that combine the power of **corona graphs, bipartitegraphs,** and **complete graphs,** along with algebraic properties, to enhance data security. The **corona graph**, formed by attaching copies of one graph to the vertices of another, adds a layer of complexity, while **bipartite graphs**offer a structured division of vertices into two sets, making the system more resistant to unauthorized access. The use of **complete graphs**further strengthens the system by ensuring that every pair of vertices is connected, contributing to an intricate and secure encryption framework. By integrating these graph structures, the proposed encryption methods provide a robust, multi-layered approach that offers enhanced protection against both classical and contemporary cryptographic attacks. This novel

combination of graph-theoretical concepts paves the way for more secure communication, ensuring the confidentiality and integrity of transmitted data.

ENVIRONMENTAL TOXINS AND INFERTILITY: IMPACT, MECHANISMS, AND PREVENTIVE STRATEGIES

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Environmental toxins have emerged as a significant factor contributing to rising infertility rates worldwide. This paper explores the complex relationship between environmental pollutants and reproductive health, emphasizing the adverse effects of endocrine-disrupting chemicals (EDCs), heavy metals, pesticides, and industrial pollutants on fertility in both males and females. Exposure to environmental toxins disrupts hormonal balance, impairs gametogenesis, and increases oxidative stress, leading to reduced fertility. In males, pollutants such as phthalates, bisphenol A (BPA), and heavy metals like lead and cadmium have been linked to decreased sperm count, poor motility, and DNA fragmentation. In females, these toxins interfere with ovarian function, disrupt menstrual cycles, and reduce oocyte quality, ultimately leading to infertility, miscarriages, and complications in pregnancy. Additionally, persistent organic pollutants (POPs) and air pollutants like polycyclic aromatic hydrocarbons (PAHs) contribute to delayed conception and adverse pregnancy outcomes. This review highlights recent epidemiological and experimental studies that establish a direct correlation between environmental exposure and infertility. It also discusses the role of oxidative stress and inflammation as key mechanisms by which toxins impair reproductive functions. The impact of occupational exposure, dietary intake, and lifestyle choices is examined to provide a comprehensive understanding of risk factors. Preventive measures such as lifestyle modifications, policy interventions, and regulatory frameworks to limit human exposure to harmful chemicals are crucial in addressing this global health challenge. Public awareness, stricter environmental regulations, and advancements in detoxification strategies can mitigate the reproductive health risks posed by environmental toxins. This study underscores the urgent need for multidisciplinary research to develop strategies for early detection, prevention, and management of infertility linked to environmental toxins. Future research should focus on biomonitoring, toxicological assessments, and the development of safer alternatives to hazardous chemicals. Addressing these concerns is imperative for safeguarding reproductive health and ensuring sustainable population growth.

DEVELOPMENT OF HIGH EARLY-STRENGTH CONCRETE FOR ACCELERATED BRIDGE CONSTRUCTION CLOSURE POUR CONNECTIONS

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Accelerated Bridge Construction (ABC) has gained popularity for both bridge deck replacements and new bridge projects due to its ability to reduce on-site construction time, enhance roadway safety, and minimize traffic disruptions. A key component of ABC is the use of prefabricated bridge elements, which are fabricated offsite and assembled on-site using closure pours. These pours require high-performance materials, such as ultra-high performance concrete (UHPC) or rapid-setting concrete, to ensure rapid strength gain and load transfer between structural components. However, many of these materials contain proprietary components, making them costly and difficult to specify in federally funded projects. Given these challenges, there is a growing need for non-proprietary concrete mixtures that provide high-early strength, rapid set times, and long-term durability, particularly in regions like New England, where freeze-thaw cycles, deicing chemicals, and temperature fluctuations pose durability concerns. This study focuses on developing and validating non-proprietary concrete mixtures that achieve a compressive strength of 4000 psi within 12 hours while maintaining workability and durability. Key challenges addressed include mitigating shrinkage cracking, optimizing set times, and improving resistance to environmental stressors. Strategies such as using shrinkage-reducing admixtures and incorporating fly ash were evaluated to enhance performance. A combination of laboratory testing, literature review, and a survey of New England DOTs was conducted to assess performance criteria for ABC closure pours. The research ultimately provides a specification for a cost-effective, durable, and high-early strength concrete mixture, ensuring broader adoption of ABC techniques in bridge construction.

ROLE OF TRANSPORTATION IN REGIONAL DEVELOPMENT: A GEOGRAPHICAL ANALYSIS

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Transportation plays a crucial role in regional development by influencing economic growth, social integration, and spatial organization. This study examines the impact of transportation infrastructure on regional development, emphasizing its role in enhancing accessibility, economic activities, and overall quality of life. The research employs a geographical analysis approach to understand the spatial distribution of transport networks and their correlation with regional growth patterns. Efficient transportation systems facilitate trade, industry, and employment opportunities by reducing travel time and costs. Well-connected regions attract investments, promote industrialization, and enhance the mobility of goods and services. Conversely, inadequate transportation infrastructure leads to regional disparities, hindering socio-economic progress and limiting access to essential services like education and healthcare. This paper explores case studies that highlight how transportation initiatives, such as road networks, railways, and public transit systems, have contributed to regional development in different parts of the world. The study also delves into the environmental and sustainability aspects of transportation, emphasizing the need for eco-friendly and energy-efficient transport solutions. Modern trends, including smart transportation and sustainable urban mobility, are analyzed to understand their potential in addressing challenges like congestion and pollution. Additionally, the paper discusses the role of government policies, public-private partnerships, and technological advancements in shaping regional transportation infrastructure. A comprehensive geographical analysis using GIS mapping and statistical techniques helps identify patterns of development influenced by transportation networks. The findings indicate that strategic transport planning can bridge the rural-urban divide, promote balanced regional growth, and enhance connectivity between peripheral and core regions. In conclusion, transportation is a key driver of regional development, significantly impacting economic prosperity, social cohesion, and environmental sustainability. Policymakers must prioritize integrated transport planning to achieve inclusive and sustainable regional development. Future research should focus on emerging technologies and innovative transport solutions that can further enhance regional connectivity and development.

MEDICINAL PLANTS: THEIR IMPORTANCE IN HEALTHCARE AND SUSTAINABLE MEDICINE

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Medicinal plants have been an integral part of human healthcare systems for centuries, offering natural remedies for various ailments. With the advancement of modern medicine, traditional knowledge of medicinal plants has gained scientific validation, emphasizing their pharmacological significance. This paper explores the importance of medicinal plants, their bioactive compounds, and their role in disease prevention and treatment. Medicinal plants contain a wide range of phytochemicals such as alkaloids, flavonoids, tannins, and essential oils, which exhibit antimicrobial, anti-inflammatory, antioxidant, and anticancer properties. These bioactive compounds have been extensively studied for their therapeutic potential, leading to the development of numerous modern drugs. For example, aspirin was derived from Salix alba (willow bark), while the anti-malarial drug quinine originated from Cinchona species. Such discoveries highlight the essential link between traditional herbal medicine and modern pharmacology. Apart from their medicinal properties, these plants contribute significantly to biodiversity, ecological balance, and sustainable healthcare. Many developing countries still rely on medicinal plants as primary healthcare solutions due to their affordability and accessibility. Ayurveda, Traditional Chinese Medicine (TCM), and Unani medicine continue to use medicinal plants as the foundation for holistic healing approaches. Despite their immense benefits, medicinal plants face challenges such as habitat destruction, overharvesting, and loss of traditional knowledge. Conservation strategies, including sustainable harvesting, cultivation practices, and biotechnological interventions, are crucial for preserving these valuable natural resources. Moreover, scientific validation through phytochemical analysis and clinical trials is essential to ensure the safety and efficacy of herbal medicines. This paper underscores the importance of medicinal plants in healthcare, their role in drug discovery, and the need for conservation efforts. With growing interest in natural and plant-based therapies, integrating traditional medicinal knowledge with modern scientific research can lead to new advancements in medicine. By promoting awareness and sustainable practices, medicinal plants can continue to play a vital role in human health and well-being.

A STUDY OF RADIATION PHYSICS IN ENVIRONMENTAL MONITORING AND PROTECTION

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Radiation physics plays a crucial role in environmental monitoring and protection by enabling the detection, measurement, and mitigation of natural and anthropogenic radiation sources. This study explores the fundamental principles of radiation physics, its impact on the environment, and its applications in monitoring and safeguarding ecological and human health. Radiation, both ionizing and non-ionizing, originates from various natural sources, such as cosmic rays and terrestrial radioisotopes, as well as human activities, including nuclear power plants, medical imaging, and industrial processes. Understanding the interactions of radiation with matter is essential for assessing its effects on ecosystems and public health. Advanced radiation detection technologies, such as Geiger-Müller counters, scintillation detectors, and dosimeters, allow precise measurement and tracking of radiation levels in air, water, and soil. Environmental monitoring programs utilize radiation physics to evaluate radioactive contamination in natural resources. The study of radon gas emissions, radioactive waste disposal, and nuclear accidents has led to the development of safety protocols and remediation techniques. Furthermore, remote sensing and satellite-based radiometric measurements have enhanced our ability to track radiation exposure on a global scale. Radiation protection strategies focus on minimizing exposure through shielding, time regulation, and distance control, as outlined by international guidelines from the International Atomic Energy Agency (IAEA) and the Environmental Protection Agency (EPA). Additionally, advancements in radiation dosimetry and bio-monitoring have improved risk assessment models for human and ecological health. Despite technological advancements, challenges remain in managing long-term radioactive waste, mitigating radiation leaks, and ensuring compliance with safety regulations. Future research in radiation physics aims to enhance real-time monitoring techniques, improve radiation shielding materials, and develop sustainable nuclear energy solutions with minimal environmental impact. In conclusion, radiation physics is a vital discipline in environmental science, contributing to the effective monitoring and protection of ecosystems and human populations from radiation hazards. Ongoing advancements in detection methods, risk assessment, and safety protocols will further strengthen our ability to manage radiation-related environmental challenges in the future.

