ANNUAL RESEARCH ON CITIES SUMMIT 7.0

INTERNATIONAL CONFERENCE

SUSTAINABLE URBANISM IN THE GLOBAL SOUTH

Book of Abstracts

School of Human Settlements
XIM University

Book of Abstracts, Annual Research on Cities Summit (ARCS) 7.0
International Conference on Sustainable Urbanism in the Global South
School of Human Settlements, XIM University, Bhubaneswar
10 - 11 February, 2023

MESSAGE FROM THE VICE-CHANCELLOR'S DESK

Dr. Fr. Anthony Uvary
S.J Vice Chancellor and Professor
XIM University

On behalf of XIM University, I extend a warm welcome to all the delegates who have come from around the world to participate in the ARCS 7.0 the Seventh Annual Research on Cities Summit.

The theme of this year's summit, "Sustainable Urbanism in the Global South" could not be more timely or relevant.

As the world's population continues to urbanize at an unprecedented rate, it is crucial that we invest in education and research in the field of urban management, governance, and planning. By working together, we can develop new and innovative solutions to the complex challenges facing our cities, from climate change and inequality to the need for affordable housing, access to clean water, sanitation, and sustainable transportation.

XIM University's identity is distinguished by its philosophy of 'Inspiring Futures' by not just walking the well-trodden path but striking out and exploring new paths. In order to address various developmental challenges confronting our cities and regions, the School of Human Settlements at XIM University has pioneered innovative courses in the areas of Urban Management, Urban governance, and Planning. By providing students with a comprehensive education in these areas, we equip them with the knowledge and skills necessary to address complex challenges and create sustainable, liveable cities for all.

I believe that the insights and knowledge shared at this summit will be invaluable in helping us to create more sustainable, humane, and just cities for all. I urge you to engage in robust and productive discussions and to make the most of the opportunity to connect with your peers and colleagues from around the world.

Once again, welcome to XIM University, and I look forward to a successful summit.

FOREWORD

Prof. Dr. Kajri Misra
Dean, School of Human Settlements
XIM University

The Annual Research on Cities (ARCS) Conferences was started by the Xavier Center for Urban Management and Governance (XUMG) in 2017, as a national platform for regular knowledge sharing and live discussion about urban planning and management across professional, academic, policy, and development spheres. It also marked the launch of a new professional field in India with the MBA-Urban Management and Governance Programme, based on the conviction that sustainable urban development required a range of professional expertise in addition to Planning. With the inception of the School of Human Settlements (SHS) at XIM University in 2019 and the inception of the Master's in Urban and Regional Planning Program in the School, the ARCS has diversified further across fields and dimensions of urban development.

A host of policy and programmatic initiatives have been set in motion in the last two decades to address urban issues in India. A variety of efforts, experiments, and innovations in urban planning, management, and development are also being implemented across cities by state, civil society, and private-sector actors. However, there were limited opportunities or platforms for sharing these initiatives, and the experiences and impacts, across the stakeholders. This left valuable insights and learnings buried – and perhaps eventually lost, as they remain in individual and sometimes, organizational memories. An immense loss, for as the country rapidly urbanizes towards housing almost 30% of the global urban population in 2035, context-relevant knowledge and its appropriate application become critical to deal with problems and prepare for emerging ones like climate change impacts. In this context, the ARCS Conferences provide a learning opportunity for all and increase the extent of documentation and reflection on urban policy and interventions.
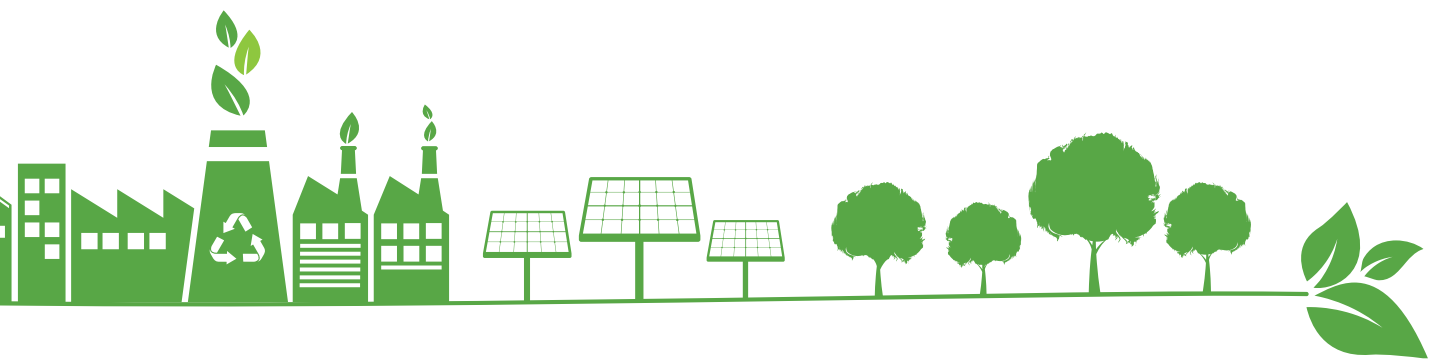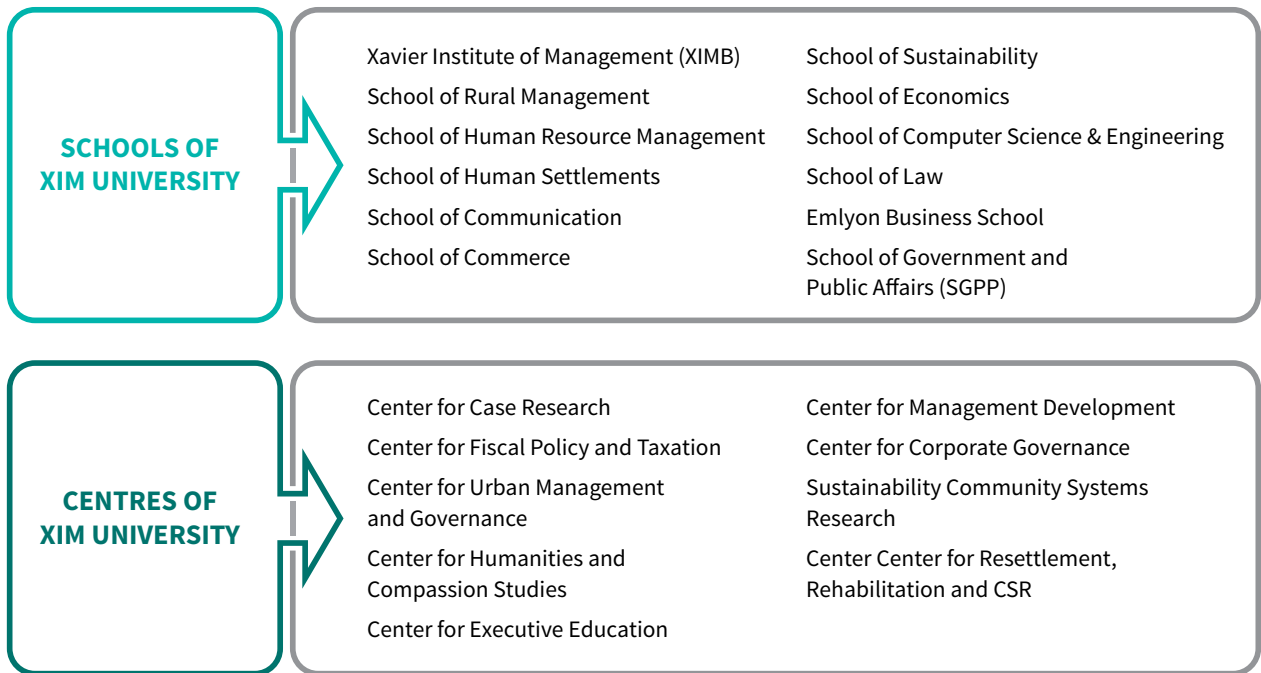
The ARCS Conferences continue to be a signal event in the domain for an annual sharing of academic, professional, and policy work across urban sectors and dimensions, though other fora have emerged in recent years. To encourage research, case study, and documentation of urban initiatives, the Annual Urban Research Awards (AURA) has been instituted for best papers, research theses, and cases. From the ARCS 2.0, the Conference has become international, with the participation of researchers and key speakers from other developing countries with similar concerns and issues. While multi-sectoral and multi-stakeholder knowledge sharing continues to be its hallmark format, every ARCS Conference focuses on a specific dimension of urban development.

This year the ARCS 7.0 draws attention to the unfolding of urban policy and practice in cities of the global South, in the face of international policy and knowledge transfers which often shape initiatives in these cities. With an increasing understanding of the differences across cities in the global North and the South, this is an important dimension for examination in all kinds of urban policy and interventions. Understanding how global articulations of urban strategies and approaches in various sectors play out in cities of the South or are adapted to suit local contexts is important not only to make policy and practice more relevant but also to build appropriate capabilities for sustainable, responsive, and inclusive urban development in developing countries.

XIM UNIVERSITY

XIM University, building on the long legacy of high-quality development and management education of the Xavier Institute of Management Bhubaneswar (XIMB), was established under the Xavier University Odisha Act, 2013. The XIM Board of Governors comprises representatives of the Jesuit Society, the Government of India, the Government of Odisha, and eminent industrialists and educationists. Distinguished by its philosophy of 'Inspiring Futures' – of students, organizations, and communities – by enabling them to explore beyond well-trodden paths and serve as an active agents of change in society, XIM carries forward the hallmark education for the creation of social value provided by XIMB. The University has also carried forward and strengthened the three decades of knowledge support provided to government, business, and national and international organizations to design and implement business, social, and economic development initiatives. This is extended through consulting and advisory services for local, state, and national governments, businesses, and civil society entities, and high-quality management research towards the overall urban, rural, and industrial development of the state and the country.

