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SIIC VII

Sustainable India International Conference on

SUSTAINABLE MANAGEMENT, DESIGN AND ARCHITECTURE: A PATH TOWARDS SUSTAINABLE DEVELOPMENT AND INNOVATION

5th February- 8th February 2025 Online + Offline (Hybrid Mode)

Venue : Singapore University of Social Sciences

Sub Themes

1. Innovative Design Strategies for Sustainable Architecture
2. Circular Economy in Architecture and Construction
3. Building Resilience: Climate Change & Disaster-Resilient Design
4. Sustainable Urban Planning and Development
5. Environmental Justice and Social Sustainability
6. Digital Transformation in Sustainable Design
7. Energy Efficiency & Renewable Energy Integration
8. Cultural Heritage & Sustainability in Architecture
9. Governance, Policy & Sustainability
10. Education & Professional Development
11. Circular economy and Sustainable Building
12. ESG and Sustainable Development

MORE INFO

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About SI

- We feel profound happiness to introduce ourselves as an initiative of Sri Aurobindo Yoga and Knowledge Foundation, India named “Sustainable India”. Sri Aurobindo Yoga and Knowledge Foundation has been recognized as a Socio-Spiritual Organization and a Research Institute.

- “Sustainable India” works to bring true consciousness among the aspirants, Colleges, Universities and largely to communities towards bringing Sustainability as a part of their habit. The transformation can only happen by experiential learning and that’s what Sustainable India do.

- To shift the thoughts towards Sustainability we organize regular activities like International and National Conferences, Recognizing and appreciation, Online lectures on UNDP’s 17 sustainable goals, workshops and also providing the digital platform for the practitioners to showcase their work and products.

- To continue the journey of growth Sustainable India is hosting "Amritam", Sustainable India Awards and International Sustainable Conference onTechnology and management.

We are currently working with 40 Higher Education Institutions, 130 Villages, 30 Startups and Auroville and IIT New Delhi, Unnat Bharat Abhiyaan and many more.

Message from the Trustee

Dear esteemed participants,

It is with great enthusiasm that Sustainable India, an initiative of Sri Aurobindo Foundation, hosts the International Sustainable Conference on Sustainable Management, Design & Architecture. This gathering serves as a pivotal platform to explore innovative approaches and collaborative strategies aimed at advancing sustainable development in an increasingly complex world. Our commitment to environmental stewardship and social responsibility drives our engagement with diverse stakeholders, including researchers, architects, urban planners, policymakers, and industry leaders.

By convening this conference, we aim to foster dialogue and knowledge sharing on sustainable practices within the realms of management, design, and architecture. The sessions will delve into best practices, cutting-edge research, and case studies that highlight successful sustainable initiatives, providing invaluable insights into effective implementation. We recognize that the transition towards sustainability requires a multi-faceted approach; hence, we encourage contributions that highlight cross-disciplinary perspectives and inclusive solutions.

Moreover, this conference aligns with Asia's broader goals of achieving sustainable growth, as outlined in our national policies. It is our hope that the discussions and collaborations stemming from this event will not only generate impactful ideas but also empower communities and professionals to adopt sustainable methodologies in their respective fields. Together, we can pave the way to a more resilient and sustainable future, embracing innovation and creative design while addressing the pressing challenges of our time. We look forward to your active participation and are excited to see the fruitful outcomes of our collective efforts.

With Harmony,

Dr. Samarendra Mohan Ghosh

Advisor, Sustainable India

Trustee, Sri Aurobindo Yoga and Knowledge Foundation

Message from the Keynote Speaker

Dear Esteemed Colleagues,

It is with great joy that I announce my participation as the keynote speaker at Sustainable India's International Conference on Sustainable Management, Design & Architecture: A Path Towards Sustainable Development and Innovation. As Head of Sustainability at the Singapore University of Social Sciences, I am honored to collaborate with Sustainable India as a conference partner and Asian collaborator for this pivotal event.

This conference serves as an essential platform for fostering dialogue on the critical importance of sustainability in management, design, and architecture. Our collective efforts will illuminate innovative practices and strategies that can fundamentally transform our approach towards sustainable development across diverse sectors. I believe that by sharing research insights, best practices, and forward-thinking ideas, we can inspire a collaborative spirit that will propel us toward a more sustainable future.

Throughout my keynote address, I will explore the intricate relationship between sustainability and societal well-being, emphasizing how integrated approaches can create resilient communities and environments. I encourage all attendees to engage robustly with one another, seize the opportunity to exchange knowledge, and cultivate connections that will yield meaningful collaborations beyond the conference.

Together, we have the power to shape sustainable practices that not only address immediate challenges but also pioneer pathways for future innovations. Your participation is vital to the success of this endeavor, and I am looking forward to engaging in stimulating discussions that will emerge from our collective insights.

Thank you for this opportunity, and I eagerly anticipate a fruitful and enriching conference.

Warm regards,

Dr Tan Eng Joo

Head, Masters and Graduate Diploma in Sustainability Management Programme

School of Business

Singapore University of Social Sciences

Message from the Special Speaker

Dear Esteemed Colleagues,

I am honoured to announce my participation as a special speaker at Sustainable India's upcoming International Conference on Sustainable Management, Design & Architecture: A Path Towards Sustainable Development and Innovation. It is with great enthusiasm that I join as an advisor for Sustainable India and collaborate closely with all of you in this significant endeavor.

With my experience as a former professor at the National University of Singapore, I have witnessed firsthand the pressing need for innovative strategies that bridge the gaps in sustainable practices across diverse sectors. This conference serves as a vital platform where we can convene to discuss the critical intersections of management, design, and architecture, focusing on how these domains can contribute to sustainable development. As we work together, we will address challenges, share best practices, and illuminate pathways for innovative solutions that prioritize ecological balance and social responsibility.

The theme of this conference aligns perfectly with the ambitious goals we have set as thought leaders and practitioners committed to fostering sustainability in Asia and beyond. I believe our collaboration will generate rich discussions and collaborative opportunities that can lead to impactful initiatives within our communities.

I look forward to sharing insights and engaging with all attendees to explore actionable solutions that emerge from our collective expertise. Together, we can inspire positive transformations and empower future generations to carry forth the torch of sustainability. Thank you for this opportunity, and I am excited to contribute to our shared mission at this important event.