THE IMPACT OF EWOM ON CONSUMER BUYING BEHAVIOR IN E-COMMERCE

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With the rise of digital platforms, **Electronic Word of Mouth (eWOM)** has emerged as a critical factor influencing consumer purchasing decisions in **e-commerce**. Unlike traditional word-of-mouth, eWOM spreads rapidly through online reviews, ratings, testimonials, and social media discussions, significantly shaping consumer perceptions and trust. This study examines the impact of eWOM on consumer buying behavior in e-commerce, particularly in the Indian market, where platforms like **Amazon, Flipkart, and Meesho** dominate online retail. The research explores various dimensions of eWOM, including **review credibility, volume, valence (positive/negative), and source trustworthiness**, to understand how they influence **purchase intentions and brand loyalty**. A mixed-method approach, combining **quantitative surveys and qualitative content analysis**, has been employed to assess consumer responses to online reviews and recommendations. The study also investigates the role of **social media influencers and YouTube product reviews** in driving online purchases, particularly in categories like **electronics, fashion, and beauty products**. Findings indicate that **positive eWOM significantly enhances consumer confidence**, leading to higher conversion rates in e-commerce. Consumers tend to rely on detailed product reviews, star ratings, and user-generated content before making purchase decisions. However, **negative eWOM has a stronger impact than positive feedback**, often discouraging potential buyers. The presence of **fake or paid reviews** also poses a challenge, reducing consumer trust in online platforms. Furthermore, the research highlights the increasing role of **Artificial Intelligence (AI)** in moderating and filtering eWOM to maintain credibility. The study concludes that businesses must **strategically manage eWOM** by encouraging genuine customer feedback, responding to negative reviews professionally, and leveraging influencer marketing effectively. E-commerce platforms should focus on **transparency and review authentication mechanisms** to build consumer trust. These insights are valuable for marketers, online retailers, and policymakers aiming to enhance consumer trust and engagement in the rapidly growing e-commerce sector.

DATA ANALYTICS BY PYTHON AI, TO UNDERSTAND DEVIATION OF MINIMUM TEMPERATURE DURING WINTER

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This paper is based on data analysis by Python programming language on Google collaborator platform, supported by the AI code, model used as neural network, to understand the deviation of minimum temperature for the period November to February in comparison with recoded normal .The source of data is online data collection platform 'INDIA METEOROLOGICAL DEPARTMENT ,PUNE' and the online site 'OGIMET' .The surface data for Alipore (42807) and the recorded normal temperature ,as available there has been collected in csv file format, then uploading the csv file in Google collaborator platform ,executed analysis by Python neural network model technique ,to understand the predicted output ,i.e. pattern of deviation of minimum temperature ,based on analysis of big data, with minimum temperature data from 1969 to 2024 . In this case the input column used is the column created with data of difference between minimum temperature and recorded normal for that month. The mod value of temperature difference for the four months, November to February filtered from this big data set has been used as filtered and scaled data , subjected to analyse to understand the future trend of this deviation .Model fit has been used with train-test split in 80-20% ratio. The artificial neural network model actually resembles the structure of human brain ,which can perform intelligent tasks similar to human brain by the process of learning by the machine .Like human brain a similar network is there with mapping between input and output ,information propagated through different layers ,using back propagation technique to learn the model to get best output with minimum loss .This technique resembles to the networking of human brain and neuron ,where information is propagated through synaptic joints to react accordingly. In this paper prediction as well as analysis has been made with the application of artificial neural network with used model as LSTM supported by activation function and optimiser to learn the model for best fit output. The loss value of the model has also been verified to understand the success rate of the model.

MORPHOLOGICAL AND PHYSIOLOGICAL ADAPTATIONS OF PLANTS IN ARID REGIONS

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Arid regions are characterized by extreme temperatures, limited water availability, and high evapotranspiration rates, posing significant challenges to plant survival. To thrive in such harsh environments, plants have developed a range of morphological and physiological adaptations that enable them to conserve water, withstand high temperatures, and optimize nutrient uptake. This paper explores the diverse strategies employed by plants in arid regions, highlighting key adaptations at both structural and functional levels. Morphologically, plants in arid environments exhibit modifications such as reduced leaf surface area, thick cuticles, deep and extensive root systems, and the presence of spines or trichomes to minimize water loss. Many species, including cacti and succulents, have evolved specialized water-storage tissues that allow them to endure prolonged dry periods. Leaf rolling, leaf shedding, and xerophytic leaf structures further contribute to reducing transpiration. Physiologically, arid-region plants display adaptive mechanisms such as crassulacean acid metabolism (CAM) and C4 photosynthesis, which enhance water-use efficiency. CAM plants, for instance, open their stomata at night to minimize water loss while maximizing carbon dioxide uptake. Some species exhibit osmotic adjustments by accumulating solutes like proline and glycine betaine to maintain cell turgor under drought conditions. Other physiological responses include changes in stomatal conductance, enhanced antioxidant activity to mitigate oxidative stress, and the production of secondary metabolites that offer protection against herbivory and environmental stressors. These morphological and physiological strategies collectively enable plants to sustain growth and reproduction in arid ecosystems. Understanding these adaptations is crucial for ecological conservation, climate change resilience, and agricultural advancements, particularly in developing drought-resistant crop varieties. Further research on the genetic and biochemical mechanisms underlying these adaptations can provide valuable insights for improving plant survival in water-limited environments. This study highlights the remarkable resilience of arid-region plants and underscores the importance of adaptive strategies in ensuring their survival amid increasingly unpredictable climatic conditions. By integrating ecological, physiological, and genetic perspectives, this paper contributes to a deeper understanding of plant responses to extreme environmental challenges.

A STUDY ON ENHANCING CONSUMER SATISFACTION AND CREATING A WOW FACTOR THROUGH TECHNOLOGY OR INNOVATION OF HUMAN TOUCH IN THE CONTEXT OF INDIAN HOSPITALITY INDUSTRY

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In order to sustain a company's competitive advantage, providing innovative products or services is very much a necessity. Like many other financial services, the hospitality industry is facing a lot of challenges in terms of facing a rapidly changing market, economic uncertainties, new technologies, extensive competition and demanding customers. Customer service and satisfaction is one of the integral parts of the hospitality industry. A lot of research has taken place in enhancement and innovation in technology in the hospitality industry but little has taken in innovating human touch. However, many researchers believe that human touch is a key factor in creating a great consumer delight. The Indian hospitality industry depends a great deal on the 'human touch', which is accompanied by personalised services. The human touch, care and empathy that is very much associated with this industry cannot be replaced. It is also to be remembered that people travel in order to have human interaction. Anticipatory needs are only possible through human experience and hence can help in creating repeat business in the industry and creating a wow factor. The research study aims at exploring both the innovations and provides valuable information on the topic.

MULTIFACETED APPLICATIONS OF CAROM SEEDS (TRACHYSPERMUM AMMI): A REVIEW ON MEDICINAL, CULINARY, AND INDUSTRIAL USES

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Carom seeds (Trachyspermum ammi), commonly known as ajwain, have been extensively used in traditional medicine, culinary applications, and industrial sectors. This paper explores the diverse uses of carom seeds, highlighting their medicinal, nutritional, and commercial significance. Carom seeds are rich in bioactive compounds such as thymol, terpenes, and flavonoids, which exhibit antimicrobial, antifungal, antioxidant, and anti-inflammatory properties. These properties make carom seeds an essential ingredient in Ayurveda and other traditional healing systems for treating digestive disorders, respiratory ailments, and infections. In the food industry, carom seeds are widely used as a spice to enhance flavor and aid digestion. They are a common ingredient in Indian, Middle Eastern, and Mediterranean cuisines,

often incorporated into bread, pickles, and savory dishes. Their carminative nature helps alleviate indigestion, bloating, and acidity, making them a natural remedy for gastrointestinal discomfort. Beyond medicinal and culinary applications, carom seeds have growing relevance in pharmaceutical and cosmetic industries. Their essential oil, primarily composed of thymol, is utilized in antiseptic formulations, mouthwashes, and skincare products due to its antimicrobial properties. The seed extracts are also being researched for their potential role in managing diabetes, hypertension, and cholesterol levels. Moreover, carom seeds find applications in agriculture as a natural pesticide and in animal husbandry for improving livestock health. The bioactive compounds in carom seeds contribute to their use in organic farming as eco-friendly pest control agents. Additionally, their potential as a functional food ingredient is gaining attention, with ongoing research exploring their nutraceutical benefits. Despite their extensive uses, further scientific studies are needed to validate the therapeutic claims and optimize their applications in modern medicine and industries. This paper aims to provide a comprehensive review of the uses of carom seeds, emphasizing their importance in various sectors and highlighting future research directions for their enhanced utilization.