SCHOOLS OF XIM UNIVERSITY

Xavier Institute of Management (XIMB)	School of Sustainability
School of Rural Management	School of Economics
School of Human Resource Management	School of Computer Science & Engineering
School of Human Settlements	School of Law
School of Communication	Emlyon Business School
School of Commerce	School of Government and Public Affairs (SGPP)

CENTRES OF XIM UNIVERSITY

Center for Case Research	Center for Management Development
Center for Fiscal Policy and Taxation	Center for Corporate Governance
Center for Urban Management and Governance	Sustainability Community Systems Research
Center for Humanities and Compassion Studies	Center Center for Resettlement, Rehabilitation and CSR
Center for Executive Education	

SCHOOL OF HUMAN SETTLEMENTS

The School of Human Settlements (SHS), houses the human settlements and public systems management and development initiatives of XIM University. SHS's mission is to create the expertise needed for balanced and sustainable urban, rural, and regional planning and development. Building on the extensive and long experience of rural management education, research, and consulting at XIMB, the School of Human Settlements extends the efforts to develop the professional expertise, knowledge bases, and development policy advisory services required for human settlements at all scales – urban, rural, regional. It additionally incorporates the understanding of spatiality, spatial transformations, and public systems in its programs. Currently, the School of Human Settlements offers two 2-year full-time master's Programs and Doctoral programs in two domains, as listed below. In addition, it offers executive education and capacity building in public systems for economic development, education, health, water and waste, affordable housing, mobility, habitat resilience, and other aspects crucial for sustainable development. Graduates work with Consultants, Government, SPVS, and industry.

PROGRAMS OFFERED AT SHS

MBA-UMG
MBA- Urban Management and Governance - started from 2016

MURP
Master's in urban and Regional Planning - started from 2020

B.PLAN
Bachelors in Planning - starts from AY 2023-24

PH.D
Ph.D – Urban Management and Governance Ph.D - Planning

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ANNUAL RESEARCH ON CITIES SUMMIT (ARCS)

The ARCS is an annual Conference organized by the School of Human Settlements, XIM University, to share research and experience on the planning and management of human settlements and urbanization in India. Current understandings of the conditions of cities, towns, and peripheries and their functioning and development processes are minimal and partial, presenting a key challenge for effective intervention. ARCS aims to stimulate the creation and facilitate the exchange of knowledge to develop safe, sustainable, and just settlements.

ANNUAL URBAN RESEARCH AWARDS (AURA)

The Annual Urban Research Award (AURA) is presented at the ARCS annually for the best paper presentation. Submissions are invited at the time of the Conference announcement every year from academics, researchers, students, professionals, and policymakers. ARCS 7.0 AURA awards are classified into the best paper presentation and the best thesis award. The papers are selected based on the - Overall delivery of the presentation, research content, Communication Skills, and Time Management.

ARCS 7.0: SUSTAINABLE URBANISM IN THE GLOBAL SOUTH

The planet's sustainability hinges on making our cities sustainable, and though it is only one of the 17 SDGs, almost two-thirds of the total 169 targets of all 17 SDGs need to be addressed in urban areas. Equally evident is that the cities of the global South carry a large part of this burden – for urban growth in the South is faster than in the global North, and 90% of the world population growth in the next two decades is expected to be in the global South. About 30 of the 40 megacities in the world are in the South, and so are most of those which are expected to become megacities in the next decade. Greening southern urbanism thus constitutes the most crucial sustainability challenge.

Policy, strategies, and technologies for green transitions in developing contexts are often transferred from the north by epistemic communities, consultants, and development organizations. However, there is little understanding of the variety of experiences when these are applied in southern contexts. Strategies in the global discourse - such as compact development, public transport, renewable energy, circular economies, transit-oriented development, blue-green planning, and green infrastructure, among others - do not map neatly onto southern urbanism due to the distinctively different characteristics. Many factors constrain cities in developing contexts. Priorities such as poverty alleviation, housing and basic services provision, inadequate finances, governance capacities, poor infrastructure, low technological development, and weak or absent urban planning and regulation displace or reshape the transplanted sustainability strategies and initiatives. Alongside, local perspectives, practices, and values inevitably configure different understandings and visions of sustainability. The concept, urgency, and systemic imperatives for sustainability are recast in these.

What are the various strategies and initiatives being applied in cities of the South? How are global discourses and experiences adapted, reshaped, or reinvented in the application context? What are the effects or sustainability outcomes? What are the unique challenges, and how are they met? What indigenous initiatives and innovations have emerged? Have traditional sustainability practices of the local contexts re-emerged and shaped urban sustainability in the South? More insights on these questions are required to identify effective paths to sustainable urbanism in the South.

The School of Human Settlements (SHS), XIM University, therefore organized the International Conference on Sustainable Urbanism in the Global South from 10th to 11th February 2023 to foreground work on these questions. Papers, cases and presentations were invited from academics, researchers, professionals, policy analysts and students, for sharing research and experiences in sustainable urban development planning and management in developing countries. The Conference also features the Annual Urban Research Awards (AURA) for the best paper and student thesis.

Presentations from different perspectives and sectors were organized in ten tracks:

Track-1: SDGs and cities of the global South

Track-2: Sustainable settlements planning

Track-3: Climate change and disaster risk reduction

Track-4: Sustainable urban regeneration through placemaking

Track-5: Sustainable Transportation

Track-6: Gender-sensitive and age-friendly cities

Track-7: Digital solutions for sustainable cities

Track-8: Sustainable Health, Water, and Sanitation

Track-9: Circular Economy of the global South

Track-10: Affordable housing and well-being

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- Students of Masters in Urban and Regional Planning (2021-23 & 2022-24)

CONTENTS

TRACK-1: SDGS AND CITIES OF THE GLOBAL SOUTH

What innovative planning and development approaches have been adopted for sustainability? How are cities working towards SDG goals? How have financial constraints due to the Covid-19 pandemic and global economic slowdown impacted SDG targets?

SPATIAL DECISION SUPPORT SYSTEM FOR ENHANCED LAND USE PLANNING THROUGH LAND DEGRADATION NEUTRALITY: A CASE STUDY OF KASARAGOD, KERALA

Aarabhi Nambiar[1], Mohammed Firoz C[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Most cities of the developed world have difficulties with the availability of land, which is the foundation for its development. Unplanned settlements and urban growth cause forced land degradation, urban sprawl, and ecological fragmentation. Hence Sustainable land management (SLM) is crucial to minimizing land degradation, rehabilitating degraded areas, and ensuring the optimal use of land resources for the benefit of present and future generations (FAO).

The current study attempts to craft an integrated framework that assesses the study area's degradation status. It also tries to put forward the concept of a planning support system, which will be the key database for the interdisciplinary individuals related to the domain and the commoner. A systematic methodology is used to identify and assess the relevant variables in evaluating the study area's hotspots and land degradation status. The framework puts forward a 3tier assessment, and the current study intends to be a first-tier assessment at a regional level. The study also includes recommendations tailored to the area and explores a framework for a planning assistance system that can be used in comparable scenarios.

The study also examines a framework for a planning support system that may be applied in a similar context. A regional scale of analysis is tried (Tier 1 Assessment), relying mostly on secondary data sources and remote sensing. The data set needed for spatiotemporal data was produced using satellite data from Landsat 4-5 TM & Landsat 8 (spatial resolution 100 m resampled to 30 m) from Earth Explorer, a geo-platform of the U.S. Geological Survey, for the years 1990, 1998, 2006, 2014 and 2022. Other secondary information comes from dependable international and national data sources (Eg: Census of India, India Meteorological Department, Soil Grid 250 m. District Urbanization Reports, etc.).

The analysis is conducted by taking Kasaragod district, Kerala, which has the state's highest percentage of degraded area, as a case study. The district is gradually urbanizing, and agricultural plantation is still a significant land use. It is also one of the districts with the highest surface runoff. The study, therefore, aims to understand the various planning issue of the district through the concept of land degradation neutrality assessment. To improve land use planning and predict potential future scenarios of land degradation, urban planners and other stakeholders need access to an integrated framework. Due to the complexity of the planning process, people become mere spectators, and participatory decision-making is not achieved. Hence, the study attempted to develop a 'Decision Making Planning Support System' (DMPSS) to help the planners enhance and improve the existing land use planning process while creating data transparency for the commoners to ensure citizen participation in city development. The DMPSS may find its use not just in the Kasargod district but also in many other urbanizing contexts with similar issues.

Keywords: Decision Support System, Land use Planning, Land Degradation Neutrality, Sustainable land management

LITERARY ASSETS AS AN ENGINE FOR CITY DEVELOPMENT AND GROWTH - REBRANDING KOZHIKODE AS A UNESCO CREATIVE CITY OF LITERATURE

Athira Ashokan[1], Bharath Reddy[1], Lavanya KP[1], Promiti Mallik[1], Mohammed Firoz C[1], Shyni Anilkumar[1], Susan Cyriac[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Within the last few years, cities around the world have promoted creativity as a new resource for driving future development. As a result, a number of networks have emerged around this theme. The UNESCO Creative Cities Network (UCCN) is one such network that attempts to use creativity as a mechanism to achieve sustainable growth and development. Out of the several themes, Literature is considered as an appropriate theme for the city of Kozhikode based on its rich literary heritage. Therefore, this research explores the city's potential in terms of its literature legacy, amenities, institutions, events, festivals, people, and many more.

Thus, the study aims to develop Kozhikode as a city that connects its people, and culture through its rich literary heritage- celebrating diversity, nurturing innovation and creativity, and a focus on strengthening the economy using literary assets.

Accordingly, a systematic study of the context and its uniqueness has been incorporated in the creative city-based development approach. The study is based on the primary and secondary data collected from various departments concerning the literature theme. Further, it will focus on answering queries of how a city can build on its creativity and develop an economy out of it? How can a city's heritage be preserved and enhanced by community involvement? How can a city use culture and creativity as resources for sustainable development, etc.