Warm regards,

Dr. Habibullah Khan

Former Professor, National University of Singapore

Advisor, Sustainable India

Message from the Conference Partner

Dear Colleagues,

I am thrilled to express my enthusiasm as we embark on this pivotal collaboration for Sustainable India's International Conference on Sustainable Management, Design & Architecture: A Path Towards Sustainable Development and Innovation. As an Advisor for Sustainable India and Director of Megaforte, I am excited to serve as a conference partner and Asian collaborator for this significant event.

This conference presents an invaluable opportunity to bring together thought leaders, researchers, and industry practitioners to engage in meaningful discussions about integrating sustainable practices across management, design, and architecture. By drawing on diverse perspectives and innovative solutions, we can collectively address the pressing challenges of sustainability in our rapidly changing world. Our partnership aims to foster an inclusive environment that celebrates collaboration and encourages the exchange of practical ideas, methods, and technologies that can drive lasting positive impact.

As we delve into the theme of sustainable development and innovation, we will explore successful case studies, research findings, and cutting-edge design principles that align with ecological integrity and societal needs. I believe that through this joint effort, we can inspire actionable strategies that not only enhance our understanding of sustainability but also empower communities across Asia to implement these principles in their respective contexts.

I encourage all participants to engage deeply in the sessions, share their insights, and connect with fellow attendees. Together, we are shaping a brighter, more sustainable future through innovative collaboration. I look forward to seeing you at the conference and to the fruitful discussions that lie ahead.

Warm regards,

Tom Smahon

Advisor, Sustainable India

Director, Megaforte

Message from the Guest Speaker

Dear Colleagues and Associates,

I am delighted to be a part of Sustainable India's International Conference on Sustainable Management, Design & Architecture: A Path Towards Sustainable Development and Innovation. This conference represents a significant opportunity for experts, researchers, and practitioners to converge and explore transformative ideas and practices that foster sustainability in various sectors. Sustainable India, known for its commitment to advancing green practices and innovative solutions, is hosting this conference to highlight interdisciplinary approaches toward sustainable development.

At IIT Bhilai, we recognize the critical importance of integrating sustainability within engineering, design, and architecture, and we are excited to be partnering with Sustainable India to drive impactful discussions and initiatives centered on these themes. The proceedings from this conference will provide a platform for sharing groundbreaking research, case studies, and success stories that can influence policy-making and inspire future projects that prioritize ecological balance and social equity. We encourage all participants to engage actively, share insights, and forge collaborations that extend beyond the conference.

Together, let us pave the way toward a sustainable future, where innovation aligns with the principles of environmental stewardship and responsible design.

We look forward to your active participation in this meaningful dialogue.

Warm regards,

Rajiv Prakash

Director, IIT Bhilai

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A Scientometric Exploration of Indian Institute of Technology Bhilai's Contributions to Sustainable Development Goals Research

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Abstract – Scientometric and bibliometric analysis of publications in the realm of Sustainable Development Goals (SDGs) from 2017-2024 within the Indian Institute of Technology Bhilai provides a comprehensive overall objective of determining the contributions by IIT Bhilai in the realm of SDG-related research, both in terms of volume of publications, citation impact, collaboration pattern, and thematic focus. The number of SDG-related documents identified in the Clarivate Analytics Web of Science (WoS) database is 164. Analysis tools applied in the process include Bibliometrix R-package and Microsoft Excel for extracting and visualizing data. Publication output growth shows a steady rise at an annual growth rate of 54.78%, showing a growing interest in research with respect to sustainability. The average citation per document was 10.24, indicating that IIT Bhilai's research is well-regarded within the academic community. International collaboration was prominent, with 35.06% of the documents involving co-authorship with global partners, highlighting IIT Bhilai's active engagement in international research networks. The analysis also reveals the prominence of certain SDGs, particularly in areas like health and socio-economic development, while identifying potential research gaps in other SDGs. Findings Thus, the study reflects that IIT Bhilai has been a major contributor to the global agendas of SDGs and stands as an asset for policy and strategic planning and future research. In this context, it refers to academic institutions as founding in the endeavour to face the challenges of the earth through collaborative research and innovation.

Keywords – Sustainable, SDG, Scientometrics, IIT, Citation.

A Survey on Hindi Text Classification Using Information Extraction and Natural Language Processing

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Abstract – Recent developments in Information Extraction and text classification have been made possible by Natural Language Processing, particularly natural language text analysis. Text processing techniques have been transformed by utilizing deep learning and machine learning, which have produced outstanding outcomes. Recently, exceptional results on NLP tasks have been achieved using various deep learning architectures, including CNN, LSTM, and BiLSTM. Classification of text documents is effectively addressed in English with acceptable methods and resources, but there are no standard setup rules available for the Hindi language. This research study's primary goal is to give a survey on Information Extraction and Text Classification in Hindi using NLP and Deep Learning. The review study demonstrates that research on categorizing the low-resource and morphologically rich Hindi language written in Devanagari has been restricted owing to a requirement for a sizable labeled corpus. The study includes summarizing the existing models and comparing the utilization and percent contribution of the current Hindi-based Information Extraction and classification methods.

Keywords – NLP-Natural Language Processing, NLU-Natural Language Understanding, HTC-Hindi Text Classification, ACE-Automatic Content Extraction, BiLSTM-Bidirectional Long Short-Term Memory, KNN-K-nearest Neighbours.

Advancements and Challenges in Automatic Text Summarization for Hindi: A Systematic Literature Review

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Abstract – Text summary refer to the process of condensing long text sections into brief, logical summaries. These generated summaries preserves the document's main ideas. Automatic text summarization (ATS) is a common problem in machine learning and natural language processing.Since around 1958[1] the name automatic text summarization (ATS) has been widespread and an important area of research.Hindi-specific automated summarization has become crucial due to the growing availability of Hindi texts in a variety of fields, including administration and education. There is no proper method for summarizing literature in Hindi, despite the language being widely used in India and its surrounding nations. With an emphasis on their use with Hindi text, this study provides a thorough analysis of ATS methodologies. It highlights the gaps in the current research and talks about the fundamental approaches, major problems, and possible remedies. This study focuses on addressing the unique linguistic challenges of Hindi by developing an innovative abstractive summarization model. Leveraging transformer-based pre-trained language models fine-tuned on Hindi text, our approach generates summaries that are contextually accurate, semantically rich, and linguistically coherent. Compared to existing extractive methods, which often lack fluency and contextual relevance, the proposed model demonstrates superior performance, achieving an average ROUGE-1 score of 68.5% and a BLEU score of 42.3%.This paper intends to promote the development of efficient, language-specific summarizing tools and further research in Hindi text summarization by providing a thorough review of ATS characteristics and future directions.