RECENT ADVANCES IN QUANTUM COMPUTING: CHALLENGES AND FUTURE PROSPECTS

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Quantum computing has emerged as one of the most promising frontiers in modern physics and computer science, with the potential to revolutionize fields ranging from cryptography to material science and artificial intelligence. Unlike classical computing, which relies on binary bits (0 and 1), quantum computing leverages the principles of superposition, entanglement, and quantum parallelism to perform complex calculations exponentially faster than traditional computers. Over the past decade, significant advancements have been made in quantum hardware, error correction, and quantum algorithms, bringing us closer to practical quantum advantage. This paper explores the recent breakthroughs in quantum computing, including developments in superconducting qubits, trapped ions, and photonic quantum processors. We discuss key milestones such as Google's demonstration of quantum supremacy and IBM's advancements in quantum circuit optimization. Furthermore, we highlight the role of hybrid quantum-classical algorithms in solving real-world problems, including drug discovery, optimization, and financial modeling.

Despite rapid progress, quantum computing faces significant challenges that hinder large-scale implementation. Decoherence, noise, and error rates in quantum systems pose fundamental limitations, necessitating the development of robust quantum error correction techniques. Additionally, scalability remains a critical issue, as increasing the number of qubits without compromising coherence and connectivity is a formidable engineering challenge. The need for a stable quantum software ecosystem and improvements in quantum hardware fabrication also present ongoing hurdles. Looking ahead, the future of quantum computing depends on overcoming these obstacles through interdisciplinary collaboration in physics, computer science, and engineering. The integration of artificial intelligence in quantum error correction, the potential of topological qubits, and the exploration of new quantum architectures could pave the way for fault-tolerant quantum computing. Governments and tech giants are investing heavily in quantum research, indicating a promising trajectory for the field. In conclusion, while quantum computing is still in its early stages, recent advancements demonstrate its potential to revolutionize computation. Addressing current limitations will be crucial in realizing its full impact, making quantum computing a transformative technology of the 21st century.

MAHATMA GANDHI'S PHILOSOPHY OF NONVIOLENCE AND ITS GLOBAL INFLUENCE

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Mahatma Gandhi's philosophy of nonviolence (ahimsa) remains one of the most influential ideologies in modern history, shaping political movements, social justice initiatives, and peace-building efforts worldwide. Rooted in ancient Indian traditions, particularly Jainism and Hinduism, Gandhi redefined ahimsa as an active force for resistance against oppression, emphasizing truth (satyagraha), self-discipline, and moral courage. His application of nonviolent resistance during India's struggle for independence from British rule demonstrated the power of peaceful civil disobedience, inspiring global leaders and movements. This paper explores the philosophical foundations of Gandhi's nonviolence, analyzing its ethical, spiritual, and political dimensions. It examines how satyagraha became a powerful tool for social and political transformation, influencing figures such as Martin Luther King Jr., Nelson Mandela, and the Dalai Lama. From the Civil Rights Movement in the United States to the anti-apartheid struggle in South Africa, Gandhi's principles have shaped strategies for nonviolent protest and conflict resolution. The study also highlights the continued

relevance of his philosophy in contemporary global issues, including human rights advocacy, environmental activism, and international peace efforts. Despite its success, Gandhi's philosophy has faced criticism, particularly regarding its practical limitations in the face of extreme violence and totalitarian regimes. This paper critically evaluates these arguments while reaffirming the significance of nonviolence as a sustainable approach to resolving conflicts in an increasingly polarized world. Through an interdisciplinary approach, this research contributes to the ongoing discourse on nonviolence, demonstrating that Gandhi's teachings remain a guiding light for ethical leadership and peaceful resistance in the 21st century. By understanding and applying his principles, societies can foster harmony, justice, and lasting global peace.

TARGETING THE 5-HT$_{2C}$ RECEPTOR IN BIOLOGICAL SYSTEMS AND THE ONGOING PROGRESS IN DEVELOPING 5-HT$_{2C}$ RECEPTOR LIGANDS

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The serotonin (5-HT) 5-HT2C receptor (5-HT2CR) is recognized as a key mediator in disease-related pathways and behaviour due to its effects in the Central Nervous System (CNS). As a class a G-Protein Coupled Receptor (GPCR), research on 5-HT2CR has largely focused on activating it with synthetic ligands. Agonists are being explored for treating conditions like obesity, substance use disorders, and impulse control disorders, while antagonists may offer potential for managing anxiety, depression, and schizophrenia. The most notable agonist discovered so far is lorcaserin, an FDA-approved anti-obesity drug. More recently, research into alternative methods to enhance receptor function has led to the discovery of Positive Allosteric Modulators (PAMs) for 5-HT2CR, with several series of molecules now identified. This book chapter discusses the biological significance of 5-HT2CR signaling and function, as well as the current status of 5-HT2CR agonists and PAMs.

IMPACT OF CLIMATE CHANGE ON VECTOR-BORNE DISEASES

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Climate change has emerged as a significant global concern, influencing various environmental and public health aspects. Among its many consequences, the rise in vector-borne diseases (VBDs) is particularly alarming. This paper explores the impact of climate change on the prevalence, distribution, and severity of vector-borne diseases, focusing on malaria, dengue, chikungunya, Lyme disease, and Zika virus. Changes in temperature, humidity, and precipitation patterns directly affect the life cycle, reproduction, and geographical spread of disease-carrying vectors such as mosquitoes, ticks, and sandflies. Warmer temperatures accelerate the development of pathogens within vectors, leading to increased transmission rates. Altered precipitation patterns create new breeding sites for mosquitoes, while droughts force vectors and hosts to migrate, expanding the range of VBDs into previously unaffected regions. Additionally, extreme weather events, such as floods and hurricanes, contribute to the outbreak and resurgence of these diseases by disrupting ecosystems and human settlements. The study also highlights the socio-economic implications of climate-driven vector-borne diseases. Developing countries with inadequate healthcare infrastructure are disproportionately affected, facing higher mortality rates and economic burdens. Climate change-induced shifts in disease patterns necessitate updated public health policies, enhanced surveillance systems, and integrated vector management strategies. Furthermore, interdisciplinary collaboration between climatologists, epidemiologists, and policymakers is essential to mitigate the risks associated with VBDs in a changing climate. This paper emphasizes the urgent need for proactive measures, including climate adaptation strategies, improved forecasting models, and community-based interventions. Strengthening early warning systems, investing in vaccine development, and promoting public awareness can help minimize the health impacts of vector-borne diseases. As climate change continues to intensify, understanding its relationship with disease transmission is critical for global health security. This study contributes to the ongoing discourse on climate change and public health, advocating for sustainable and adaptive solutions to combat vector-borne diseases in vulnerable populations.

IMPACT OF INFLUENCER MARKETING ON CONSUMER BEHAVIOR TOWARDS MENSTRUAL CUPS

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Menstruation is considered a natural biological process experienced by females of reproductive age.Tampons and Disposable sanitary products are popular choices among menstruators and are among the top 10 targeted single-use plastic items, but they contribute significantly to waste generation as they are often flushed down in toilets, or disposed of as solid waste.Over time, they can break down into smaller fragments, eventually becoming secondary microplastics (plastic particles less than 5 mm in size) that pose serious environmental risks and health concerns.Menstrual cup isa type of reusable menstrual product that serves as a highly beneficial alternative to single-use menstrual products, offering significant health andecological benefits.The emergence of social media platforms has enabled brands to promote and educate consumers about the usage and benefits of menstrual cups. Influencer marketing is one such technique, where influencers consistently communicate, share their opinions on various topics, provide genuine product reviews, and influence consumers' purchase decisions. So, this study aims atunderlying impact of influencer marketing on consumer behavior towards Menstrual cups.This research will use Exploratory Factor Analysis (EFA) to examine the factors influencing consumer behaviour towards Menstrual cups in response to social media influencers. Data will be collected from 160 respondentsin Jaipur, Rajasthan, using a structured questionnaire. The survey will access respondents' perception of social media influencers' attractiveness, credibility, expertise, and trustworthiness, as well as their engagement, behavior, purchase intention, and awareness related to menstrual cups. Descriptive analysis methods and Cronbach's alpha will be used to summarize and assess the data.The findings will be drawn according to the study.

FROM IGNORANCE TO OMNISCIENCE: KEVALAJNANA AS THE KEY TO LIBERATION IN JAIN PHILOSOPHY

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Jain philosophy presents Kevalajnana, or absolute knowledge, as the ultimate state of spiritual awareness, marking the soul’s transition from ignorance to omniscience. This state represents perfect and complete knowledge, free from doubt,

error, or limitation. Attaining Kevalajnana is not only a cognitive achievement but also a transformative spiritual realization that leads to liberation (*moksha*). According to Jain metaphysics, the soul is inherently pure, possessing infinite knowledge, perception, energy, and bliss. However, karmic particles—accumulated through actions rooted in attachment, aversion, and ignorance—obscure these qualities. The journey from ignorance to Kevalajnana involves the gradual removal of these karmic layers through disciplined spiritual practice. Key practices include right faith (samyak darshana), right knowledge (samyak jnana), and right conduct (samyak charitra)—collectively known as the Three Jewels of Jainism. Central to this path are the five major vows: non-violence (ahimsa), truthfulness (satya), non-stealing (asteya), celibacy (brahmacharya), and non-possessiveness (aparigraha). These ethical principles purify the soul, weakening karmic bonds and fostering inner detachment. Meditation, self-discipline, and mindfulness further accelerate this purification process, ultimately enabling the soul to attain Kevalajnana. The concept of Kevalajnana also carries profound philosophical implications. By illustrating the transition from fragmented, subjective knowledge to comprehensive, objective understanding, Jain thought offers insights into the nature of truth and the limits of perception. This framework encourages seekers to cultivate intellectual humility, holistic thinking, and self-awareness as essential tools for overcoming ignorance. In conclusion, Kevalajnana stands as the pinnacle of spiritual achievement in Jain philosophy. As a state of perfect awareness achieved through moral conduct and self-purification, it symbolizes the triumph of wisdom over ignorance and the ultimate path to liberation.