The study is divided into four sections. The first section explores the importance of revamping the literary culture of Kozhikode as a vibrant literary community. The second section assesses the accessibility and inclusivity of literature. Accordingly, an in-depth analysis of the city's literary aspects has been conducted to nurture innovation and creativity, focusing on strengthening the economy. This is followed by establishing a creative base in literature for the economy of Kozhikode to flourish. The fourth and final section discusses the policy, governance, and marketing aspects to strengthen the proposals.

The research put forwards a conceptual framework for making cities work better using non-conventional resources for developments like literature base to enhance urban development. It also envisages a creative, innovative regional development concept that can probably be replicated in other cities of potential and concern.

Keywords: Regional Planning, City of Literature, UNESCO Creative city network, City Planning, and Branding

CULTURAL ASSETS AS A WEALTH FOR CITY DEVELOPMENT: INNOVATIVE STRATEGIES FOR THE DEVELOPMENT OF KOZHIKODE CITY REGION, KERALA, INDIA

Ayushi Singh[1], Ansila Mehaboob[1], Brajesh Verma[1], T.S.Athira[1], Mohammed Firoz C[1], Shyni Anilkumar[1], Susan Cyriac[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Regional planning has traditionally focused on maximizing the utilization of resources within a region to ensure that the population has access to necessary infrastructure and services. This planning approach with the concept of regional development usually deals with developing sectors like settlement patterns, economy, and environment. Infrastructure, tourism, disaster management, land use, etc. Through this kind of development, are we looking into retaining the region's cultural value? In recent years, there has been a shift towards a more holistic approach to regional planning, with a focus on innovative solutions. UNESCO's Creative Cities Network and the United Nations' Sustainable Development Goals both recognize the importance of culture in achieving sustainable cities. Innovative city planning methods, such as incorporating public art, cultural districts, and sustainable design elements, can revitalize areas and enhance livability while preserving cultural heritage.

Kozhikode is a medium size city in Kerala, India, with diverse cultural assets. The City's rich cultural legacy and harmonious fusion of art, religion, and philosophy have a lot of untapped potential. Accordingly, a thematic approach is proposed to make Kozhikode a City of Culture. So, in this research, we are focusing on re-imagining and enhancing the cultural value and assets of the region rather than following the conventional mode of city development. Kozhikode city has a long history dating back to the 14th century. It was a major trading port and played a crucial role in the spice trade. Today, the city is known for its cultural diversity and vibrant arts scene. The city is home to a number of cultural festivals and events, including the annual International Film Festival of Kerala, which attracts filmmakers and movie lovers from around the world. Additionally, Kozhikode is home to several museums, galleries, and other cultural institutions, making it a destination for those interested in the arts and culture of southern India.

The present research aims to establish Kozhikode as a center of culture and brand it as a global cultural platform. The research, therefore, included a study on both tangible and intangible elements of culture, using both primary and secondary data sources to gather information on Kozhikode's cultural assets. The study also identified major clusters and linked cultural assets through economic linkages. Finally, the research proposed a theme-based branding strategy to raise the city's profile and make recommendations for promoting social and economic growth in the city's cultural sector. This marketing strategy is expected to rebrand Kozhikode as a city based on its cultural assets as an innovative development strategy. These efforts are expected to help Kozhikode establish as a globally recognized cultural destination ultimately.

Keywords: Regional Planning, UNESCO Creative city network, Cultural Assets, Rebranding of cities, Theme-based Regional Planning, Tangible and Intangible heritage.

PARAMETERS OF EVALUATION OF SUSTAINABLE CITY DESIGN

Rosi Sarkar[1], Dr. Shivashish Bose[2]
[1]School of architecture, Techno India University, West Bengal
[2]Jadavpur University, Kolkata

Planners and scholars from all over the world have been sitting over the design of an ideal city since the early 19th Century (after the effects of the industrial revolution), and laid out a number of parameters for the same. Sustainability is the need of this hour. A city of the 21st Century needs to be sustainable in the long run in order to qualify the 'ideal' benchmark.

From Vitruvious to Lewis Mumford, from Thomas Moore to the Government of India, all have proposed the ideal city design parameters since the beginning of city planning in the 18th Century. Whether in the name of 'ideal city,' 'utopian city,' 'smart city,' or 'green city,' all are looking towards designing a city which is as functional in the present and as sustainable in the future. The biggest challenge is to balance sustainable development with an ever-growing population of the city and the ever-changing need of the citizens in turn, as the Earth has finite resources to take the pressure of development. The debate on a sustainable ideal city has reached new horizons in today's world and shifted from theoretical perspectives toward practical application.

Are there any parameters through which an existing city can be accessed or evaluated on its sustainability factor? Do those parameters affect citizens' happiness quotient or quality of living? This paper tries to find that out.

This paper tries to outline the parameters of a sustainable city design from different sources of literature, scholars, and theories; and summarizes into a set of parameters on which an assessment of a city can be done. Taking the example of Kolkata City and its existing conditions through secondary data sources, an evaluation has been done on the parameters of a sustainable city design.

Keywords: Kolkata, sustainable city, parameters of evaluation, assessment

HEALTHY CITIES IMPLEMENTATION IN DELHI: THROUGH LOCALIZING SDGS

Shubham Goel

The way we plan and build our cities defines our quality of life. It affects not only the quality of our living spaces and transport, but also the air we breathe, the water we drink, and our access to nutritious food, education, health care services, and employment.

Cities play a critical role in implementing the Sustainable Development Goals (SDGs) and the New Urban Agenda. The SDGs provide an operational framework for thinking about urbanization worldwide while also giving local channels for action and paying close attention to eliminating disparities in the distribution of health benefits. While SDG 3 expressly addresses health and well-being, it is also a prerequisite for SDG 11, which aspires for inclusive, safe, resilient, and sustainable cities.

The Healthy Cities initiative was conceived to elevate health on the social and political agendas of cities by promoting health, equity, and sustainable development via innovation and cross-sectoral transformation. It was founded on an understanding of the need of action at the local, urban level, as well as the critical role of local governments.

Healthy Cities and local governments have gained new attention and significant prominence in the context of the implementation of Sustainable Development Goals (SDGs) and health promotion agendas. The focus on building healthy communities has grown significantly in the last few decades. Building healthy urban communities is one of the most important challenges countries worldwide face. Rapid Urbanization has placed unbalanced pressure on budgets and the reach of city government when it comes to delivering healthy, successful environments. None of our Indian cities feature among the Top 50 cities in many global rankings.

There is growing evidence that new approaches to planning are required to address the challenges faced by contemporary communities. These approaches need to be based on timely access to local information and collaborative planning processes.

COVID-19 revealed the dire need for planning and management of our cities, with an emphasis on the health of citizens. It has become imperative to develop innovative approaches, frameworks, and methods to support health planning. Thus, to address these identified gaps in the knowledge, this study aims to develop a conceptual planning framework for creating healthy communities

Specifically, the study aims to prepare action plan to promote Healthy City program in Delhi by localizing related Sustainable Development Goals. By Identifying the key elements and domains of information that are needed to develop a healthy city program in consonance with related SDGs.

Keywords: Healthy cities, Delhi, SDGs, COVID-19

REBRANDING THE CITIES AS AN INNOVATIVE REGIONAL DEVELOPMENT MODEL BASED ON CREATIVE CITY CONCEPT - A CASE OF KOZHIKODE AS A CITY OF GASTRONOMY

Varun Prasad[1], Shabnam Khan[1], Jyoti Srivastava[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Cities are crucial to any developing nation's sustainable growth. Due to industrialization and globalization, urban planning techniques must contend with previously unheard levels of complexity and density in urban development. However, in many aspects, the development of urbanization and globalization offers a great opportunity that causes overcoming conventional conditions of regional planning with creative concepts. Therefore, when we talk about creativity, we are referring to a new approach that is stated regarding the structural features of the city and region and is mostly manifested through economic and cultural activities. Major urban centers participate in networks and associations (like Creative Cities Network), which encourage positive energies and promote excellence in cultural diversity, successful partnership models, and positive effects on the economy. It also advances human-centered value, sustainable urban development, the growth of culture and creativity, and Cities are crucial to any developing nation's sustainable growth. Due to industrialization and globalization, urban planning techniques must contend with previously unheard levels of complexity and density in urban development. However, in many aspects, the development of urbanization and globalization offers a great opportunity that causes overcoming conventional conditions of regional planning with creative concepts. Therefore, when we talk about creativity, we are referring to a new approach that is stated regarding the structural features of the city and region and is mostly manifested through economic and cultural activities. Major urban centers participate in networks and associations (like Creative Cities Network), which encourage positive energies and promote excellence in cultural diversity, successful partnership models, and positive effects on the economy. It also advances human-centered value, sustainable urban development, the growth of culture and creativity, and the 2030 Agenda of UN sustainable Development Goals. These networks and associations also support creative businesses and the sustainable

development of urban areas. UNESCO has started to promote creative and cultural industries in cities through the creative city network programs at the heart of their development plan since 2004.

Kozhikode is a coastal city in the southern part of the Indian state of Kerala. It is in this city where Portuguese navigator Vasco da Gama landed in 1498 and was a key center for the spice trade. The city has a rich and diverse food culture, which includes Arabian, Portuguese, Yemenis, French, and English, as well as traditional food like Mapilla, Kokanai, Gujarati, etc. But, the food industry has not yet been developed up to its potential and was never a focus under local development plans. So, there is a need to reposition it as a food city. Hence, the aim of the research is to brand the city of Kozhikode as a creative economic model of the gastronomic city with activities and creative public spaces like food streets, hubs, tours, trails, and other infrastructure (Waste Management, Streets, etc.).