Application of GIS-ANN Model for Urban Sprawl Management in Shimla

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Abstract – Analysis of changes in land use and land cover (LULC) is a methodical approach that supports the understanding of both physical and non-physical interactions with the natural environment and the goal of environmental sustainability. Research on the spatiotemporal shifting patterns of LULC and the simulation of future scenarios provides a com- prehensive picture of current and potential future development. This research uses multi-temporal remotely sensed big data from 2014 to 2024, which is a 10-year period, to model the potential for spatiotemporal change transition and future LULC simulations. The CA-ANN method, using the QGIS MOLUSCE plugin, further processed the independent variables. This paper outlines a study that used remote sensing and GIS technology to measure the spread of urban activity throughout the city from 2014 to 2024. Remote sensing and geographic information system are very effective tools for collecting, analysing and interpreting land use data, and on the other hand, multi-criteria valuation (MCE) allows users for decision-making by considering various factors affecting the process of the prediction. Physical and social driving factors significantly influence the terrain patterns, as the results demonstrate. The study area's impermeable surface increased significantly from 19.13% to 37.10% over the past 10 years, whereas agricultural increased somewhat from 39.47% to 39.70%. Consequently, barren land dropped from 14.60% to 5.46%, and dense forest cover dropped from 26.79% to 9% to 17.75%. An intriguing pattern of land use is seen that land shifts from dense forest to horticulture first and then to build up because of the fact of horticulture being a significant economic resource in the surrounding rural area. The findings from this research suggest that this methodology can be used to manage sustainably the dynamic process of urban sprawl in this local scenario.

Keywords – 1. Sustainability 2. Urban Sprawl 3. Remote Sensing 4. GIS 5. Image Processing

Artificial Intelligence in Organizational Behaviour

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Bhumika Desmukh
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Abstract – The paper explores and analysed the role of Artificial Intelligence (AI) in transforming organizational behaviour, particularly in decision-making, communication, team dynamics, and employee engagement. AI tools like sentiment analysis, predictive analytics, and virtual assistants are improving workplace efficiency and providing valuable insights into employee behaviour. The integration of AI also supports unbiased hiring, personalized training, and predictive performance management. However, challenges such as ethical issues, data privacy, and potential job displacement are significant concerns. Through case studies and advancements in AI, the paper stresses the importance of responsible AI implementation to build sustainable, human-centric workplaces. The study concludes by offering recommendations for using AI to foster adaptive, inclusive, and innovative organizational environments.

Keywords – Team Dynamics, Sentiment analysis, predictive performance management, human centric.

Avani Kumaon

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About – Nestled in the Kumaon region of Uttarakhand, Avani, a non-governmental organization (NGO), has been working with rural communities for 25 years to improve livelihoods through the revival of traditional knowledge combined with contemporary technological interventions. The organization develops natural and closed-loop value chains to create sustainable economic opportunities for the rural communities.

Avani's approach remains grounded in its core principles: prioritizing women, ecology, and economics in all its initiatives. These values are central to its programs, including the Avani Textile Program, the Avani Bio-resource Centre (which generates electricity from the environmentally hazardous pine needles, providing alternative income for villagers while mitigating forest fires), and the Abhivyakti School (an alternative educational initiative). Community living and ecological regeneration are integrated into every project, reinforcing Avani's commitment to sustainability.

The sustainable green infrastructure at Avani stands as a testament to the natural beauty of traditional Himalayan construction and contemporary architectural and technological advancements. The design of its main campus and four decentralized village centers incorporates locally sourced, eco-friendly materials that are suited to the region's ecology. Given the region's vulnerability to environmental hazards such as landslides and earthquakes, these buildings are designed using natural and locally available mud, stone, and wood, which were used in traditional Himalayan construction and are proven to be resilient against the region's environmental challenges.

Sustainable Infrastructure:

The roofs, made of grass wood, and the stone and mud walls, help regulate temperature during the harsh winter months. Additionally, stepping up its work along the natural pigment value chain, Avani has developed 100% natural and safe wall colors and wood stains. The campus operates on a closed-loop resource cycle, ensuring sustainability in all operations.

Avani's main campus has installed a solar power system across its buildings and also connected to the main grid to run its operations. A combined capacity of 9 kW is ensured as a backup to meet the energy needs of its dyeing and weaving operations, community kitchen, school, and the residents. In addition, 25 kW of solar energy is generated and supplied to the government. If the campus's energy consumption from the grid is equal to or less than the green energy supplied, the electricity bill is waived—a unique arrangement with the government that further reduces the campus's environmental footprint.

Given the region's mountainous terrain and water scarcity, and abundance in monsoon rains, Avani has developed innovative rainwater harvesting system beneath each building, as well as a waste water management system to prevent any water from going to waste. The harvesting system is designed with a capacity of 8 lakh liters of water, which stores 16 lakh liters throughout the year and the treatment plant recycles 3 to 4 thousand liters of wastewater daily. This circular water flow also supports the carbon-neutral operations of the textile program and exemplifies Avani's commitment to sustainable living and ecological preservation.

The green infrastructure at Avani supports the following sustainable initiatives in the rural Himalayas:

Avani Textile Program:

The program focuses on the cultivation of natural dye plants, dye extraction, and the preservation of traditional hand-spinning and hand-weaving techniques. In 2005, Avani established the *Earthcraft Self-Reliant Cooperative* with 45 members and handed it over the Textile program operations, to create sustainable livelihoods for small-scale farmers and vulnerable women in the Kumaon Himalayas. Today with 524 members, the cooperative works to revive natural fibers and local handicrafts, while providing stable employment opportunities for rural women from marginalized social and economic backgrounds. Over the past two decades, the cooperative has positively impacted the lives of hundreds of individuals.

At present, the cooperative is fully self-reliant and operates through a decentralized model that spans the entire production chain. This includes cultivation of indigo to the collection of various natural dyes, and Eupatorium - an invasive plant species - from its members, extraction of natural pigments, to yarn dyeing and spinning, hand weaving, and marketing handmade products. Through extensive experimentation, the team has developed a unique range of hand-spun and hand-woven items using natural, circular processes, including natural pigments and dyes.

Further, under the program, 7600 dye yielding plants have been planted in the nearby villages, improving soil fertility and increasing the water retention capacity of the soil, which indirectly contributes to groundwater recharge in the region.

This interconnected model emphasizes the importance of community engagement and transparency, ensuring that every step in the production process respects the dignity of the artisans and the health of the environment.