ARUN KOLATKAR'S *AJAMIL AND THE TIGERS:* AN ECOCRITICAL APPROACH

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The poem *Ajamil and the Tigers* by Arun Kolatkar is considered a political satire, as indicated in the Woven Words, an English literature textbook for Class XI, published by the National Council of Educational Research and Training (NCERT). However, this study re-examines the poem from an ecocritical perspective, manifesting its deep ecological and environmental themes. By using a qualitative and conceptual research methodology, the study makes a textual analysis of the poem, revealing how Ajamil's actions are not driven by political cunningness but are guided by an inherent understanding of ecological harmony. Ajamil, a shepherd, does not represent the modern corrupt politicians, nor do the sheep represent the people of weaker sections. After the re-analysis, Ajamil instead emerges as a wise shepherd

who understands the interdependence of species in an ecosystem. His decision to release the tigers and offer them food, rather than killing them all, points out his knowledge of maintaining ecological balance. The study correlates his actions with real-world ecological principles, including the role of predators in controlling herbivore populations, preventing overgrazing, and sustaining biodiversity. Comparisons are drawn between Ajamil and real-life shepherds, particularly those in Rajasthan's Jawai-Bera region, who coexist with leopards without resorting to exterminating them. The study argues that English literature textbooks, such as those prescribed by the NCERT, have the potential to promote environmental awareness among students. The National Policy on Education (NPE) 1986, the National Curriculum Framework (NCF) 2005, and the National Education Policy (NEP) 2020 gave great emphasis to the importance of environmental education. And so, this paper recommends that the NCERT revise its textbook exercise of this chapter to reflect the poem's ecological aspects rather than limiting its interpretation to political satire. By doing so, *Ajamil and the Tigers* can contribute meaningfully to environmental education and reinforce the need for ecological balance and human responsibility towards nature. This research thus reclassifies the poem as an ecology-based literary work, opening up new possibilities for interdisciplinary studies at the intersection of literature, ecology, and education.

BOUNDS ON THE SECOND HANKELDETERMINANT AND TOEPLITZDETERMINANTS OF LOGARITHMICCOEFFICIENTS FOR A CLASS OF ANALYTICFUNCTIONS

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In this paper, we establish sharp initial bounds for the second Hankel determinant and the second Toeplitz determinant of logarithmic coefficients for the class R_car, which consists of functions f that satisfy a specific subordination relationship with a function in the open unit disk D.

GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR SUSTAINABLE PLANNING: INTEGRATING SPATIAL INTELLIGENCE FOR ENVIRONMENTAL AND URBAN DEVELOPMENT

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Geographic Information Systems (GIS) have emerged as a powerful tool for sustainable planning, enabling data-driven decision-making in urban development, environmental conservation, and resource management. This paper explores the role of GIS in sustainable planning by integrating spatial data analysis, remote sensing, and mapping techniques to address contemporary challenges such as climate change, urbanization, and natural resource depletion. GIS facilitates spatial analysis by providing accurate geospatial data, allowing planners to assess land use patterns, environmental risks, and socio-economic trends. By integrating real-time data and predictive modeling, GIS enhances the efficiency of sustainable planning processes. It helps policymakers and urban planners design eco-friendly infrastructure, optimize transportation networks, and ensure the equitable distribution of resources. Furthermore, GIS supports disaster management by identifying vulnerable areas, improving emergency response strategies, and mitigating environmental hazards. The application of GIS in environmental sustainability is particularly significant, as it enables monitoring of deforestation, water resource management, and biodiversity conservation. Through remote sensing technologies, GIS aids in tracking climate change impacts, predicting extreme weather events, and formulating adaptation strategies. Additionally, it promotes participatory planning by involving communities and stakeholders in decision-making processes through interactive mapping and data visualization tools. This paper highlights various case studies demonstrating successful GIS implementation in sustainable planning across different sectors. It also discusses the challenges associated with GIS adoption, such as data accuracy, technical expertise, and financial constraints. Addressing these challenges requires investments in GIS education, infrastructure, and policy frameworks to maximize its potential for sustainable development. In conclusion, GIS serves as an indispensable tool for achieving sustainability by integrating spatial intelligence into planning processes. Its ability to analyze complex spatial data, support evidence-based decision-making, and foster resilience against environmental challenges makes it crucial for future development strategies. The study underscores the need for further research and innovation in GIS technologies to enhance their applicability in sustainable planning, ensuring a balanced approach to economic growth, environmental protection, and social well-being.

DEVELOPMENT OF BIODEGRADABLE POLYMERS FOR SUSTAINABLE PACKAGING SOLUTIONS

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The increasing global demand for sustainable and eco-friendly alternatives to conventional plastic packaging has led to significant advancements in biodegradable polymers. Traditional petroleum-based plastics contribute to environmental pollution and waste accumulation due to their non-degradable nature. In contrast, biodegradable polymers offer a promising solution by decomposing naturally under microbial action, reducing their environmental footprint. This study explores the development, properties, and applications of biodegradable polymers for sustainable packaging solutions. Biodegradable polymers, such as polylactic acid (PLA), polyhydroxyalkanoates (PHA), polybutylene succinate (PBS), and starch-based polymers, have gained attention due to their renewability, biocompatibility, and ability to degrade in natural environments. These polymers exhibit unique physicochemical properties, including tensile strength, barrier properties, and thermal stability, which are crucial for packaging applications. However, challenges such as cost-effectiveness, production scalability, mechanical properties, and degradation conditions must be addressed to enhance their commercial viability. This paper provides a comprehensive review of recent advancements in biodegradable polymer synthesis, processing technologies, and their potential impact on sustainable packaging. The study discusses various polymer blends and composite materials designed to enhance biodegradability, mechanical strength, and moisture resistance. Additionally, life cycle assessment (LCA) studies are examined to evaluate the environmental benefits of biodegradable polymers compared to conventional plastics. Furthermore, the role of government regulations, consumer awareness, and industrial initiatives in promoting biodegradable packaging solutions is analyzed. The transition to biodegradable polymers aligns with global sustainability goals, including reducing carbon footprints and minimizing plastic waste pollution. Despite challenges, ongoing research and technological innovations in polymer science, biorefinery approaches, and nanotechnology are driving the development of cost-effective and high-performance biodegradable packaging materials. In conclusion, biodegradable polymers represent a transformative solution for achieving sustainable packaging while addressing the environmental concerns associated with traditional plastics. This paper highlights the potential of biodegradable polymers in revolutionizing the packaging industry and underscores the need for continued research and

collaboration between academia, industry, and policymakers to accelerate their adoption.

EFFICIENT PHOTOVOLTAICS BY EMPLOYING PLASMONIC AND PHOTONIC NANOSTRUCTURES

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To meet the increasing energy demands, humans have extensively relied on conventional non-renewable energy sources such as oil, natural gas, and coal. However, these resources are limited and contribute to environmental pollution and global climate change. Solar photovoltaic energy offers a potential solution, as the amount of solar power reaching the Earth exceeds its energy needs. The primary challenges with photovoltaics are the high cost and limited efficiency of the modules. Using a thin absorbing layer in solar cells can reduce costs by requiring less material for their production. However, reducing the thickness of the semiconductor layer also reduces light absorption, which decreases the efficiency of the solar cells. To address this issue, various light trapping techniques have been developed. In this study, we explore the use of plasmonic and photonic nanostructures in solar cells, which could allow for thinner absorbing layers without sacrificing light absorption. This approach could lead to the creation of cost-effective, high-efficiency solar cells. Weinvestigate the photovoltaic performance of solar cells with different plasmonic and photonic nanostructures.

SUSTAINABLECONCRETEPRODUCTIONUSING COPPER SLAG AND RICE HUSK ASH AS ECO- FRIENDLY ALTERNATIVES

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Concrete is a vital construction material widely used across the globe, but its sustainability is under increasing scrutiny due to the extensive use of natural aggregates and cement, both of which have environmental and resource-related challenges. In India, the shortage of natural aggregates is exacerbated by restrictions on riverbed sand extraction to prevent ecological damage. Additionally, cement

production contributes significantly to carbon dioxide emissions, raising concerns about the long-term sustainability of concrete. To mitigate these issues, this study explores the use of industrial and agro-waste materials as sustainable alternatives in concreteproduction. Specifically, it focusesoncopperslag, anindustrialby-product fromcopper refining, and rice husk ash (RHA), an agro-waste, as potential substitutes for conventional materials in concrete mixes. Copper slag, produced in large quantities, is often discarded, causing environmental pollution. However, it can be utilized as are placement forfine aggregates in concrete, offering benefits such as increased strength and durability. Rice husk, a by-product of rice production, istypicallyburned for fuel, but whenprocessed into rice huskash, it becomes a highly reactive pozzolanic material that can replace a portion of cement. This study aims to evaluate the physical and chemical properties of copper slag and RHA, investigate their effects on the performance of concrete in terms of strength and durability, and compare the results to conventional concrete. Ultimately, the goal is to provide recommendations for using these waste materials to enhance the sustainability of concrete production.