The study is divided into four sections. In order to gain a deep insight into how other cities are redeveloped based on the theme of Food/ Gastronomy, cities like Cordoba, Shunde, Bergen, and Hyderabad are studied in the first section. By taking inspiration from such studies, the second section does a series of primary surveys, focus group discussions, and assessments with all the stakeholders, namely food Outlets owners, food bloggers, consumers, informal food outlets sectors, etc. The entire food matrix of the city with respect to operational timing, variety of cuisines served etc. is analyzed for different food clusters identified through surveys. Gap assessment of food outlets is done with respect to different sectors like tourism, health, education, etc., to understand the availability and relation between them.

The third section proposes different strategies for gastronomy-based city development related to four themes i.e., Vibrant Gastronomy Community, Culinary Infrastructure, Gastronomic creativity, and education. City branding strategies are also proposed, like logos, slogans, websites, and monthly including various events and festivals in the fourth section. The study concludes by suggesting a framework based on which similar cities of India/ similar contexts can be developed based on the gastronomy theme for the overall improvement of the city.

Keywords: Creative City, Creative Economy, City of Gastronomy, City Branding

SUSTAINABLE DEVELOPMENT GOALS AND URBANIZATION IN NORTH-EAST INDIA

Yogesh Kumar[1], Moumita Dutta[1]
[1]Jawaharlal Nehru University, New Delhi

Sustainable Development Goals (SDGs) were decided at the 70th anniversary of the United Nations in New York in 2015. It aimed to set 17 goals that cover the important aspects of Sustainable development, where the 11th goal deals with inclusive, resilient, safe, and sustainable cities and human settlements. SDGs cover three important dimensions of sustainable development, which are economic, social, and environmental. It could be convenient for the global north to be close to achieving these goals with unrepresentative indicators. Like 11th goal has four indicators, of which three are related to development, whereas one is related to environmental impact. Good performance in development indicators may outweigh poor performance in environmental indicators, and the country could still have a good SDG score. However, the global south struggles to balance the economic and social aspects along with environmental sustainability as they have no place to offshore their environmental hazard. The global south also contains huge diversity in different continents.

Countries like India are internally very diverse, and they require localized plans to implement and execute the SDGs properly. The focus of the paper will be cities of North-East India which are unique in terms of ethnicity, language, culture, tradition, etc., from the rest of India and the world. India has localized its SDGs for its North-Eastern states and provided a separate North Eastern Region SDG index. Using this data, a comparative analysis has been done between the performance of urban areas of selected North-Eastern

states' districts and the average performance of the urban areas in India for the 11th goal of SDGs using the F-test and T-test. This analysis gives us the percentage of deviation of the districts of North Eastern states from the average of India. Regression analysis in the required and actual level of implementation in different parameters of SDG 11 has been performed, and a profound lack of implementation has been found. A star diagram with the required percentage values of the parameters of SDG 11 and the capacities of the selected districts of the North Eastern Region has been prepared to represent the capacity of North Eastern states in the implementation of the goal. All this exercise shows the position of North eastern states in implementing goal 11 of SDGs as compared to the average of India. But there are also issues of not incorporating the local concerns of this region in the SDGs. The North Eastern States are tribal-dominated and are conserved with different acts and schedules of the Indian constitution. It makes the Urbanization process much different in the region with unique traditional governance, the land tenure system, property rights, cultural practices, and means of livelihood, which may not seem compatible with the embedded assumptions of SDGs in other parts of the world. These issues have been discussed in the paper through which SDGs could be improved and made more inclusive and hence could be prevented from attaining the fate of Millennium Development Goals.

Keywords: Sustainable Development Goals, Millennium Development Goals, global south, urban governance

MORPHING DEMOGRAPHIC CHARACTERISTICS DRIVEN BY ALTERING WATER USE IN SOUTH BENGAL

Tazyeen Alam[1], Ankhi Banerjee[1]
[1]Indian Institute of Technology Kharagpur

The term "urbanization" refers to the process of mass migration from rural to urban environments and the resulting increase in the percentage of the population that resides in cities. In this century, more than 50% of the world's population lived in urban areas, making this a prominent worldwide trend. Many factors, including economic and social opportunities, improved infrastructure, and population growth, have driven urbanization. It has positive and negative effects on the environment, economy, and people's quality of life. For example, increased urbanization can lead to economic growth and improved infrastructure but also overcrowding and pollution of natural resources, especially water. The efficient use of urban water has several benefits, as it ensures cities have safe drinking water and reduces stress on local rivers and other water resources. Also, water management reduces waste, making our environment cleaner and more sustainable for future generations. There has been a significant gap in connecting these two parameters. Therefore, this study attempts to develop a relationship between the socioeconomic characteristics of the population and the changing water use in two pilot study areas in South Bengal, Budge Budge and Diamond Harbour Municipalities. It utilizes primary field data from household surveys and secondary data from the Census handbook. A relationship between the two constructs is derived using a measurement model and the influence of other latent variables. The findings of this study suggest a logistic relationship between the water source of the households and its impact on their affordability. These qualities determine society's quality of life by influencing employment, education, and healthcare. Understanding socioeconomic features ensure social policies that support urban growth. Thus, this study bridges the gap in the relationship between water use and the affordability of households in South Bengal, a highly urbanizing region of the global south and climatically vulnerable zone in India.

Keywords: Socioeconomic characteristics, Household affordability, Urbanization, Water Use

CHANDIGARH: THE ROLE OF URBAN PLANNING AND REGULATIONS TO ACHIEVE SUSTAINABLE GOALS

Sohan Lal Saharan[1], Dr. Manjari Chakraborty[1]
[1]Birla Institute of Technology - Mesra

Since the Brundtland Commission (WCED) report in 1987, sustainable cities have been the leading global paradigm of urban development discussions. Sustainable urban development is currently the top priority of cities in both developed and developing countries. Sustainable urbanization requires that cities should generate better income and job opportunities, provide the needed infrastructure for water and sanitation, energy and transportation and preserve their natural assets. The sustainable aspect of the cities is measured on the basis of achieving various sustainable goals as identified by the UNDP.

Development control is an aspect of planning in which the desire is to allow for an orderly environment that will meet the requirements of ideal living. Development control is seen as a mechanism put in place to maintain the living standard. Development control regulations are tools for guiding and promoting development in an area in order to improve the quality of life of its inhabitants, and thus, Codes and regulations are a means of achieving the goals of sustainable development. The quality and quantity of urban planning codes and regulations of each city directly reflect on its urban activities' quality and quantity

The literature on Chandigarh's planning, celebrated principally because of the central involvement of Le Corbusier, is largely architect-centric, descriptive, and positivist, with few critical evaluations. The majority of work approaches the city from a physical standpoint, and the discourse revolves around its designer, marginalizing its residents, political leaders, and socio-political and historical contexts. Sustainability as such is not talked about.

When Le-Corbusier planned Chandigarh in the 1950s, sustainability was not a widely known concept. The city plan was conceived as a post-war 'Garden City' wherein vertical and high-rise buildings were ruled out, keeping in view the people's socio economic-conditions and living habits. The city was planned as more ecologically sensitive, with all social and physical infrastructures in place.

The city is based on a four-fold concept that recognizes living, working, care of the body and spirit, and circulation as the basic functions of the city. Most of the sustainability parameters are based mostly on this idea of the Chandigarh plan. This paper argues that though no written intentions exist to achieve the sustainable goals because of inherent sustainability in the plan and further control mechanism, it is helping Chandigarh in making it one of the most not only planned but sustainable in the future. This paper is about how the urban controls and master plan contributed in the achievement of sustainable objectives.

Keywords: urban planning, Development control regulations, quality of life

TRACK-2: SUSTAINABLE SETTLEMENTS PLANNING

What are the dynamics of urban, peri-urban, and rural landscapes and their governance? Role of migration in shaping cities? What are the dynamics of the city region? What are the challenges in sustainable settlement planning and approaches? Exploring the rural-urban linkages and livelihood perspective.

LAND DEGRADATION TO SUSTAINABLE LAND MANAGEMENT: LAND USE POLICY ISSUES AND CHALLENGES, A CASE OF KERALA

Aarabhi Nambiar[1], Mohammed Firoz C[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Kerala has undergone significant demographic and economic profile changes in the past decades, which has resulted in rapid urbanization. High Population density in the urban centres has accelerated the conversion of agricultural land for other use. This could be the reason for the state's recurrent floods and other environmental issues. According to the Desertification and Land Degradation Atlas, 2021,10.87% of the state's total geographic area is experiencing desertification or land degradation during the years 2018 and 2019, with an increase of 1.10% from the years 2011- 2013. Hence sustainable land management (SLM) is essential for preventing land degradation, restoring damaged regions, and ensuring the best possible use of natural resources for both current and future generations.

To implement SLM practices, public policies are crucial. Although there are policies to prevent unsustainable land transitions, their implementation and monitoring are insufficient due to the growing demographic pressure. The top-down method of policymaking frequently serves the short-term interests of the community while producing unsustainable land usage at the micro level. Due to Kerala's radical and complex political history, various land regulations designed to govern and encourage agriculture have been put in place. These laws range from the Kerala Land Reforms Act of 1963 to the draft Kerala Land Use policy, which is yet to see the light. However, inadequate oversight, a poor execution plan, and political power-playing have reduced the reach and efficacy of these general policies. The different Land statutes and the loopholes that make SLM in the state more difficult are reviewed critically in the current study.

The study is a critical review of the various acts and policies related to land. The study focuses on the need for a comprehensive and integrated land use planning system with a customized approach.