BIM Based Cost Optimization of Retrofitting Strategy

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Abstract – Seismic retrofitting of existing reinforced concrete (RC) structures is critical for enhancing their resilience against earthquakes, particularly in regions with significant seismic risk. This study aims to optimize seismic retrofitting solutions for existing RC buildings through a cost-effective, Building Information Modelling (BIM)-based approach. The study focuses on buildings located in seismic Zone IV with medium soil conditions as per Indian seismic code IS 1893:2016. The research evaluates the seismic vulnerability of these buildings using specific building configurations and specifications, providing insights for effective retrofitting strategies. The study employs Microsoft Excel for life cycle cost analysis, MIDAS Gen for structural evaluation, and Autodesk Revit for 3D BIM modelling. Seismic performance is assessed using advanced techniques, including pushover analysis and response spectrum analysis, for both pre and post retrofitting scenarios. Various retrofitting techniques, such as bracing systems, shear wall insertion, and Fibre-Reinforced Polymer (FRP) wrapping, are evaluated for their efficacy in enhancing structural performance under seismic loading. BIM facilitates efficient visualization, streamlined data integration, and enhanced collaboration among stakeholders, ensuring accurate implementation of retrofitting measures. A key contribution of this research is the integration of cost optimization into retrofitting strategies, facilitating a balance between safety enhancements and economic feasibility.

Keywords – Optimized Seismic Retrofitting, Building Information Modelling (BIM), Life cycle cost analysis, Seismic Vulnerability, Retrofitting techniques.

Business-Government Relationship for Sustainable Development of Women Entrepreneurship: An Analysis of the Indian Manufacturing Sector

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Abstract – Women entrepreneurship is an essential driver of the economic growth of the nation. It promotes sustainable business practices and increases women's participation in economic development. In this regard, government intervention plays a significant role in promoting women entrepreneurship. Thus, this study aims to investigate the impact of government intervention on the sustainable development of women entrepreneurs. This study uses the World Bank Enterprise Survey data set for India to investigate the objective. Using the Likert scale and regression analysis, it is found that women's participation is much less in entrepreneurship activity in India than that of men. They are mostly interested in doing small business and are unable to get the benefits of government-provided benefits for the promotion of their business. Regression results show that government support, tax inspection, and informal payment significantly impact the firm's sales, which are led by women entrepreneurs. Policymakers and economists should focus more on increasing female entrepreneurship to boost economic productivity. Further, the government should ensure the proper implementation of the government schemes so that women entrepreneurs can get the benefits. Tax rates and tax administration may give some relaxation to women-led enterprises to increase the number of women entrepreneurs for sustainable business practices and reduce gender inequality in business activity.

Keywords **–** Women Entrepreneurs, Sustainable Development, Business-Government relationship, Indian Manufacturing Sector.

Designing for Resilience: Biomimicry in Architectural Design: Emulating Nature for Sustainable Solutions

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Abstract – This thesis investigates the transformative potential of biomimicry in architectural design, positing that nature serves as an invaluable repository of innovative solutions for contemporary sustainability challenges. By emulating biological processes and structures, architects can develop designs that not only enhance aesthetic appeal but also significantly reduce environmental impact. The research delineates the three fundamental levels of biomimicry—organism, behaviour, and ecosystem—and elucidates how these principles can be systematically integrated into architectural practice.

Through a comprehensive analysis of select case studies, including the National Aquatics Center in Beijing and Council House 2 in Melbourne, this study highlights successful implementations of biomimetic strategies that yield substantial energy savings, optimize resource utilization, and improve occupant comfort. Each case study is meticulously examined to reveal the design inspirations drawn from nature, the sustainable outcomes achieved, and the challenges encountered during the design and construction phases.

The findings underscore the efficacy of biomimicry as a catalyst for innovation within the architectural discipline, advocating for a paradigm shift towards designs that are inherently sustainable. Furthermore, the thesis addresses barriers to the widespread adoption of biomimetic principles, such as material limitations and regulatory constraints, while proposing pathways for overcoming these challenges through interdisciplinary collaboration among architects, engineers, and biologists.

Ultimately, this research contributes to the growing discourse on sustainable architecture by demonstrating that biomimicry not only offers practical solutions but also fosters a deeper connection between built environments and natural ecosystems. By harnessing nature's wisdom, architects can create resilient structures that harmonize with their surroundings and promote ecological stewardship in an era marked by environmental uncertainty.

Keywords **–** Biomimicry, Architectural Design, Sustainable Innovation, Environmental, Thermal Regulation, Resource Efficiency, Interdisciplinary Collaboration, Ecological Design

Designing for Resilience: Innovative Approaches to Climate Change and Disaster Risk Management

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Abstract **–** With evidenced by climate change impacts, novel approaches to sustainable management, design, and architecture are now essential. This paper investigates how resilient design is crucial to fighting climate change as well as disaster risk management. The resilience of communities to climate related disaster can be improved leveraging advanced technologies and adaptive strategies. This paper provides case studies, effective strategies and relevant policy recommendations highlighting the indispensable role that governments, organizations and communities play in building a sustainable future.

Some effective strategies highlighted by this research include promotion of circular economy practices (resource efficient with less use of waste) and the setting up of early warning systems that leverage real time data to communicate climate threats in advance to communities. The paper also emphasizes the importance of stakeholder engagement particularly of local knowledge and need during the resilience planning.

Keywords **–** Climate Change, Resilient Design, Disaster Risk Management, Sustainable Architecture, Nature-Based Solutions, Smart Infrastructure, Community Engagement, Adaptive Strategies, Urban Planning, Innovation.

Dynamics of Urban Densities: A Case of Indian Cities

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Abstract – Indian cities facing rapid and unplanned urbanization, yet few research studies have been investigated on dynamics of urban growth systematically. Analysis of dynamics of Urban Densities is crucial for developing countries like India. As India's population continues to shift from rural to urban areas, which contributes to increase in urban densities. To study and assess the spatial, social, and economic dynamics of urban densities in Indian cities, we propose a conceptual framework and strategies for sustainable and equitable urban development by optimizing urban density in cities. Five Indian cities are chosen as study areas based on socio-economic categorization and sizes of cities. In this study the urban growth within the planning area was analyzed for the year 2013 and 2024 using certain bio-physical and proximity factors affecting the growth pattern of the city. Built up area maps were generated for the various years using LANDSAT imageries. The spatial density analysis is performed through a ward wise population data from census which reveals the compactness and dispersion of urban densities spatially. Also, the study reveals the varied dynamics of urban densities of developing Indian cities with the overall positive and negative impacts on the development patterns of cities with the quality of life. By examining case studies of cities across India, the paper highlights best practices, drawing attention to the positive outcomes of urban density strategic planning initiatives. The insights derived from this research would help policymakers and urban planners to enhance the quality of life of cities and promote sustainable development.