INCORPORATINGWASTEPOLYETHYLENEINASPHALTPAVEMENT MIXTURES: A SUSTAINABLE APPROACH

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Bituminous mixtures are extensively used in flexible pavement construction, consisting of asphalt or bitumen as a binder combined with mineral aggregates, which are mixed, laid in layers, and compacted. While well-designed bituminous pavements generally perform satisfactorily, they often face performance issues due to increasing traffic loads, temperature variations, and moisture-induced conditions. To enhance durability, extensive research has focused on incorporating additives and modifying bitumen. Studies have demonstrated that adding polymers to asphalt binders improves the adhesion between aggregate and binder, leading to enhanced pavement performance. However, the chosen additive must be both structurally effective and economically viable. Plastic waste, particularly in developing countries like India, presents a major environmental challenge due to its non-biodegradable nature. Among various plastics, Low-Density Polyethylene (LDPE) has been identified as an effective bitumen modifier, even when derived from reclaimed waste materials. This

study investigates the feasibility of using reclaimed polyethylene from OMFED milk packets as a stabilizer in Stone Mastic Asphalt (SMA), Bituminous Concrete (BC), and Dense Bituminous Macadam (DBM) mixes. The Marshall Procedure was used to determine the Optimum Binder Content (OBC), which was found to be 4% for SMA and 4.5% for both BC and DBM when using stone dust as a filler. When fine aggregate was partially replaced with granulated blast furnace slag and fly ash, the OBC increased to 5% for SMA and 4% for BC and DBM. The Optimum Polyethylene Content (OPC) was determined to be 2% for SMA and DBM and 1.5% for BC with stone dust as a filler. However, when slag and fly ash were incorporated, the OPC was consistently found to be 1.5% across all mix types. To assess the impact of polyethylene as a stabilizer, performance evaluations were conducted, including the Drain Down Test, Static Indirect Tensile Strength Test, and Static Creep Test. The results indicate that incorporating OMFED polyethylene significantly enhances key mix properties, such as Marshall Stability, drain-down resistance, and indirect tensile strength. These findings highlight the potential of using reclaimed polyethylene as a sustainable and effective modifier for improving the performance and longevity of bituminous pavement mixtures.

IMPROVING THE STRENGTH AND DURABILITY OF PERVIOUS CONCRETE PAVEMENTS THROUGH CEMENT REPLACEMENT AND FIBER REINFORCEMENT

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Pavements are engineered surfaces designed to bear traffic loads and ensure durability. They are classified into **rigid** and **flexible** pavements based on their structural behavior. **Rigid pavements** are constructed with high-strength cement concrete slabs that distribute loads efficiently over a wide area with minimal deformation. In contrast, **flexible pavements** consist of asphaltic or bituminous materials placed over compacted granular layers, allowing them to flex under traffic loads. An alternative to conventional pavement systems is **pervious concrete**, a “no-fines” concrete with a high void content (15-25%) that allows rainwater to infiltrate the ground, reducing surface runoff and aiding groundwater recharge. Composed of coarse aggregates, cement, admixtures, water, and sometimes fine aggregates, pervious concrete is gaining popularity due to its cost-effectiveness, eco-friendly

properties, and potential to address urban waterlogging and declining groundwater levels. This pervious concrete presents a sustainable solution for low-traffic roads, sidewalks, parking lots, and green infrastructure. India faces a significant water crisis, with groundwater levels declining by over 30 meters in some regions due to excessive extraction and insufficient recharge. **Pervious pavements** offer an effective solution to mitigate these issues by enhancing water permeability and replenishing groundwater reserves. This research explores the feasibility of using **Ground Granulated Blast Furnace Slag (GGBS) and cellulose fibers** in pervious concrete to improve its mechanical properties and durability. The study involves designing various mix proportions, assessing **compressive strength, tensile strength, flexural strength, Young's modulus, and permeability**, and developing a custom permeability test setup due to the lack of standardized methods. By optimizing pervious concrete with sustainable materials, this study aims to establish it as a viable alternative for pavement construction, particularly in India, where labor costs are low, and the need for water conservation is urgent.

PARTICIPATION OF SKILL DEVELOPMENT PROGRAMME IN EMPOWERMENT OF WOMEN

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The women are most beautiful creation of God and empowered women most powerful and beautiful creation of God and our nature and its very urgent for our today's society .The objective was to study the contribution of skill development in empowerment of rural women. The present study Was conducted in a village of Bhualpur khanav , District of Varanasi selected randomly , For collecting data through questionnaire and interview schedule . A sample of 100 rural women respondent were taken randomly. A field survey was done to study the contribution And awareness of rural women about skill development programme which was started for women empowerment. It was observed that respondent be longed to above 15 age group. So it can be concluded that 33percent respondent were aware and benefited from skill development programme but still there are women, who are unaware of these programme they only knows the rename. So it necessary to make these programmer each able to the rural women .so they can get benefit. A programme is successful when it benefited to maximum. Rural women are more benefited when they will use the available opportunities and skill development programme which are started by Indian government.

ASSESSMENT OF THE LOW-COST SOLAR-POWERED ELECTRIFIED FENCES: HUMAN-ELEPHANT CONFLICT MITIGATION IN SONITPUR DISTRICT OF ASSAM

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The impacts and consequences associated with human-elephant conflict are highly catastrophic in nature. Sonitpur district is a part of the North-Bank landscape which was categorized by WWF as a high-priority area for conservation of endangered Asian elephants. Community-based field surveys were organized in 25 fence sites located all over the district. 60 key-informant interviews and 35 focus-group discussions were organized in the respective fence sites. A criterion consisting of a list of conditions was prepared based on Ostrom's principles for the purpose of rigorous analysis of the qualitative data. Based on the criterion, a semi- structured questionnaire was also prepared which was being pilot-tested before finalization of the questions. The power fence assessment survey exposed that majority of the fence sites (80%) were functioning effectively in the respective study area and are being successfully maintained either by the community or by a third party (WWF, Forest department, Apeejay). Only three out of 25 (12%) fences were categorized as failed/poorly maintained sites. Two out of 25 (8%) fences could not be categorized as either successfully maintained or failed/poorly maintained sites (unclassified). In the successful and the unclassified fences (88%) sites, community maintenance and participation was present in 52% of the sites, third party involvement was in 39% and combined involvement was present in 9% of the sites. Since the fence wires were single-stranded located at a height of 5 feet from the ground, except one which was observed to be triple-stranded, it did not impede the movement of the regular users. The categorization of the fences into successful, unclassified and failure was being made based on the conditions enlisted in the criterion/checklist. Lastly, suggestions such as organizing meetings and awareness campaigns, filling up the gaps, strict enforcement of rules and regulations were being recommended to ensure long-term effectiveness of the fences and promote harmonious co-existence of both elephants and human beings.

हिंदी साहित्य में यथार्थवाद–प्रवृत्तियां और संभावनाएं

रेखा गावड़ियां

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हिंदी साहित्य में खास तौर से 1970 और 1980 के दशकों में प्रेमचंद की यथार्थवादी परंपरा का जाप तो बहुत हुआ लेकिन उसे समझने और आगे बढ़ाने के प्रयास कम ही हुए । यदि आधुनिकवादी लेखकों तथा आलोचकों ने उसका मजाक उड़ाया, तो कई प्रगतिशील जनवादी कहलाने वाले लेखकों व् आलोचकों ने उस पर तरह तरह के बरगलाने वाले सवाल भी उठाकर उसे खारिज करने के भरसक प्रयास किये । मसलन किसी ने कहा कि प्रेमचंद ग्रामीण यथार्थ जीवन से जुड़े लेखक थे । आज के महानगरीय यथार्थ का चित्रण उनकी परम्परा में नहीं किया जा सकता , किसी ने कहा कि प्रेमचंद का समय कुछ और था हमारा समय और है । और इस बदले हुए समय में प्रेमचंद का आदर्शोन्मुखी यथार्थवाद संभव नहीं हैं । तो किसी ने कहा कि प्रेमचंद आदर्शवादी थे । यथार्थवादी तो वे अपनी अंतिम कुछ रचनाओं में ही हुए थे। दूसरी तरफ उत्तर आधुनिकतावादियों ने अपने विखंडनवाद से यथार्थवाद के मूल आधार समग्रता का ही खंडन किया तो जादुई यथार्थवादियों ने यथार्थवाद के सभी पुराने रूपों को वर्तमान समय के लिए बेकार हो चुका बताया और उत्तर आधुनिकतावादियों के मार्क्सवादोत्तरश और श्यथार्थवादोत्तरश के नारों से उसका तालमेल बिठाकर वर्तमान में (अर्थात् सोवियत संघ के विघटन के बाद और पूँजीवादी भूमंडलीकरण के वर्तमान दौर में) उसी को एकमात्र सही और संभव बताया आश्चर्य की बात यह है कि हिंदी साहित्य में वामपंथी लेखकों और लेखक संगठनों की संख्या कम न होने पर भी यथार्थवाद पर कोई बड़ी बहस नहीं चली, जबकि उनको ही साहित्य में यथार्थवाद की जरुरत सबसे ज्यादा थी । उत्तर आधुनिकतावाद के संदर्भ में फ्रेडरिक जेमेसन का नाम अवश्य लिया जा रहा, लेकिन इस पर ध्यान नहीं दिया गया कि उन्होंने आज के पूँजीवाद के दौर में यथार्थवाद के नये रूपों के आविष्कार की जरुरत कहा था ।