Keywords: Land use Policy, Land Degradation, Sustainable Land Management

NAXALISM, EDUCATION, AND YOUTH - CASE OF BASTAR DISTRICT, CHHATTISGARH

Alok Kumar Pandey[1], Shikha Puri1, Dr. Uttam Kumar Roy[1]
Indian Institute of Technology, Roorkee

The world is split into three categories: developed, developing, and underdeveloped. Development is a multifaceted phenomenon, and India, as a developing country, faces its own internal obstacles in responding to it. Naxalism is one of these difficulties, which is present in 10 of the country's 28 states. The Naxal movement began to defend the oppressed and reduce inequalities. Despite the fact that the Naxal-affected parts of India are wealthy in natural resources, the people and youth of the region struggle to live a decent life.

All development and revolution movements seek a better future, and education plays a critical role in shaping the future since it directly impacts children, who are the future bearers of sustainable growth. The rapid quantitative expansion of educational opportunities is regarded as crucial to national development. Development advances more quickly the better educated a population is. "Quality Education" is 1 of the 17 Sustainable Development Goals (SDGs) of the United Nations (UN). It aims to ensure all with inclusive and equitable quality education as well as opportunities for lifelong learning. This signifies that quality education is the foundation for fostering sustainable growth.

In this paper, the impact of Naxalism on the Education of Bastar district, Chhattisgarh, has been determined. Bastar, a district in the Dandakaranya area, has been a hotbed of Maoist activity since the beginning of the People's War. K. Seetharamaiah, the founding father of the People's War (PW), conceived of the notion of establishing a guerilla zone in Dandakaranya. Bastar, in particular, quickly earned a major place on the Maoist road plan due to its typical geopolitical setting and socioeconomic state.

For the study, specific parameters related to the region's educational facilities were identified and analyzed. A people perception study has also been conducted to understand youths' understanding in relation to education facilities. According to the study, the blocks of districts that are Naxal-affected face the most problems in expanding education. Due to the conflict between the government and the Naxals, the tribal youth at the grass root level is getting critically affected.

Keywords: Development, Sustainability, Naxal, Education

ASSESSING THE HEALTHCARE SECTOR FOR SUSTAINABLE INCLUSIVE CITY DEVELOPMENT: A CASE STUDY OF KOZHIKODE, KERALA

Antara Sablok[1], Sanket Y Salunkhe[1], Mohammed Firoz C[1], Shyni AnilKumar[1], Susan Cyriac[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

A city is meant to serve its residing, visiting, and migrating population. The basic sectors of development and sustenance of a city have always been education, healthcare, transportation, construction, etc. These sectors not only support the liveability of the population but also are major forces in local economic development. Traditional regional planning has always focused on optimizing the resources within the region to ensure that the population is well served and taken care of in terms of the infrastructure and services being provided. This research explores the avenue of the healthcare sector in a city for its inclusiveness in service in terms of quality, quantity, and accessibility. It further explores harmonizing the resources to global perceptions and market expectations and develop, manage, and improve a city's image and reputation in the selected sector.

With the shift in the focus toward a non-conventional regional planning paradigm, the paper investigates thematic-based innovation planning in the Kozhikode city region with the healthcare sector as a pillar of development. The region's status as a hub center for healthcare is confirmed by the fact that the city is now served by more than 100 healthcare facilities. Its strong linkage with Middle East countries has already served as an excellent market for health tourism. Therefore, the region is home to several hospitals that provide their services to clients from all over the world at affordable rates. These facilities range in terms of services being provided from allopathy to homeopathy, ayurveda, and Kalari* as well in the sector it caters to ranging from Clinics, and Primary Health Centres to General and Super-specialty hospitals. Currently, the region has been serving not only its native population but also the floating population from nearby districts, other states as well as many Gulf countries.

The research concentrates on the healthcare infrastructure assessment of the area, in terms of quality and quantity. It would also address a few case studies of global cities being marketed in a similar sector at a global platform, giving way forward for the conduction of the research and also the interventions of sectoral improvement. The infrastructural inadequacies thus discovered were used as the foundation for the proposal and recommendations for the social and economic growth of the region.

Though the city has a vast inventory of healthcare facilities that exceed the anticipated needs, there are significant gaps that cause it to suffer in terms of quality, particularly in government services. The fullest potential can only be accomplished by catering to local and global consumers. This would also have an induced economic impact on the secondary and tertiary sectors, contributing to local economic prosperity.

With the proposals put forth, the branding strategy initiated, and stakeholders complying with the city's identification in the healthcare sector, the city can truly become a pioneer for a one-stop destination for all healthcare services. The research paper gives a methodological outline for conducting such research work in any city, providing a framework for the approach to be used, the necessary analysis, and the path ahead for city branding in a certain area or field. This activity provides an in-depth understanding of how a city's marketing plan would function.

Keywords: Inclusive Sustainable City Planning, City Branding and Marketing, Healthcare Accessibility in a city

SUSTAINABLE SETTLEMENT FOR MIGRANT CONSTRUCTION WORKERS IN INDIAN CITIES

Anurita Bhatnagar[1], Sharadbala Joshi[1], Dhaval Monani[1], Asima Sahu[1]
[1]Anant National University

Migration, movement from one place to another often triggered by various socio-economic factors, is one of the oldest behavioural phenomena in developing countries like India. Instead, the pursuit of more lucrative employment opportunities pushes people to move out of their comfort zones. Till date, most of the housing schemes, including PMAY are grounded in the place of one's origin and its availability is dependent on the domicile status. The migrant workers face acute shortages of suitable housing in their adopted cities due to a lack of relevant documentation and are often forced to live in sub-optimal conditions in different types of informal settlements and rendered homeless when adversity strikes.

The present paper delves deeper into the plight of migrant workers in the construction sector and endeavors to understand their socio-economic and housing scenario through a primary survey. This paper is based on research undertaken from September to December 2021 on 430 migrant construction workers in Mumbai, Navi Mumbai, Panvel, and Vasai in the State of Maharashtra, India. The respondents are either interstate or intra- state migrants belonging to the construction sector and were randomly selected from various informal settlements like slums and chawls of these cities. The study highlights the aspiration of migrants while looking for suitable accommodation and brings forth various day to day challenges they faced in their settlements. The study culminates with the identification of sustainable short-term and long term settlement options that adhere to basic safety standards could go a long way to make the transition for migrants easier as the demand for affordable housing is very inelastic by nature.

Keywords: Migration, Sustainable shelter, Construction workers

DELTA DESIGN FUTURES: URBAN DESIGN FOR NEW SETTLEMENTS IN PEARL RIVER DELTA REGION DRIVEN BY THE ECOLOGICAL PROCESSES OF THE ESTUARINE RIVER DELTA

Chetan Kulkarni
Sasaki Associates, Boston, USA

Despite a series of 'structure plans' to coordinate regional and urban developments since the 1980s, cities in the Pearl River Delta Region (PRD) of south China observed the uncoordinated and rapid transformation of agricultural land for industrial and urban developments. This urbanization and infrastructural development engineered the river delta into a successful export-oriented economic zone, but negatively impacted its hydrological and deltaic processes.

After the emergence of Shenzhen and other eastern PRD cities as major cities, cities that lie west of Pearl River Estuary are poised to develop significantly as innovation-based urban hubs. It is imperative these developments address hydrological concerns and geological changes, including storm surges due to sea-level rise, coastal erosion, and land subsidence in the river delta. The paper will summarise ideas of urban and ecological design for PRD cities, which will be relevant for all major coastal cities in the Global South. These planning and urban design ideas have been developed through a transdisciplinary method of analyzing delta elements along with the design of framework plans for urban growth in the Pearl River Delta. The presentation will feature the research and design content, including illustrations and photographs, part of the upcoming book "Delta Design Futures" by the author (ORO Editions, Spring 2023).

Keywords: urbanization, hydrological, deltaic, Pearl River Delta

MULTIFUNCTIONAL LANDUSE AS A PLANNING CONCEPT FOR NEIGHBOURHOODS TO INCREASE QUALITY OF LIFE: A REVIEW TO UNDERSTAND SOCIO-ECONOMIC BACKGROUND OF URBAN REALM: UNDERSTANDING SPATIAL AND TEMPORAL SYNTAX

Jyoti Meena[1], Preeti Chauhan[1]
[1]Indira Gandhi Delhi Technical University for Women

Rapid urbanization poses challenges for both expanding and emerging cities. Horizontal & vertical development leading to urban sprawl and increase in population density has many negative impacts such as excessive resource utilization and consumption, the additional load on infrastructure like water supply, drainage, etc., increased demand for commutation leading to road congestion and transportation malfunction, depletion in quality of life, noise and air pollution and social segregation. Through the management of land use and development, urban spatial planning helps to the development process. However, time and again, urban development policies focus more on developing monofunctional land uses, as they overlook and neglect the changing conditions of urban areas and needs of people. With limited resources and scarce land, it has become necessary to embrace new innovative approaches in urban planning and management. One of the approaches to resolve these issues could be re-evaluation of existing landuse in the city and redesigning of land for optimum utilization by the people. Secondly, to promote economic development and employment creation to help alleviate areas other than dense urbanized areas. Third, by creating self-sustainable urban colonies. This research paper focuses on a review of the re-evaluation and re-designing of urban spaces. The study explores the concept of multifunctional land use to optimize functional efficiency for better land utilization and to achieve greater vitality in urban areas. The re-design of existing land in the city with a view of multifunctional urban planning concept is a way to efficiently manage the land, which also has huge implications on the quality of life of the residents. At the outset first and foremost approach to conduct this research would be to review similar cases to understand multifunctionality and its various dimensions. The study will enlist the relevance of multifunctionality in today's planning concept.