Keywords – Indian cities; Urban Densities; Developed area densities; Quality of Life; Sustainable Development.

Early-Stage Life Cycle Cost Prediction for Construction Projects using Artificial Neural Networks

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Abstract – Life cycle cost (LCC) analysis is a comprehensive economic evaluation method that accounts for construction, operation, maintenance, and demolition costs of a building over its life span. In the construction industry, LCC is defined as the total ownership cost incurred from the inception to the end of the life span of the building. This study aims to predict the life cycle cost of a residential building during the design phase using an Artificial Neural Network (ANN) model. This approach helps to reduce LCC effectively by enabling the identification of design alternatives. ANN model incorporates seven critical input parameters: gross floor area, type of roof, number of doors and windows, number of occupants, location, number of floors, and cost-significant items (CSI). A dataset comprising 30 real-world residential buildings is used to train and validate the model, ensuring accuracy and reliability. The performance of ANN model is evaluated using statistical measures, including Mean Absolute Percentage Error (MAPE), Square of the correlation coefficient (R^2), Mean Square Error (MSE), and Root Mean Square Error (RMSE). Additionally, a sensitivity analysis is conducted to determine the impact of each design parameter on LCC, highlighting the most influential factors. This study offers a robust framework for architects, engineers, and stakeholders to accurately estimate LCC at the design phase, enabling the development of optimized, cost-effective solutions for residential buildings.

Keywords – Life Cycle Cost Analysis, Artificial Neural Network, Sensitivity Analysis, Cost Effective solutions, Design Phase Optimization.

Education Planning for Sustainable Development in India: The Need for Innovation

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Abstract – Sustainable development has become a critical agenda for India due to population growth, increasing energy demands, and environmental degradation. Sustainable development implies development that focuses on the ability of future generations to meet their needs. In the Indian context, sustainable development is crucial for achieving socio-economic development while maintaining environmental sustainability. Education planning plays a crucial role in achieving sustainable development in India. It can ensure that education is accessible, equitable, and of high-quality for all learners, irrespective of their background, gender, disability, or social status. The growing population of India poses a challenge to achieving sustainable development, as it puts pressure on resources and increases environmental degradation. The country's energy demands are also rising rapidly, leading to a growing need for sustainable energy sources. Education planning can help address these challenges by promoting sustainable practices, creating awareness about environmental issues, and empowering people to take action toward sustainable development. Education can be crucial in promoting sustainable practices such as waste reduction, energy conservation, and sustainable agriculture. By creating awareness about these issues, education can help individuals understand the impact of their actions on the environment and take responsibility for the same. Sustainable development requires new and innovative solutions to complex problems. Education planning can help foster creativity and critical thinking skills for developing new and innovative solutions. Therefore, this paper highlights the present need for innovation in education planning for sustainable development in India.

Keywords **–** education planning, sustainable development, innovation, socio-economic development, environmental sustainability, sustainable practices

Floating Utopia: Sustainable, Resilient Urban Havens, Redefining Urban Development In The Face Of Climate Challenges

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***Abstract* –** The challenges of climate change and rising sea levels have spurred interest in floating cities as sustainable solutions to overpopulation and coastal strain, reimagining urban living in harmony with marine ecosystems.

This research study explores floating cities as a sustainable response to the challenges posed by climate change and urban population growth. By integrating principles of urban planning, renewable energy, waste management, and community resilience, the study contributes to sustainable urban development discourse. It highlights the growing importance of waterfront areas, with sea level rise expected to pose significant risks by 2050 and 2100, and introduces the concept of Aquatecture—a vision of resilient urban living that connects coastal and oceanic communities. Floating structures, adaptable to rising water levels, are presented as viable alternatives to traditional urbanization, addressing the need for innovative designs that balance human survival and water interconnectivity. The cultural significance of water in global traditions, such as Hindu rituals, Japanese bathing practices, and Bangladeshi fertility symbols, reinforces the human connection to water and informs planning for floating communities. Case studies, including Oceanix Busan, illustrate the potential of interconnected platforms, sustainable materials, Biorock technology, and modular designs, which enhance resilience and adaptability. Proposed implementations, such as in the Maldives, demonstrate solutions for areas vulnerable to sea-level rise. Construction strategies like off-site production and modular techniques improve execution, while the Blue Revolution promotes ecological restoration and resource efficiency. The research study concludes that floating cities represent transformative prototypes for sustainable, resilient urban havens, redefining urban development in the face of climate challenges.

***Keywords* –** Floating cities, sustainable urban development, climate resilience

Furniture Waste Reutilization Practices in Selected Higher Educational Institutions in Vadodara City: A Circular Economy Approach

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Abstract – In the current scenario, the growing environmental concerns regarding waste management and sustainability have prompted a closer look at the reuse and recycling of materials in various sectors. In this context, higher educational institutions, which generate significant furniture waste, offer a unique opportunity to explore circular economy practices. This study investigates furniture waste reutilization practices in selected higher educational institutions of Vadodara City, employing a circular economy approach. The objectives were to assess existing practices, design and implement upcycling solutions, promote sustainability through exhibitions, and develop a booklet showcasing innovative upcycled furniture designs. Data were collected from 11 institutions using purposive sampling, with interview schedules and observation sheets as tools. The findings revealed that wooden furniture comprised the most significant waste, followed by metal, plastic, and minimal glass. Among the institutions, 9% recycled furniture waste, 82% reused it through repairs, 27% repurposed it, and 9% redesigned it. Key barriers to effective reutilization included resistance to change due to outdated policies and a need for more awareness about repurposing and redesigning practices. The study's outcomes included an exhibition of 116 upcycled furniture products and launching a design booklet to raise awareness and inspire sustainable practices. This research underscores the potential of circular economy strategies to transform furniture waste management in educational institutions, fostering sustainability and innovation.