हिन्दी कविता में राष्ट्रवादः स्वतंत्रता आंदोलन में आज तक

प्रिया कुमारी

बी. ए. तृतीय वर्ष, श्री टैगोर महाविद्यालय, कुचामन सिटी

स्वतंत्रता भारतीय यज्ञवेदी का वह पुरूष है, जो हमे आज तक सुगन्ध दे रहा है और आगे भी देता रहेगा। हिन्दी भाषा का राष्ट्रीय चरित्र दिनोदिन निखरता गया। भारत के बुद्धि जीवियों ने राष्ट्रीय भाषा को संगठित और राष्ट्रव्यापी रूप देने के लिए अखिल भारतीय राष्ट्रीय कांग्रेस की स्थापना 1885 ई. में की थी। कांग्रेस अधिवेशनो के साथ राष्ट्रभाषा सम्मेलन होने लगे। राष्ट्रीय आंदोलन के समय सभी नेता हिन्दी के समर्थक थे। बालगंगाधर तिलक ने महाराष्ट्र की भावना को मुखरित किया और भारतवासियो से आग्रह किया कि ये हिन्दी सीखे। हिन्दी भाषा के ऐतिहासिक ज्ञान में आदिकाल से ही ओज और राष्ट्रीय चेतना जागरण में हिन्दी का कुशलता से प्रयोग होने लगा था। रासो साहित्य में चन्द्रबरदायी जैसा कवि पृथ्वीराज रासो जैसा महत्वपूर्ण काव्य लेकर अवतरित हुआ। यह महाकाव्य युद्ध और प्रकृति वर्णन को लेकर भारतीयों में राष्ट्रवादी चेतना जगाने वाला काव्य है। इसी तरह भक्तिकाल एक उत्सवधर्मी काव्य है जो भक्तो द्वारा रचा गया। यह काव्य परम्परा से लोक परम्परा को अपने में समेटे लोकमंगलकारी काव्य सिद्ध हुआ रीतिकाल काव्य की रचना प्रधानत श्रृंगारस की है। इसीलिए स्वतंत्रता यज्ञ में कोई विशेष भूमिका निभाने में समर्थ सिद्ध नही हो सका, लेकिन आधुनिककाल से अब तक राष्ट्रीय चेतना जागरण में हिन्दी ने जो सेवा भारतीय समाज की की है वह हम सभी भारतीयो के लिए अपनी राष्ट्रभाषा पर गर्व का विषय है। आधुनिक हिन्दी साहित्य के प्रवर्तक भारतेन्दु हरिशचन्द्र ने गद्य भाषा के महत्त्व को समझा इसीलिए पद्य के साथ गद्य में भी बड़े पैमाने पर साहित्य का सृजन प्रारंभ हो गया। इस तरह की प्रत्येक साहित्यिक कृति मे अंग्रेजो के शोषणवादी चरित्र को खूब उभारा था, क्योकि अंग्रेजो के शोषण प्रवृत्ति अत्यन्त घिनौनी हो गई थी। भारतेन्दु युग में जीवन की यही समस्याएँ कविता का विषय बन गई। इस युग की कविता में अखबारीपन भी देखा जा सकता है। जिसने भारतीयो की आर्थिक, सामाजिक दुर्दशा की और लोगो का ध्यान खींचा।

''अग्रेज–राज सुख साज सजे सन भारी।
पै धन विदेश चलि जाति इहै अति ख्वारी।

इस काल में कवियो का ध्यान भाषा समस्या की और गया। भारतीय चेतना के रूप में भाषा समस्या की ओर कवि का ध्यान जाना विशेष बात थी। भारतेन्दु कविताओ मे आजादी के यज्ञ के प्रति

सच्ची सहभागिता देखी जा सकती है। इसके साथ साथ इन्होने कवि वचन सुधा– हरिशचन्द्र मैगजीन के माध्यम से आम जन को खूब जाग्रति प्रदान की। भारत दुर्दशा और अन्धेर नगरी नाटक उनके स्वतंत्रता यज्ञ में स्वयं की आहुति देने में जीवन्त प्रतीक है।

महिला सशक्तिकरण और सांस्कृतिक स्थिरता

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महिला सशक्तिकरण के इस दौर में महिला पुरुष जाति की सोच में परिवर्तन की राह ढूंढ रही है। सशक्तिकरण एवं शिक्षा के बीच संबंध महिला का विकास शिक्षित होने में ही निहित है। तभी वह आर्थिक तौर पर सशक्त बन सकेगी। आधुनिकता की और अग्रसर करने में भी शिक्षा सहयोगी है। एक पुरुष जितना महत्वपूर्ण है एक महिला भी उतना ही महत्वपूर्ण है। महिलाओं के श्रम एवं प्रयत्नों से समाज की भलाई होती है। महिला बच्चे की प्रथम गुरु मानी जाती है। मां द्वारा बच्चें की शारीरिक ,आध्यात्मिक एवं मानसिक पालन होती है। इस पर भी महिलाओं को भेदभाव का सामना करना पड़ता है। भारतवर्ष में महिलाओं को शारीरिक रूप से कमजोरनैतिक रूप से अविश्वसनीय, आर्थिक रूप से बोझ एवं बौद्धिक रूप से कमजोर माना जाता है।गंभीर आध्यात्मिक गतिविधियों से उन्हे दूर ही रखा जाता है। पुरुषों को प्रभावी स्थान प्राप्त करने की शिक्षा दी जाती है जबकि स्त्रियों को सेवा भाव की ।इस इकाई में इस बात का विश्लेषण किया गया है कि इस पुरुषवादी एवं भौतिकवादी संस्कृति में महिलाओं के सामने किस प्रकार की चुनौतियां आती हैं। इसमें कुछ विषयों पर प्रस्ताव किए गए हैं जिन्हें अपनाकर महिलाएं अपनी शक्ति प्राप्त कर सकती हैं तथा समाज व परिवार में उन्हें पुरुषों को पूरक के रूप में उनके समान दर्जा प्राप्त कर सकती है। इसमें बताया गया है कि जो समाज महिलाओं का सम्मान करता है वह समाज आध्यात्मिक एवं मानवीय मूल्यों का भी सम्मान करता है। एक सशक्त महिला को खुद पर गर्व होता है और उसे अपने स्त्री होने पर खुशी होती है।स्थापित सांस्कृतिक वृत्ति के अनुरूप अनेक महिलाएं खुद को शारीरिक मानसिक बौद्धिक एवं भावनात्मक रूप से पुरुषों की तुलना में अयोग्य मानती है और उन्हें लगता है कि वह सब कुछ नहीं कर सकती जो एक पुरुष कर सकता है। सांस्कृतिक स्थिरताः सांस्कृतिक स्थिरता का तात्पर्य है कि लोग अपनी संस्कृतिमूल्य और परंपराओं

के प्रति जागरूक और सम्मान के साथ अपने जीवन को अच्छे ढंग से जीने के लिए सशक्त हो तथा समाज में सक्रिय भूमिका निभा सके। जैसे–विभिन्न संस्कृतियों का सम्मान –इसके द्वारा यह सुनिश्चित किया जाता है कि हम सभी संस्कृतियों को सामानरूप से महत्व दे और उनका सम्मान करें। सांस्कृतिक विरासत का संरक्षण– इसके द्वारा लोगों को अपनी सांस्कृतिक विरासत को सुरक्षित करने और आने वाली पीढियां तक इसे पहुंचाने में मदद करता है। संस्कृततिक विविधता को बढ़ावा –इसके द्वारा विभिन्न संस्कृतियों के बीच समझ विकसित करना तथा सह– अस्तित्व को बढ़ावा देना है। सामाजिक सांस्कृतिक असमानताः–सामाजिक सांस्कृतिक असमानता में लिंगानुपातमात्र मृत्यु दरकुपोषणशिक्षालिंग आधारित हिंसाआदि का समावेश किया जाता है। सांस्कृतिक स्थिरता को सतत विकास का एक महत्वपूर्ण पहलू माना जाता हैंजो सामाजिकआर्थिक और पर्यावरणीय स्थिरता को बढ़ावा देने मंम मदद करता है। सांस्कृतिक स्थिरता के अंतर्गत निम्न घटकों का अध्ययन किया जाता है :–सांस्कृतिक विरासत का संरक्षणसांस्कृतिक विविधता का सम्मानसांस्कृतिक पहचान का विकास सांस्कृतिक आदान–प्रदानसंस्कृततिक विकास। संस्कृत स्थिरता को सतत विकास की दिशा में पूरी की जाने वाली एक पूर्व शर्त भी माना जा सकता है। हालांकि सतत् विकास के सामान्य ढांचे के भीतर सांस्कृतिक स्थिरता का सैद्धांतिक और वैचारिक समझ अस्पष्ट बनी हुई है। इसके परिणामस्वरुपपर्यावरण आर्थिक राजनीतिक और सामाजिक नीति में संस्कृति की भूमिका को गलत तरीके से लागू किया जाता है।