Keywords: Multifunctional landuse, Quality of life, Neighbourhood

TYPOLOGICAL CLASSIFICATION OF RURAL-URBAN CONTINUUM SETTLEMENTS USING LANDSCAPE METRICS

Susan Cyriac[1], Mohammed Firoz C[1]
[1]National Institute of Technology, Calicut

Technological advancements, increased mobility, and unprecedented urbanization have formed new typologies of settlements that are vast in area. Such areas often need to be recognized owing to their extensive geographical coverage. While examining the planning theories, most focus on concentrated settlements and often fail to address such evolving settlement formations. Similarly, most countries follow a dichotomous – rural or urban classification- using definitions that date back at least half a century. In the evolving settlement formations such as megaregions, urban corridors, desakota settlements, and conurbations, the dichotomous classification and its application in governance, planning and management become obsolete. It is high time to recognize such regions and address the issues, and hence the research investigates one such region – Kerala in India, a rural-urban continuum (RUC) settlement, regarding its dichotomous classification and implications in spatial planning. The paper thus explores the issues related to spatial planning in Kerala and develops a typological classification approach for the rural-urban continuum settlements using landscape metrics derived from Sentinel, a remote sensing database.

Ernakulam district of Kerala, comprising 97 local bodies, which is the most urbanized, is selected as a case study. The district cuts across various topographic regions of Kerala and thus is a suitable example that addresses the rural-urban transects of the State. The local bodies of Ernakulam district are classified from Sentinel imagery of 10 m resolution using supervised maximum likelihood classification. The broad categories are built-up, vegetation, water, paddy & others. The classification had an overall accuracy of 89 percent, and FRAGSTATS was used to derive the spatial metrics. PCA was employed for dimension reduction, and the factor scores derived are used as inputs for further cluster analysis. The cluster analysis identifies five distinct clusters based on the built-up spread characteristics – aggregated, semi-aggregated, random, semi-dispersed, and dispersed. The typological classification is used to propose Rural Urban codes, and a spatial

planning framework is formulated to address issues in RUC settlements similar to that of Kerala.

Keywords: Landscape Metrics, Sentinel, Regional Planning, Cluster analysis, Typological classification

DEVELOPING SUSTAINABLE ALTERNATIVE LIVELIHOODS IN INDIGENOUS COMMUNITIES: A CASE STUDY OF ONUKUDELLI, ODISHA

Jyotirmaya Baral[1], Jublee Mazumdar[1], Arpan Paul[1]
[1]School of Human Settlements, XIM University

The Indigenous people & tribes population in India is around 8.6 percent of the total population. A sizeable amount of poor people tend to reside in forested areas. For households residing near forests major share of their income comes from forest & allied activities that lead to the degradation of forests. The Alternative livelihood approach will help in the reduction of forest-based activities, which would help them in increasing their income & decrease their dependency on forests. In the present study, Onukudelli town of Koraput, Odisha, has been considered for the application of an alternative livelihood plan. The case here is very peculiar as the residents do not own any land and all the land belongs to the Machkkund power plant authority, which is situated at a distance of 5 KM from the town. As people do not have any land security, livelihood opportunities are also very limited. People do not hold any freedom of farming or opening any institution for earning. The aim of this study is to formulate an alternative livelihood plan for the economic upliftment of the indigenous people of Onukudelli. The methodology of the study is divided into three stages; the first stage involves detailed literature studies to understand the concepts & approaches of alternative livelihood. The literature studies were followed by case studies in the context of the study area. In the second stage of data collection Household survey, Reconnaissance survey & Focus group discussions were carried out to understand the socio-economic conditions, existing livelihood status & economic potential of the study area. The third & final stage involves the proposals based on the economic potential of the study area. The proposals would help in enhancing the livelihood of the residents of the study area as well as the economic development of the whole region.

Keywords: alternative livelihoods, indigenous communities, economy

URBAN VOID TO URBAN CATALYST': UNLOCKING THE POTENTIAL OF PUBLIC LANDS IN PIMPARI-CHINCHWAD

Harshad Raisoni1, K.L. Tungnung[1], Arati Petkar[2]
[1]Amity University, Rajasthan
[2]Department of Civil Engineering, COE, Pune

The rapid infrastructure revolution is restructuring the morphology of India significantly in today's time. The transformational impacts are percolated up to the grass-root level, especially up to the urban local bodies (ULB). Though the 74th Amendment to the constitution has empowered the ULBs to function efficiently & independently, however, the resources to implement several infrastructure projects are getting narrowed down. Most of the revenue generated and funds gained are exhausted on the current expenditure resulting in shrinking the capital expenditure essentially needed for the city's robust infrastructure development.

Consequently, the ULB needs to rely more and more on State or Central Govt. funds or external grants, which affects its autonomy, delaying the expected outcome within a suitable timeframe. Hence the ULB needs to find alternative means of resource generation for the investment on its key infrastructure projects.

This research aims to introspect the 'Land as a Resource' model by considering the urban void in the public reservation lands within the city of Pimpari Chinchwad in Maharashtra state as an experimental case. Methodologically, such unutilized and underutilized land parcels have been identified, categorized and valued on the basis of Area Statement Rates (ASR) and Market Rates (MR). Considering the saleability and leasability of the land, the research puts up the proposition that monetizing the aforementioned assets can significantly contribute to the investments in urban infrastructure and other high-priority ULB goals.

Conclusively, the research intends to thrust on the merits of optimum utilization these 'Urban Voids' which can substantially benefit the ULB with the multi-layered approach in decision-making process, turning such lands into 'Urban Catalysts'.

Keywords: Urban voids; Urban Catalysts; Land monetization, public lands, infrastructure

TRACK-3: CLIMATE CHANGE AND DISASTER RISK REDUCTION

How can we make climate-resilient cities? What are the approaches, policies, and innovative planning to reduce the impact of climate change? What are the challenges and solutions in making cities resilient to disaster? How can the differential impact of climate change and disaster be addressed?
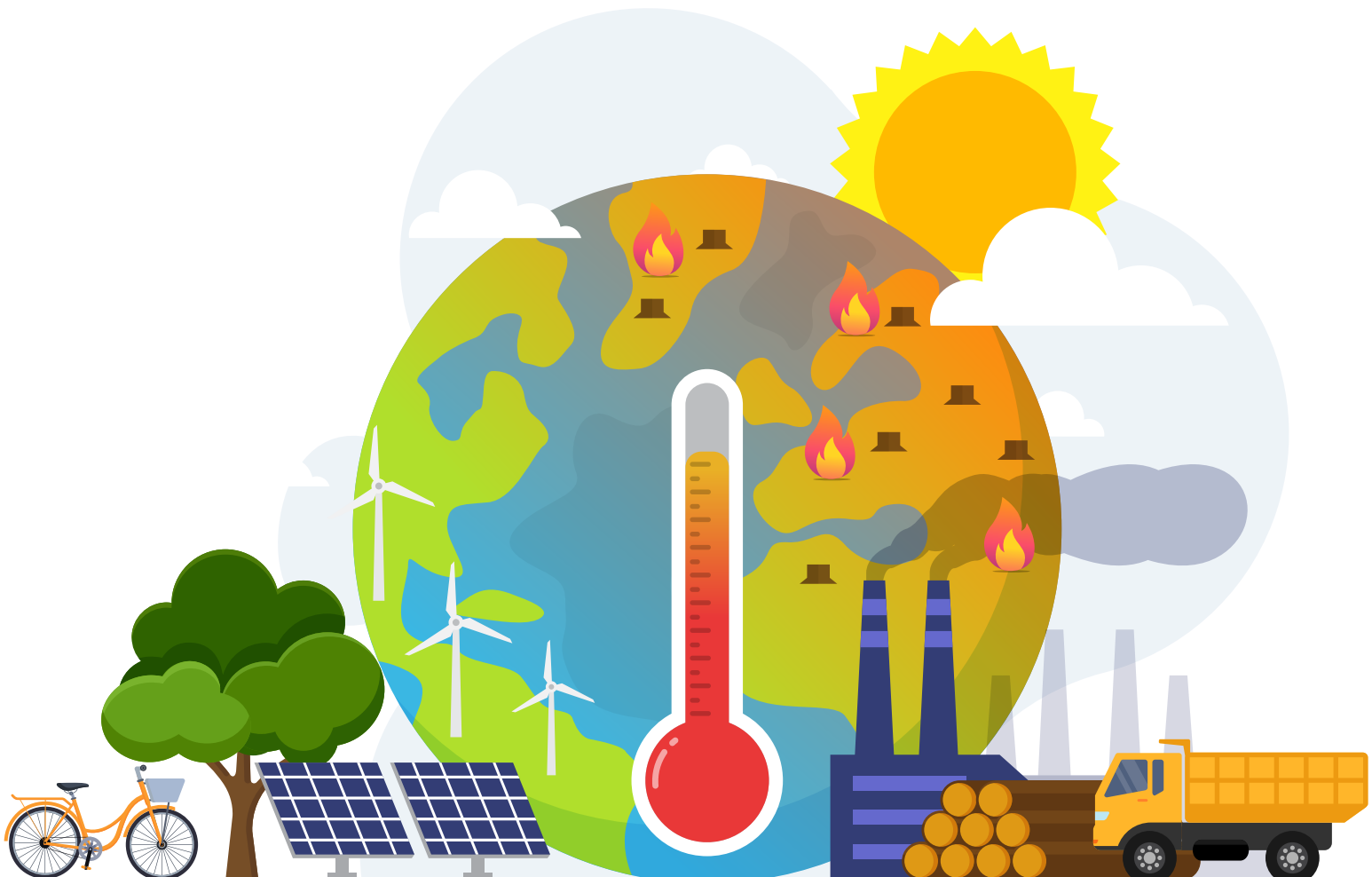
ANALYZING THE IMPACT OF LAND USE AND LAND COVER CHANGES ON LAND SURFACE TEMPERATURE- CASE STUDY OF URBAN HEAT ISLAND IN BHUBANESWAR, ODISHA

Ahana Samantaray[1], Jublee Mazumdar[1]
[1]School of Human Settlements, XIM University