Keywords – Furniture Waste, Reutilization Practices, Circular Economy, Repurpose, Redesign

HEC-RAS 1D–2D Coupling Simulation for Urban Floods

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Abstract – This study presents a comprehensive approach to flood analysis using GIS-based hydrological modelling, with a particular focus on the application of the Hydrologic Engineering Center's River Analysis System (HEC-RAS) in the urban area of the Mula River, located within the Wakad watershed. An analysis of data covering almost thirty years, the study integrates spatial data with the HEC-RAS model to create a detailed flood inundation mapping and flood risk analysis, providing insights into areas most vulnerable to flooding. In order to test the efficiency of the approach this research aims to assess the capability of the HEC-RAS model in simulating river overflow inundation through the combined 1D–2D hydraulic computation. The model's ability to integrate both one-dimensional (1D) and two-dimensional (2D) hydraulic calculations allows for a more accurate representation of river flow dynamics and floodplain inundation, particularly in complex urban environments like the urban areas of Mula River in the Wakad watershed. The study examines the role of the Mula River in the local hydrological system, focusing on factors like river flow, rainfall patterns, and watershed characteristics that contribute to flood occurrences. In addition, the research highlights how urbanization in the Wakad watershed area, such as increased impervious surfaces, can impact flooding patterns and exacerbate flood risks. For verification, the simulation is applied to the Mula River flood events in the Wakad watershed for the years 2007 and 2019. The model's outputs are compared with observed flood data from these events to assess its accuracy and reliability. The simulation results demonstrate a close match between the observed flood extents and the outputs generated by the HEC-RAS 1D– 2D coupled model, aligning with data from other widely used flood models. Ultimately, the findings can inform urban planners and policymakers about the need for effective flood control measures, improved drainage systems, and the importance of sustainable land-use planning in mitigating the impacts of urban flooding.

Keywords – GIS, HEC-RAS, Hydrology, Modelling, Urban-Floods, Simulation.

Indian Higher Education System For Sustainable Development Goals

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Abstract – The global sustainability agenda is having a significant impact on Higher Education (HE) for sustainable development. Education is and will always remain an area of significant importance as it is a goal in itself and a means by which other aspects of sustainable development can be achieved. Goal 4 of Sustainable Development Goals (SDGs) of United Nations (UN) promotes quality education and aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". India has the third largest system of education in the world which will enroll over seventy million students in 2023 and the 21st century HE in India is still in a state of flux and HE institutions have a key role in the implementation towards sustainability. Though every HE system strives for quality in teaching and research, differences can be noticed between endeavors for social outcome and social development. The present study advocates that with the help of HE teaching and research can improve sustainability with latest, innovative, real, new, etc. methods. HE institutions can improve with the help of all teaching and learning methods, strategies, approaches, etc. to play in human resource development of economic development with new innovative ideas and the study discusses HE for sustainability for new initiatives, ideas, perspectives, etc. regarding social empowerment, economic development, etc. of the country towards change in the 21st century education system.

Keywords – Curriculum, Higher Education, India, Sustainable Development Goals, Teacher Role

Innovative Waste-to-Resource Strategies: Building Circular Economy Models

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Abstract – Rapid urbanization has intensified the waste management challenges in cities, where global urban waste generation is expected to reach 2.2 billion tons annually by 2025. Traditional waste disposal methods strain urban systems and environmental resources, underscoring the need for a paradigm shift towards sustainable waste management within urban planning. This paper examines waste-to resource (WTR) strategies as an essential component of circular economy models in urban environments, aiming to repurpose waste into valuable resources and alleviate dependency on raw materials.

The paper explores cutting-edge WTR technologies efficient waste-to-resource flows. In addition, it discusses regulatory frameworks that enable WTR initiatives, such as waste levies, subsidies for recycling infrastructure, and extended producer responsibility (EPR). Case studies from cities that have integrated WTR models successfully, such as San Francisco's zero-waste initiative and Tokyo's waste-to-energy program, are analysed to identify best practices. By addressing both the opportunities and challenges of incorporating WTR approaches into urban planning, this paper offers a roadmap for policymakers and urban planners to foster sustainable waste management systems that align with circular economy principles. This approach has the potential to transform urban waste from a liability into an asset, paving the way for cleaner, more resource-efficient cities.

Keywords – Waste-to-resource, Circular economy, Sustainable waste management, Resource efficient cities

Life Cycle Cost Analysis of Buildings Located in Surat City using AHP

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Abstract – Life Cycle Cost Analysis (LCCA) serves as an essential framework for assessing the economic sustainability of residential buildings by estimating costs across various lifecycle phases. This study integrates the Analytical Hierarchy Process (AHP), a multi-criteria decision-making methodology, to identify and rank cost-significant and non-cost-significant factors influencing the Life Cycle Cost (LCC) of residential buildings in India. The present research investigates the LCC of residential constructions in Surat city to the phase of the life cycle that has the greatest impact on overall expenses, providing valuable insights into long-term financial constraints. A total of seventeen factors, grouped into four categories: initial cost, running or maintenance cost, environmental impact cost, and end-of-life cost; are evaluated. The prioritization of these factors is based on feedback from twenty expert respondents through a structured questionnaire. Furthermore, the study explores cost-effective alternatives, such as energy-efficient solutions and appropriate maintenance processes, to minimize the LCC. Net Present Value (NPV) method is used to analyze the collected data on the original cost, operating or maintenance costs, environmental impact costs, and end-of-life costs of the selected residential buildings. By combining economic analysis with AHP, the study provides actionable recommendations for achieving economic sustainability in the Indian residential sector. The findings contribute to a deeper understanding of cost-effective and sustainable building practices in India, offering a framework for stakeholders to optimize economic outcomes.

Keywords – Life Cycle Cost Analysis (LCCA), Analytical Hierarchy Process (AHP), Economic Sustainability, Net Present Value (NPV) Method.

Machine Learning Model to Predict Organizational Performance

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Abstract – Strategic management study revolves around Organizational Performance (OP). Research in strategic management focuses on developing strategies to improve OP as well as theories to explain variances in OP. As Applied Behaviour Analysis gave rise to Organizational Behaviour Management, so does its methodology of evaluating environmental factors before putting behaviour change strategies into action. This study discusses several types of organizational assessments used by researchers and practitioners. The role of Machine Learning in transforming organizational behaviour, particularly in decision-making, communication, team dynamics, and employee engagement. AI tools like sentiment analysis, predictive analytics, and virtual assistants are improving workplace efficiency and providing valuable insights into employee behaviour. The integration of AI also supports unbiased hiring, personalized training, and predictive performance management. However, challenges such as ethical issues, data privacy, and potential job displacement are significant concerns. Through case studies and advancements in AI, the study stresses the importance of responsible AI implementation to build sustainable, human-centric workplaces. The study concludes by offering recommendations for using AI to foster adaptive, inclusive, and innovative organizational environments.