जातिवाद का जहर

मोनिका चौधरी

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जहर जीवित शरीर को मौत की नींद सुला देता है और अगर शरीर की प्रतिरोध क्षमता के कारण वह ऐसा न कर पाए तब भी शरीर की व्यवस्था में भंयकर उथल–पुथल मचा कर उसे अशक्त और बीमार तो बना ही देता है। मानव समाज के जीवित शरीर में जातिवाद ने ऐसे ही जहर का काम किया है। हमारे जिन पुरखो ने कर्म के आधार पर वर्ग तय किए थें, उन्होंने सोचा भी नहीं होगा कि कल को यह विचार जन्मना जातिव्यवस्था में परिणत हो जाएगा और इसके चलतेगर्भ में शिशु के आते ही उसकी नियति तय हो जाया करेगी। उन्हें इस बात का शायद ही अंदाजा रहा हो कि वे जो बीज बो रहे है, उससे ऐसा विषवृक्ष निकलेगा, जो आगे हजारो सालो तक गैर–बराबरी और शोषण उत्पीड़न का

आधार बन कर समाज की तदुंरूस्ती का क्षय करता रहेगा। आज हम बड़े–बड़े औद्योगिक संयत्रों, तीव्र गतिवाले परिवहन साधनो, स्वचालित उपकरणो, कम्प्यूटर और इंटरनेट के युग में जी रहे है फिर भी जन्म के आधार पर कुछ लोगों को अपना और कुछ को पराया मानने, कुछ को बड़ा और कुछ को क्षुद्र मानने की सदियों पुरानी परिपाटी कायम है। आए दिन अखबारो में इस तरह की खबरे पढ़ने को मिलती है कि फलाँ गाँव या कस्बे में किसी प्रेमी युगल को इसलिए मार डाला गया कि उन्होंने अलग– अलग जातियों से आने के बावजूद साथ में जीवन बिताने का सपना देखा था। जिस तरह शरीर में प्रवेश करने वाला जहर धमनियों में दौड़ते खून की मदद से अंग प्रत्यांगो तक पहुँच जाता है वैसे ही जातिवाद का जहर समाज के हर अंग को अपनी जकड़ में ले चुका है। पर इस समाज की जिजीविषा अद्‌भुत है। वह इस जहर को परास्त करके ही रहेगा, क्योंकि इसे जीना है और वह भी तंदुरूस्त रहकर घिसट–घिसट कर नहीं जातिवाद से फायदा उठानेवाले लोग मुठ्ठीभ्र है और उनका नुकसान झेलनेवाले बहुसंख्यक इस बात को समझने के संकेत हिंदुस्तान की जनता देने लगी है। जिस दिन उसकी सोच पर पड़े सारे झोल की चीर कर यह बात साफ–साफ दिखने लगेगी, उसी दिन इस मार्ग विष का सही उपचार शुरू हो पाएगा।

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कौशल्य व्यक्ति के जीवन को आकार देने में महत्वपूर्ण भूमिका निभाते हैं। जीवन के विभिन्न चरणों में मनुष्य नए कौशल्य अर्जित करता है और अनुभव के माध्यम से उनका उचित और प्रभावी ढंग से उपयोग करता है। महात्मा गांधीजीने बुनियादी शिक्षा के माध्यम से शिक्षा की नींव रखी। बुनियादी शिक्षा मेंबच्चों की शिक्षा के साथ–साथ उनके व्यक्तित्व का भी निर्माण होता है। हम बुनियादी और जीवनोन्मुखी शिक्षा को एक प्राचीन और पुरानी विचारधारा मानते हैं, लेकिन इससे बच्चा जीवन जीने के तरीके सीखता है। बुनियादी शिक्षा में, बच्चे स्वाभाविक रूप से खेती, खाना पकाना, सफाई, बागवानी, राशनिंग, गृहउद्योग आदि जैसे कौशल्य हासिल करते हैं। इसीलिए वर्तमान समय में कौशल्य आधारित शिक्षा की आवश्यकता बढ़ गई है। कौशल्य–आधारित शिक्षणशास्त्र से छात्रों को विविध

कौशल्य–आधारित शिक्षा की आवश्यकता है; इनमें परियोजना आधारित शिक्षण, समस्या आधारित शिक्षण, अनुभवात्मक शिक्षण, पूछताछ आधारित शिक्षण, तकनीकी शिक्षण और सहयोगात्मक शिक्षण शामिल हैं। शिक्षक प्रभावी रूप से कक्षा में प्रौद्योगिकी को शामिल कर सकते हैं, जिससे सक्रिय शिक्षण को बढ़ावा मिलेगा, जिसमें छात्र अपने नए ज्ञान के बार–बार अभ्यास के माध्यम से संलग्न होंगे। कौशल्य–आधारित शिक्षा पारंपरिक शैक्षिक दृष्टिकोण की तुलना में कई लाभ प्रदान करती है। जैसे की शिक्षा और रोजगार के बीच की खाई को कम करना,रोजगार में वृद्धि,तीव्र तकनीकी प्रगति के इस युग में,व्यक्तियों को डिजिटल युग के लिए तैयार करना । कौशल्य–आधारित शिक्षा छात्रों को वास्तविक परियोजनाओं पर काम करने का व्यावहारिक अनुभवएवं छात्रों को जीवन कौशल्य के साथ–साथ स्पष्ट उद्देश्य प्राप्त करने में मदद करता हैप् यह सीखने और विकास की कला को बढ़ावा देता है और विकसित करता है। कौशल्य–आधारित शिक्षा व्यक्तियों को अपने कौशल्य को निरंतर बढ़ाने और उभरते रुझानों के साथ बने रहने के लिए प्रोत्साहित करके आजीवन सीखने की मानसिकता पैदा करती है।यह शिक्षा उद्यमशीलता की भावना को पोषित करती है और नई चीजें सीखने को प्रोत्साहित करती है। व्यक्तियों को बाजार के अवसरों और बाधाओं की पहचान करने, बाजार की समस्याओं को सुलझाने, बाजार का आकलन करने और बाजार मूल्य बढ़ाने के लिए आवश्यक कौशल्य प्रदान कर स्वतंत्र सोच को प्रोत्साहित करता हैप्इस तरह के कौशल्य उन्हें विभिन्न परियोजनाओं की योजना बनाने और उन्हें क्रियान्वित करने, रणनीति बनाने, योजना को सफल बनाने के लिए समूह को संगठित करने और प्रेरित करने में मदद करते हैं, जिससे उनमें नेतृत्व के गुण विकसित होते हैं।

राजस्थान की महिलाओं के सशक्तीकरण में रूमा देवी का योगदान

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प्राचीन भारत से ही महिलाओं की स्थिति अत्यंत समृद्ध रही है । जहां नारियों की पूजा होती है वहां देवता निवास करते हैं ,यह लोकोक्ति इसी को चरितार्थ करती रही है समय–समय पर इतिहास में महिलाओं के योगदान को बुलाया नहीं जा सकता । राजस्थान में अनेक वीर प्रसूता महिलाओं ने राजस्थान का नाम रोशन किया है जिनमें से पश्चिमी राजस्थान में एक चर्चित नाम रूमा देवी का है जिन्होंने देश–विदेश में अपनी ख्याति प्राप्त की व महिलाओं के सशक्तिकरण में महत्वपूर्ण योगदान दिया है महिला स्वयं सहायता समूह व अपने हस्तशिल्प कौशल के कारण रुमा देवी ने देश–विदेश में

राजस्थान की महिलाओं का नाम रोशन किया है व महिला सशक्तिकरण को आवाज दी है 16 नवंबर 1988 को राजस्थान के बाड़मेर में जन्मी रुमा देवी राजस्थान की एक समाज सेवी व भारतीय पारंपरिक हस्त कला कारीगर है ।2006 में लगभग 10 महिलाओं के साथ एक सहायता समूह तैयार किया 2008 में बाड़मेर की ग्रामीण विकास चेतना संस्थान में बतौर सदस्य शामिल हो गई व 2010 में इस प्रतिष्ठित एनजीओ की अध्यक्षा बनी 2010 में आपने पहला प्रदर्शन नई दिल्ली में किया । 2018 में नारी शक्ति पुरस्कार, 20 सितंबर 2019 में कौन बनेगा करोड़पति में भाग लेकर राजस्थान की नारी शक्ति की पहचान को गौरवान्वित किया । रूमा देवी को अखिल भारतीय सम्मेलन में पेन लिस्ट के रूप में हार्वर्ड यूनिवर्सिटी ,बोस्टन द्वारा आमंत्रित किया गया। राजस्थान ग्रामीण राज्य विकास परिषद (राजीविका)की ब्रांड एंबेसडर रुमा देवी को हस्तशिल्प में बढ़ावा देने के लिए बनाया गया। व इस क्षेत्र में योगदान के लिए श्रीलंका सरकार द्वारा शिल्पा अभिमन्यु पुरस्कार प्रदान किया गया 10 जुलाई 2021 को इंडियन आइडल शो में आपने भाग लिया इंडिया टुडे के वार्षिक कवर पेज में प्रमुख स्थान प्राप्त कर चुकी रूमा देवी आज राजस्थान की ही नहीं पूरे विश्व की महिला शक्ति की मिसाल बन कर उभरी हैं ।