The relationship between the urban environment and the effects of climate change is reciprocal; both the urban environment and the effects contribute to speeding the impacts. Cities are both the main causes of and most sensitive to the effects of climate change. Goal 13 of the sustainable development goal calls for urgent action to combat climate change and its impacts. In this study, remote sensing technology and numerical simulation methods have been adapted to analyze the impact of climate change in the context of UHI on Bhubaneswar city, offering guidance for enhancing the urban ecological environment and achieving sustainable urban development. Various methods such as the land surface temperature, the NDVI and the change in land use and land cover is analyzed to understand the extent of impact. Urbanization on the other hand accelerates the process of climate change with the reduction of green cover to increase the built-up area to provide for the infrastructure demands such as habitation, industries, transportation etc. The rise in land surface temperature brought on by the UHI effect will impact the health of citizens, urban climates, urban hydrologic conditions, soil properties, atmospheric environment, biological habits, material cycles, energy metabolism. Various methods such as the land surface temperature, the NDVI and the change in land use and land cover is analyzed to understand the extent of impact. The study focuses on the change in land use / land cover (LU/LC) on urban land surface temperature (LST) from 2002-2022 to understand the extent of impact and identify the hotspots for UHI in the context of Bhubaneswar city. UHI effects could be greatly reduced by increasing energy efficiency, optimizing urban landscapes, building green roofs, using high reflectivity materials, and cultivating green land in these identified hotspots and city inclusive recommendations to minimise and mitigate the impact of UHI. Urban areas are severely affected by heat stress as a result of the phenomena of urban heat islands (UHI). Since the spatial characteristics of a city influence its climate, urban planning can be used to reduce the combined effects of UHIs and climate change. This study analyses the various impacts and causes of UHI by assessing the land use, land cover, and land surface temperature to identify different hotspots in the city of Bhubaneswar where green solutions can be used to lessen the effects of climate change in the context of UHI.

Keywords: land use, land cover, urban heat islands, land surface temperature

URBAN CLIMATE DISASTER RESILIENCE: FOCUS ON GREEN INFRASTRUCTURE IN BHUBANESWAR, AN INDIAN SMART CITY

Amit Bhattacharya
Bhubaneswar Urban Knowledge Centre PgMC by Arcadis-IBI Group India

The ever-growing susceptibility of cities and peri-urban areas in India due to climate change impacts are getting acknowledged by the authorities presently. Unplanned developments, dependence on grey infrastructure depleting the ecosystem services pushing both the community and natural resources at potential risk of degeneration. Thus, building urban resilience is one of the major actions to analysing the current climate risks. Furthermore, interpreting future climate risk projections demand for long term practical policy making and strategy decisions to resist climate change effects and adapt with the altering environment.

Bhubaneswar, the first Indian city to win Pierre Lenfant International Planning excellence award 2017 for its smart city planning process has exhibited methods of integrating the grey and green infrastructures for necessary urban development. However, with the mounting urbanization demand the urban green and eco-sensitive zones are facing the pressure of encroachment or land conversion. This is resulting in shrinkage, confinement and/ or isolation from city's visibility, accessibility turning their fate into neglected underutilized spaces. Moreover, these urban phenomena often induce unavoidable climate risks such as urban flash floods, weak resistance to cyclonic storms owing to loss of physical and environmental assets. To resist this and delay the climate disaster risks further a holistic strategy has been devised by the Bhubaneswar development

authority incorporating the essential expertise from Bhubaneswar Urban Knowledge Centre (PgMC by Arcadis-IBI group India) to protect and preserve its urban green and blue resources. It includes the management and operations of natural components e.g., incidental green open spaces, urban forest, wetlands etc. and man-made elements e.g. parks, street trees, green roofs, renewable energy and waste management systems. The strategy plan identifies the ecosystem service values such as urban heat island reduction, microclimate cooling, pollution reduction, biodiversity enrichment for overall resilience development. More the integrated framework and values of resilience bring equivalent readiness to encounter and endure with climate related disasters.

The open space preservation strategy targets to strengthen the environmental, physical, social, economic and institutional framework of the city to develop and sustain climate preparedness. It also imbibes measurable action plans to be implemented by 2041 (the timeline for next masterplan for Bhubaneswar) such as developing accessible green spaces, floodable green area in the parks and large open spaces, restoring urban wetlands for sponge action, creating tree canopy continuity over major commuting networks etc. These key measures would reinforce the city's stewardship with natural assets. Also the action plan confirms the assessment of the existing parks and open spaces, waterbodies and storm water drainage networks, potential for introducing new green spaces, renewal of derelict eco-sensitive spaces, participation from the end users and stakeholders for ensuring its long-term sustainability. Streamlining funding process, project initiation and information availability, post implementation sustenance by the citizens and developing wholesome awareness for authorities and public are major role players in this city-wide resilience building strategy. It is expected that the preservation strategy shall facilitate more scientific and evidence-based planning tool to understand, analyse and recognize multidisciplinary urban catalysts. This would boost the climate action from grassroot level and support future climate disaster risk resilience.

Keywords: green infrastructure, urban ecosystem, nature-based solution, ecosystem-based adaptation, sustainable O&M and funding

ASSESSING THE IMPACT OF RAINFALL VARIABILITY OVER THE COASTAL SMART CITIES OF INDIA

Joydeep Ballav[1], Dr. Sourav Mandal[1]
CSIR - National Institute of Oceanography, Goa

The recent floods in the several cities around the world had petrified the common people and baffled the city planners and administrators due to erratic intense rainfall. The changing climatic patterns associated with fluctuating rainfall have put cities into severe flooding situation. It has become essential to understand the trends, variability, of rainfall pattern by the city planners and policy-makers. In recent past, several researchers reported that climate changes occur due to warming of the ocean system and atmosphere, and consequences in changes in rainfall pattern and hydrological utmost and leads to increasing floods and droughts worldwide (IPCC 2007).

In the present work, the long-term rainfall variability in 11 coastal smart cities of India is investigated. The Hilbert–Huang transform (HHT) based CEEMDN method is used to decompose the long term annual rainfall series into several time series (namely intrinsic mode functions (IMF)) based on their periodic oscillation. For the annual rainfall series of Panaji, a marginal decrease in trend is observed after a certain highest peak around year ~1970. Although, south west monsoon (SWM) and north east monsoon (NEM) show an overall increasing trend, in recent years, a decrease in NEM precipitation can be observed for Panaji. The study also reveals a monotonically decreasing Annual and NEM rainfall trend at Thane, while an overall increasing trend is observed for NEM rainfall in Chennai.

The hydro climate risks associated with the coastal flooding and ground water recharge are two significant priority of smart-city planners. The periodic structure of annual rainfall is compared with several large-scale global climate indices in the present work. High correlation is observed between the monthly mean rainfall and global climate indices for lager period of oscillation. The results revels that global climate indices related

Sunspot Number (SN) and the Indian Ocean Dipole (IOD) are major influencer of rainfall trend. However, the influence of climatic indices is susceptible to regional differences, which lead to the necessity of such an analysis at finer spatial resolution. The present study will help the urban planners, managers, decision and policy makers to understand the spatial and temporal variation of seasonal rainfall for effective planning and flood management at coastal smart cities.

Keywords: Rainfall variability, Coastal smart cities, HHT, Hydro-climatic risks, Smart cities of India

AFFIRMING AN INCLUSIVE APPROACH TO DISASTER RISK REDUCTION

Kanika Bansal[1], Abhisikha Das[1], Monica Thakur[1]
[1]National Institute of Urban Affairs

India is among the world's most disaster-prone countries, with 27 of its 29 states and seven union territories exposed to recurrent natural hazards such as cyclones, earthquakes, landslides, floods and droughts. Due to the high rate of unplanned and haphazard urbanization, most metropolitan cities, including Delhi, Bangalore, Mumbai and Chennai have been witnessing urban floods within a short duration of rain. The latest report (2021) by UNDRR Climate change and increasingly extreme weather events has caused a surge in natural disasters over the past 50 years. Climate change has also increased extreme sea level events associated with some tropical cyclones, which have increased the intensity of other extreme events such as flooding and associated impacts.

Disasters have both direct and indirect impacts on Persons with disabilities (PwDs), thereby safeguarding and including PwDs in climate change resilience is a humanitarian responsibility. The new report of UNHRC calls to uphold the rights of people with disabilities when developing climate policies and to secure their meaningful, informed, and effective participation during the process. This indicates that strategies to map and devise actions for disaster management need to be inclusive in the true sense. Accounting for marginalized groups, especially persons with disabilities, advances the commitment to inclusive planning and development. The Rights-based approach, the most commonly advocated approach, is central to effective and equitable interventions and implementation of climate change policy, addressing the unequal level of economic, social, environmental and human development created by the many different challenges posed by adaptation to climate change. This would require a right-based and participatory approach at each level and each phase of both policy and disaster management cycles from the marginalized, especially persons with disabilities.

There is a pressing need to devise an inclusive approach towards Disaster Risk Reduction, planning, and strategizing for persons with Disabilities along with marginalized groups to ensure their needs are reasonably accommodated in disaster management. While the solutions exist at all levels of the disaster management cycle, from preparedness to adaptation to recovery phases, the report prepared by the National Institute of Urban Affairs on 'Developing an Inclusive Approach to Disaster Risk Reduction-Including Persons with disabilities in creating more resilient cities' propose a seven-step approach for holistic inclusion of persons with disabilities in the disaster management and emergency response systems. The paper aims to present the findings of the report and elaborate on the seven-step approach, particularly highlighting the significance of the evidence and citizen engagement in the process..