Keywords – Machine Learning, Sentiment analysis, predictive performance management,

Need Of A Smart Brick Of Plastic-Sand Mix As A Substitute Of Conventional Clay Bricks

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Abstract – Conventional clay bricks are having various durability issues and also very bulky (in terms of its volume and weight). This increases overall weight of the building and its cost of construction. There is need to address these issues and endeavour to make a novel brick which will be lighter, smaller in volume, less water absorption and easy to join during wall construction without use of cement and water. Such innovative brick also not may need wall surface plaster. All such aspirations may be met by manufacturing a smart brick made from plastic-sand mix. It is expected that such endeavour creates new path of innovation with plastic waste after its controlled melting and mixing with coarse sand in appropriate proportion.

Resilient Celebrations- Traditional Rites: Visarjan (Immersion) Arrangements in the Ganpati festival of Pune

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Abstract – The century old and 10 days long annual Sarvajanik Ganpati festival in the city of Pune has undergone many transformations after being first established to unite people to install nationalism and patriotism and bring about a political consciousness under the guise of religious celebrations. The passing century has seen so many political, social, cultural, economic, physical and spatial transformations in the ideologies and actual physicalities of the celebrations. Aspects of physical, social and economic sustainability have changed and greatly metamorphosed due to the changing pressures and challenges of urbanisation and the changing patterns of festival celebrations. The scale of the festival has changed multifold times. The management of the festival alters with changing numbers and decades passing by. The urban development of the city has impacted the ways and manners of physical manifestations.

The last day of the 10 Day festival sees the lord paraded down a processional route and immersed into the flowing waters as per the traditional customary dictates. Environmental and ecological concerns added with cultural resilience towards the age-old traditions, without compromising the religious and traditional framework, saw many alternatives and provisions designed and developed to ensure various sustainable and contemporary options. Effective planning proposals have been worked out by the local authority to ensure the Visarjan - Immersion of the Idol into the waters. Various alternatives and elaborate arrangements have been proposed during the last few years to keep abreast with all concerns and impacts of the immersion simultaneously addressing the Cultural sentiments. All the challenges and concerns are addressed and approached from time to time to ensure the efficient planning and management of the festive celebrations. But the Zest of the festival, the enthusiasm of the devotees, the religious timeline and the cultural guidelines remain unchanged.

The present study attempts to understand the cultural requirements and the growing urban and environmental concerns over the years, of the Immersion ritual, the Visarjan of the Lord's idol, due to the scale of the festival and its religious aspects and analyse the various adaptive alternatives and enhanced opportunities for better management of the culmination of the 10 day long cultural activities.

Keywords – Ganapati Festival, Visarjan - Immersion, River waters, Idols, Environmental Issues, Cultural Rituals

Rooting Sustainability: Green HRM Practices Shaping Academia

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Abstract – Academic Institutions, especially higher academic institutions, are considered as temples where values and knowledge are imparted. It is the place where youth envision and strive towards building a better future for itself and for the nation. The academic institutions are imparting education but simultaneously they need to adopt sustainable leadership because they contribute a lot in setting an example for protecting the environment. It is high time that all internal stakeholders of academic institutions adopt effective green initiatives. The research aims to study the practice of sustainable green initiatives by students, teachers and management of higher academic institutions. It also identifies the areas where green HRM initiatives can be strengthened. It also suggests the innovative and essential strategies to develop sustainability. A total of 500 respondents are studied for the research. The data is collected using questionnaire and interview methods. The data is analysed using statistical tools (SPSS Software), excel charts and graphs. The study reveals that many green initiatives are satisfactorily practiced by the stakeholders. But many important areas of concern are identified in the research. The research also aims at proposing a framework for effective implementation of Green HRM practices tailored for academic institutions. The research concludes by suggesting the 5E model developed by the researcher to be practiced by academic institutions for being sustainable Eco-leaders.

Keywords – Sustainable development, Academic Institutions, Sustainable leadership, Green HRM

Sustainable Beauty from Within: Ayurveda-Inspired Edible Cosmetics for Radiant Skin and Hair

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Abstract – With the increasing prevalence of skin and hair disorders due to oxidative stress, there is a pressing need for sustainable and effective beauty interventions. This study investigates the efficacy of Ayurveda-inspired edible cosmetics, formulated from a curated blend of antioxidant-rich herbs, to promote optimal skin and hair health from within. By harnessing the natural power of Ayurvedic botanicals, we highlight the roles of key ingredients example: Curcumin from turmeric and vitamin C from Amalaki, known for their robust antioxidant properties; withanolides in Ashwagandha and nimbin in Neem, which exhibit remarkable anti-inflammatory effects; and the collagen-enhancing tinosporine in Guduchi, along with chebulinic acid from Haritaki that supports skin elasticity.

Our formulation process was meticulously designed, focusing on herb selection criteria that emphasized free radical scavenging capacity, bioavailability, and safety. The resulting stable kahwa potli offers a novel approach to beauty care. We conducted a randomized, double-blind clinical trial involving 50 participants representing diverse skin and hair types. Over a 12-week period, participants received either the Ayurvedic supplement or a placebo, with assessments of skin hydration, elasticity, hair quality, and serum antioxidant levels conducted at regular intervals.

Results revealed significant enhancements in skin hydration, elasticity, and overall appearance, alongside marked improvements in hair strength and quality. Notably, serum antioxidant levels increased, correlating with a reduction in oxidative stress markers.

This research underscores the potential of a holistic Ayurveda-driven formulation that synergistically combines various herbs, offering a natural and scientifically validated alternative to conventional cosmetic products. The versatility of our formulation for both internal consumption and topical application presents exciting opportunities for personalized beauty solutions, advancing the integration of traditional wisdom in modern skincare practices. Our findings contribute to the growing discourse on sustainable beauty, positioning Ayurveda at the forefront of innovative skin and hair care solutions.

Sustainable Frankincense-Infused Lipstick: Harnessing Natural Ingredients for Enhanced Efficacy and Environmental Stewardship

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Abstract – This study presents the development of a sustainable, frankincense-infused lipstick that combines natural butters, waxes, and oils with the diverse benefits of luban (frankincense). Traditionally used in perfumes, oils, skincare products, and aromatherapy, luban is known for its anti-inflammatory, antimicrobial, and antioxidant properties. It also promotes hydration, improves skin elasticity, reduces signs of ageing, and supports relaxation through its soothing aroma. Leveraging these properties, this research aims to create a healthier, multifunctional lipstick that enhances lip health while aligning with eco-conscious principles.