हिंदी नाटक और रंगमंच–विकास और चुनौतियाँ

हरेन्द्र कुमावत
हिंदी विभाग, श्री टैगोर महाविद्यालय, कुचामनसिटी

हिंदी के देशज और लोक–मानस की अनुकृतियों को उकेरने वाले कथाकार भगवानदास मोरवाल की छठी औपन्यासिक कृति सुर बंजारन है द्य यह उपन्यास लगभग मरणासन्नऔर विलुप्त होती लोक–कला का दस्तावेज भर नहीं है, बल्कि एक अलक्षित और गुम होती विरासत का सांस्कृतिक इतिहास भी है । इसे हिंदी का पहला ऐसा उपन्यास कहा जा सकता है जिसके आख्यान के केंद्र में हाथरस शैली की नौटंकी, उसकी परम्परा और सुरों की समाप्त प्रायरू दुनिया है । एक ऐसी दुनिया जिसमे अपना वृत्त, लोक में प्रचलित श्रुतियों, ऐतिहासिक–सामाजिक घटना–परिघटनाओं पर आधारित लोक–धुनों व सुरों से निर्मित किया है। हिंदी स्वदेश के साथ हिंदी विदेशों से गठबंधन करती हुई प्रतीत हो रही है। बहुरास्ट्रीय कम्पनीयों व संस्थओं के द्वारा असीम धनराशी खर्च करते हुए हिंदी के बाजार को विस्तार देने में सहायक कर रही हैं। इस तरह भारत की दृष्टी में हमेशा से विश्व एक 'परिवार' रहा है जहाँ वसुधैव कुटुम्बकम की अवधारणा को लेकर चलने वाले लोगों का जुडाव हिंदी बाजार को विस्तार देने में रहा है इसमें समग्रह जगत को एक ही परमत तत्व की अभिव्यक्ति मानते हुए टुकडों में बिखरे हुए मानव समाज को एक ही परिवार का हिस्सा

स्वीकार किया गया है तथा हिंदी बाजार 'विश्वग्राम' की परिकल्पना का नारा भारत जैसे विकासशील देश नें हिंदी बाजार को लेकर लगाया है जो मूलतः अल्पविकसित और विकासशील देशों के शोषण व दोहन के उद्देश्य से निर्देशित है इस हिंदी बाजार के चक्र की परीक्रमा में छोटे और कमजोर संस्कृति के मध्य गम्भीर संकट छाया हुआ है उसें विवेक व लोक जीवन की अवधारणा के साथ संस्कारो का पिटारा खोलकर सामने रखता है साथ ही एक नवीन प्रष्टभूमि तैयार करता है।

कंटिन्यूस मेण्डामस (निरन्तर परमादेश): पर्यावरण संरक्षण हेतु न्यायापालिका का नवाचार

Ms Mamta Dangi

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भारतीय संविधान के अनुच्छेद 32 के तहत प्रदान किये गए उपचारों को विस्तृत करते हुए भारतीय न्यायपालिका, न्यायिक सक्रियता के माध्यम से मूल अधिकारों को संरक्षित करती रही है। इसी न्यायिक सक्रियता द्वारा आवश्यकता पड़ने पर जनता के हित के लिए कानूनी सिद्धांतों की लंबे समय से चली आ रही बाधाओं को पार कर गई है। मूल अधिकारो की रक्षा करने के क्रम मे, न्यायपालिका ने कई मार्ग तैयार किये है जिन्हे नवाचार भी कहा जा सकता है, जिसमे लोकहित वाद, स्पॉट विजिट, विशे ाज्ञ समितियां और निरन्तर परमादेश आदि सम्मिलित है। निरन्तर परमादेश का उद्देश्य उन परिस्थितियों को संभालना है जिसमें न्यायालय के निर्देशों का पूर्ण पालन सुनिश्चित करने के लिए एकल परमादेश आदेश का नि पादन पर्याप्त नहीं है। यह न्यायालय को अधिकार देता है कि वह इस बात पर नजर रखे कि मामला किस तरह आगे बढ़ रहा है और इच्छित लक्ष्य को पूरा करने के लिए आवश्यकतानुसार अतिरिक्त आदेश प्रदान करें। न्यायपालिका द्वारा आदेश पारित किये जाने के बाद उस आदेश को क्रियान्वित करने का कार्य प्रशासनिक एजेंसियो का होता है,लेकिन कई बार उनके द्वारा लापरवाही और ज्ञान के आभाव मे निर्णयों को सही से लागू नहीं किया जा जाता है, जिस कारण न्यायपालिका ने निरंतर परमादेश रिट को आवि कृत किया, जिस से निर्णयों का कार्यान्वयन पूर्णतया हो सके। निरंतर परमादेश के तहत किसी वाद मे अंतिम निर्णय ना देकर अंतरिम आदेश जारी किये जाते है और समय समय पर उन आदेशों के कार्यानवयन की रिपोर्ट प्राप्त की जाती है। न्यायपालिका समय के साथ मूल अधिकारों की रक्षा हेतु नये नये मार्गो का निर्माण कर रही है।

INTEGRATING SHRAVAKACHARA PRINCIPLES IN HOLISTIC CHILD REARING: A COMPREHENSIVE APPROACH FOR NURTURING VALUES AND WELL-BEING

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Holistic child-rearing is a comprehensive approach that seeks to nurture a child's overall development by addressing physical, emotional, intellectual, and spiritual dimensions. In this context, the principles of Shravakachara, derived from Jain philosophy, offer a structured ethical framework that can significantly influence a child's upbringing. Shravakachara, which refers to the ethical and moral conduct expected of a lay follower in Jainism, emphasizes values such as non-violence (ahimsa), truthfulness (satya), non-stealing (asteya), celibacy or self-restraint (brahmacharya), and non-possessiveness (aparigraha). These values, when incorporated into parenting and educational practices, can help cultivate mindfulness, self-discipline, and ethical awareness in children. This study explores the intersection of Shravakachara and modern child-rearing practices, analyzing how ancient wisdom can be effectively adapted to contemporary lifestyles. By examining traditional Jain scriptures, along with contemporary psychological and pedagogical research, this paper aims to establish a model for integrating Shravakachara into everyday parenting. The discussion highlights the significance of non-violent communication, ethical decision-making, and minimalistic living in shaping a child's moral and emotional intelligence. Furthermore, it emphasizes the role of parents, educators, and the community in fostering an environment that nurtures virtues like compassion, honesty, and responsibility from an early age. The findings of this study underscore the relevance of Shravakachara in modern parenting, demonstrating how these principles contribute to raising children with a strong moral foundation, emotional resilience, and a sense of global responsibility. By bridging the gap between ancient ethical teachings and contemporary child-rearing methodologies, this research offers a holistic perspective on nurturing children to become conscientious and well rounded individuals.

MICROBIAL SCIENCE IN THE FOOD INDUSTRY: FROM FERMENTATION TO FOOD SAFETY

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Microbial science is fundamental to the food industry, influencing every stage of food production—from raw material processing to final product preservation and safety assurance. This paper explores the extensive applications of microbial science in food systems, focusing on the dual roles of microorganisms in beneficial fermentation processes and in ensuring food safety through contamination control and microbial monitoring. Fermentation is one of the oldest and most valuable microbial applications in the food industry. Beneficial microorganisms, including Lactobacillus, Saccharomyces, and Bifidobacterium species, are used in the production of yogurt, cheese, bread, beer, wine, and pickled vegetables. These microbes not only enhance the taste, aroma, and texture of foods but also improve nutritional content, shelf life, and digestibility. Probiotic strains are now widely incorporated into functional foods to promote gastrointestinal health, immunity, and overall well-being. Conversely, foodborne pathogens such as Escherichia coli, Listeria monocytogenes, Salmonella, and Campylobacter pose significant risks to food safety, leading to serious health issues and economic losses. To address these challenges, food industries apply advanced microbial detection techniques, sanitation protocols, and preventive systems like Hazard Analysis and Critical Control Points (HACCP) and Good Hygiene Practices (GHP).

PUBLIC AWARENESS AND POLICY INTERVENTIONS FOR ENVIRONMENTAL SUSTAINABILITY

Nikita

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Environmental sustainability is a pressing global concern, requiring collective efforts from governments, industries, and the public. While technological advancements and policy frameworks play a crucial role in mitigating environmental degradation, public awareness and active participation are equally essential. This paper explores the significance of public awareness and policy interventions in achieving environmental sustainability, emphasizing education, behavioral change, and regulatory measures. Raising public awareness about environmental issues, such as climate change, pollution, and resource depletion, is fundamental to fostering a sustainable mindset. Educational campaigns, media outreach, and community

engagement programs can drive behavioral changes that support sustainability efforts. Schools, universities, and corporate sectors must integrate environmental education into their curriculum and policies to instill eco-friendly habits. Additionally, digital platforms and social media can be leveraged to spread awareness and mobilize action on a large scale. Policy interventions serve as a backbone for environmental governance. Governments worldwide have implemented regulations, such as carbon taxes, plastic bans, and green energy incentives, to promote sustainability. Policies like the Polluter Pays Principle (PPP) and Extended Producer Responsibility (EPR) hold industries accountable for their environmental impact. Sustainable urban planning, waste management regulations, and incentives for adopting renewable energy sources further contribute to environmental conservation.

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