Formulations with different concentrations of luban extract and varying wax-to-oil ratios were prepared, mixed, and moulded into lipsticks. These were evaluated for physicochemical properties, including texture, colour stability, and melting point, as well as sensory attributes like aroma, appearance, and user satisfaction. Statistical analysis identified the optimal combination of ingredients, resulting in a creamy lipstick with high pigmentation, a shiny brownish colour, and a calming fragrance.

This innovative product offers both aesthetic and therapeutic benefits, making it suitable for daily use. By incorporating natural ingredients and emphasizing sustainability, the study highlights the potential of luban to create eco-conscious cosmetic products that prioritize health, beauty, and environmental responsibility. The findings demonstrate the versatility of luban in creating products that merge functionality with ethical beauty practices, paving the way for more natural, high-quality formulations in the cosmetics industry.

Sustainable Urban Planning Practice through Town Planning Scheme Approach: A Case Study of Surat, Gujarat, India

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Abstract **–** Sustainable urban design and development are able to handle a number of complicated concerns, including resource depletion, rapid urbanization, and climate change. This research project explores the ideas and practices of sustainable urban planning, with a focus on the connection between town planning schemes and sustainable development practices. The study highlights how the compact city concept and diverse land use, which promote effective land usage and vibrant, connected communities, may be supported by effective town planning. It accomplishes this by emphasizing how social, economic, and environmental elements are intertwined.

The main focus is a case study of the Surat Municipal Corporation's (SMC) town planning program, which operates within a total area of 462.149 km². Within this area, the core city spans 8.18 km² and exhibits an organic growth pattern, while the remaining 453.969 km² is designated for planned development through town planning (TP) schemes. SMC has prepared a total of 142 TP schemes, of which 69 are final TP schemes, 20 are preliminary TP schemes, 47 are draft TP schemes, and 6 draft TP schemes have been submitted to the government. In parallel, the Surat Urban Development Authority (SUDA) has developed a total of 20 TP schemes, including 15 sanctioned draft TP schemes, 1 preliminary TP scheme, and 4 draft TP schemes submitted to the government. This case study illustrates how strategic planning may improve urban sustainability and resilience.

The research highlights imaginative strategies that enhance sustainability, such as mixed-use development, green infrastructure, and community involvement, by thoroughly analysing this case study. Furthermore, the function of technical developments and governmental frameworks in supporting these sustainable behaviours is investigated. The results underscore the importance of stakeholder participation and cooperative governance in achieving long-term sustainability objectives. In the end, this essay promotes a paradigm change in urban design that emphasizes social justice, ecological integrity, and economic feasibility. It also offers a roadmap for cities looking to strike a balance between sustainability and growth in the twenty-first century. By coordinating town planning schemes, like those carried out by SMC and SUDA, with sustainable urban practices, cities may build resilient ecosystems that satisfy the demands of present and future generations.

Keywords **–** Sustainable Urban Planning, Town Planning Scheme, Mixed Land Use Development

Systematic Study of Text Correction for Highly Utilizable Languages in India

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Abstract – Spell checkers and grammatical checkers play a significant role in the performance of word processors, search engines, and social networking platforms. They are linguistic applications that check text for errors in grammar and spelling and alert the user to any unintentional typos. However, research on text correction lacks comprehensive exploration of strengths, limitations, handled mistakes, performance, and assessment factors in this field. There are text correction applications available for multiple languages, accessible in literature. While these applications share some traits, they differ in design. This work utilizes systematic literature review methodology, focusing on spell-checking. Through this methodology, 110 publications from prestigious journals, conferences, and workshops in text correction for various languages were selected and analysed. The study encompasses processes such as formulating research questions, selecting research articles, defining inclusion and exclusion criteria, and extracting relevant data from chosen research articles. The literature on text correction is segmented into sub-areas based on languages, with each sub-area detailed according to the employed approach. The study analyses several papers based on specific criteria to derive results. It suggests that approaches from various fields, such as structure, chunking, hash tables, part of speech, and stemming, can be applied to construct spell-checkers.

Keywords – Spell checkers, Grammar checkers, Word processors, Non-word errors, Real-word errors, Stemming, POS (part of speech) RNN (Recurrent neural network), Edit-distance, Dictionary lookup, Text correction.

The Right to Access Public Spaces in Kolkata: Explaining the City-Community Dynamics and Sustain-abilities

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Abstract – 'The character of a city is defined by its streets and public spaces...public space frames city image' (UN HABITAT). This is precisely because a public space when adequately produced and properly maintained enables the city to ensure sustainable societies and markets. It leads to the production and re-production of that space where democracy, sustainability, justice and citizenship find true grounding; for public spaces are places both 'publicly owned or of public use, accessible and enjoyable by all for free and without profit motive...Public spaces must be seen as multifunctional areas for social interaction, economic exchange and cultural expression...Public space enables the population to remain engaged and to stake a claim on the city. This implies to respect and protect a number of rights and freedoms' (UN HABITAT). However, it is time the academia took note of what has public spaces actually come to mean, especially in cities of developing economies, where large scale 'first-world-looking-heterotopias' are increasingly becoming realities. A social intersectional survey in the city of Kolkata, India including a sample size of 350 individuals, found that the right to access public spaces in the city vary in the sense that the rights to access 'privatised public spaces' like malls and multiplexes are exercised more by the urban rich as compared to the urban poor and thus the later have relatively more access to the non privatised public spaces like local parks and fairs. Interplay of identities therefore acts both as a cause and as an effect so far as the right to public spaces are concerned, for there exists denials of two kinds – identity induced denial and denial induced denial. The two in turn are closely associated.

Keywords – Public spaces, Right to the City, Denials, Kolkata

Urban Design Strategies for Climate Mitigation: Pathways to Sustainable Futures in India

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Abstract – This paper examines the role of urban design strategies in climate change mitigation within the Indian context, focusing on implementable solutions for sustainable urban development. Through analysis of current practices and emerging technologies, the study identifies key interventions in green infrastructure, sustainable transportation, energy-efficient building design, and urban heat island mitigation. Drawing from both successful case studies and quantitative data from major Indian metropolitan areas, this research presents a comprehensive framework for climate-responsive urban design. The findings indicate that integrated approaches combining traditional knowledge with modern sustainable technologies can significantly reduce urban carbon footprint while improving livability. The paper concludes with policy recommendations and implementation strategies for different urban scales, emphasizing the importance of context-specific solutions in Indian cities.

Keywords – Urban design, Climate mitigation, Sustainable development, Green infrastructure. Urban heat island effect, India, Smart cities, Environmental planning

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