Keywords: Climate change, disaster, urbanization, natural hazards

NATURE-BASED SOLUTIONS TO BUILD CLIMATE-RESILIENT CITIES: A COMPARISON STUDY ON GLOBAL NORTH AND GLOBAL SOUTH

Stella Monica Topno
School of Rural Management, XIM University

Globally, urbanization and climate challenges pose a severe threat to the human population. Uncontrolled industrialization, unplanned infrastructure development, unregulated drilling, deforestation, and other challenges are associated with rapid urban growth. As the climate crisis intensifies, disaster events such as urban flooding, extreme heat, storms, and cyclones are occurring and causing property loss and life loss. Thus, it affects the well-being of communities and their livelihoods and consequently degrades the quality of life. As a solution to these challenges and pressures, nature-based solutions may be an option. The literature review reveals that nature-based solutions are those that use natural processes and structures to meet social and socio-ecological challenges while simultaneously providing economic, social, and environmental benefits, making it an appropriate solution to address these challenges in cities. Nature-based solutions are an umbrella term covering a range of ecosystem-based approaches to tackle different societal, environmental and economic challenges. In this literature study, an attempt has been made to understand the concept of nature-based solutions (NBS) and the need for NBS under the context of urban development. It also explores the concept of climate resilience and the link between NBS and climate resilience. The study also compares the use of nature-based solutions in building climate-resilient cities in the Global North versus the Global South. The study, with such insights, may able to fill the knowledge gap, and build an understanding of the feasibility of these solutions as well as the scope of future research.

Keywords: Nature-based solutions, climate-resilient, global north, global south

PLANNING FOR FLOOD EMERGENCY RESPONSE SYSTEM - AN INTEGRATED FRAMEWORK

T.S.Athira[1], Dr.Shyni Anilkumar[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

The exposure to frequent floods along with the multi-dimensional vulnerability regions, has aggravated the flood risks in the urban regions. A timely response to the flood emergency is therefore critical to minimizing loss of life. The implementation of a series of pre-planned activities during floods to lessen the threat to people, property, and infrastructure is known as a flood emergency response.

The aim of the study is to develop an appropriate framework for planning response actions during the flood emergency. The objectives of the study are 1) to critically appraise the emergency response methods & mechanisms essential for effective flood response and 2) to examine the standards and guidelines for emergency response planning advocated by responsible national as well as global agencies

A qualitative content analysis of pertinent literature serves as the basis for the entire study. Analyzing the flood response method proposed by the Australian Emergency Management Handbook is the first step in the research. Then, the study discussed the critical response actions and activities put forward by various organizations, such as the Federal Emergency Management Agency (FEMA), the International Federation of Red Cross and Red Crescent Societies (IFRC), the World Meteorological Organization (WMO), and the National Disaster Management Plan (NDMP). The best practices and systems for the response have also been comprehended from the standard operating procedures recommended by various agencies globally and nationally such as National disaster management guidelines, urban flooding standard operating procedure, Kerala state minimum standard for relief, National guidelines on temporary shelters for disaster-affected families, etc.

Five phases make up the flood response process. The decision to evacuate is the first step in the process after the hazard has been triggered. The next phase is a warning, in which information is disseminated to the general public to raise awareness of flood hazards and help people identify vulnerable areas. The following phase is withdrawal or evacuation in which people are displaced temporarily to a safer location which will be the shelter. Finally, during the return phase, people are transferred back to their homes.

A thorough disaster management plan that orchestrates a well-developed decision-making framework that correctly aligns multiple incidents and site-level response activities leads to a successful response. The final outcome of the study will be a theoretical framework outlining various actions and activities which should be carried out as a flood emergency response. The purpose of the framework is to consolidate the pertinent response stages along with the multitude of actions under varying flood hazard situations. This integrated framework would aid the response agencies at the local level in adopting appropriate decisions to implement emergency response measures during flooding.

Keywords: Flood Response Planning, Flood Response Actions, Standard Operating Procedure, Integrated Flood Response Action Framework

PERFORMANCE OF SATELLITE PRECIPITATION PRODUCT OVER COASTAL SMART CITIES OF INDIA

Yuvaraj S[1], Dr. Sourav Mandal[1]
[1]CSIR - National Institute of Oceanography, Goa

Tropical cyclone (TC) induced precipitation frequently causes severe coastal flooding. In recent times, climate change has triggered TC-induced rainfall intensity and posed a greater risk to the socioeconomic development of coastal cities. Since coastal cities are one of the major contributors of Indian economy, it is important to assess the risk factors and map their spatial variations. Rain gauges, radars, and satellites are widely adopted for monitoring rainfall. Due to high installation cost and significant maintenance of Rain gauges, use of satellite precipitation product (SPP) is increased since last two decades for monitoring rainfall.

Understanding the importance of precipitation, 11 coastal smart cities in Indian subcontinent are selected in the present study. The performance evaluation of six popular SPPs namely GPM (IMERG), TRMM 3B42 V7, CHIRPS-2.0, PERSIANN, PERSIANN-CCS, ERA-5 are carried out to aid, selection of satellite rainfall products for ungauged locations over those cities for better urban flood and ground water recharge related planning and management during cyclonic period. These multi-satellite rainfall products are validated with IMD's daily precipitation gridded dataset (0.25deg x 0.25deg) from rain gauge stations (2001-2020) over the study area for the TC-induced rainfall. The Validation of multi-satellite rainfall products with IMD is carried out using a combination of statistical techniques, including detection indices and error metrics during cyclonic periods. The rainfall data is analysed to quantify the TC- induced rainfall a particular period.

From the long-term TC trend analysis, it is found that the frequency of cyclone formation over North Indian Ocean has gradually increased in the last few decades. On average, there were 4.35 TCs per year generated over coastal cities of India. The maximum TC activity and extreme cyclonic rainfall are observed mostly during May, October, November, and December month. The result reveals that the cyclones formed in Bay of Bengal, provide an excess amount of precipitation over eastern coastal cities, which receive around 30 % annual TC-induced precipitation. The correlation between TC-induced rainfall and cyclone intensity is also studied.

Additionally, a comparison is carried out between the TC-induced rainfall obtained from the IMD and the satellite precipitation products. The assessment results demonstrated that CHIRPS-2.0 and ERA – 5 products achieved the highest performance in the eastern coastal cities, whereas GPM outperformed western coastal cities. Moreover, GPM tends to overestimate rainfall amounts during the cyclonic period. On the other hand, PERSIANN-CCS showed overestimated precipitation in east coastal cities and underestimated in western coastal cities. The present study will help the urban planners, managers, decision and policy makers to choose the right satellite precipitation product for effective planning and flood management at particular coastal smart cities.

Keywords: Tropical Cyclone induced rainfall, Coastal smart cities, satellite precipitation product, Vulnerability

TRACK-4: SUSTAINABLE URBAN REGENERATION THROUGH PLACEMAKING

How to create public spaces considering beauty, quality, accessibility, connectivity, and resilience for sustainable urban regeneration? How is place making changes over identity, culture, and geography? How to address the challenge of inclusivity in sustainable urban regeneration through place-making? Gentrification and conflict between formal and informal placemaking.

ANCIENT TEMPLES AS PLACEMAKING SITES

Amruta Ponkshe
Connect the dots urban

The current narrative of urbanization in India often centres on urban settlements created after the 1800s. This paper is an attempt to draw attention to the fact that Indian cities existed much earlier, as evidenced by existing historical narratives and supported by recent archaeological findings.

This paper considers the temple as a core unit of ancient urban life and delves into the motives of temple construction beyond its religious use. It hypotheses that certain temples and temple complexes built in ancient (pre 10th century) India were essentially constructed in order to provide an impetus to the growth and development of that region as a social, cultural, economic and ultimately an urban centre.

To bring seemingly disparate concepts of 'placemaking' and 'ancient temple construction' together, this paper will do the following:

Conduct a detailed analysis of contemporary (present day) concepts of placemaking through secondary data sources like research papers, books and international narratives and pick a few concepts for the purpose of this study.

Select 5 temples or temple complexes constructed before 10th century CE where the temples are in existence even today. These will become case studies to analyse the temples and surrounding areas for the concepts of 'placemaking'.

Understand which concepts of placemaking were used in temple construction and urban development from analysis of available historical data and current use.

Formulate key parameters of analysis for such a study to be replicated in the future.

Thus, this paper aims to create a checklist of parameters that will help understand ancient urban cities and concepts of placemaking at use in ancient Indian cities. The concepts highlighted through this research will be used to expand the narrative on urban India to pre-British cities and will ultimately become a part of an academic and practical work that understands urban design in ancient Indian cities from the point of view of contemporary concepts like placemaking.

Keywords: Placemaking, ancient cities, temple complex, urban India

WALL ART AND INSTALLATION AS PLACEMAKING TOOLS APPLIED TO INDIAN CITIES: EVIDENCE FROM ROURKELA

Deepanjan Saha
Department of Planning and Architecture, National Institute of Technology, Rourkela

Although characteristically identified as an act of vandalism and a marker of hip-hop culture, wall art or graffiti, as a form of public art and a tool for commentary, has received a growing public acceptance in Indian cities through the last decade. Besides being a public art form and a tool to reclaim public spaces, wall art has been promoted as a quick and potent tool to beautify city walls under govt. led flagship Smart City projects in several Indian cities. Such graffiti also acts like a platform to raise civic awareness and publicity around several govt.-led schemes. Additionally, the installation of imitated versions of the iconic 'I love …' signs at chosen vantage points in the city streets and public spaces has been quite a ubiquitous measure taken by the city administrators towards city branding. The addition of new façades to public buildings, like railway stations and municipal offices, has been quite another favorite. Although this city govt. led measures have been widely appreciated for adding an identity to the city and as a tool for urban regeneration, it has also received criticism considering these to be disproportionate allocation of city development funds and for putting up a misleading picture. This paper investigates the efficacy of the widespread application of these two artistic tools – wall art and installation – to quickly achieve the desired effects of placemaking and city branding in Indian cities. It presents evidence from the city of Rourkela while it undergoes a quick formulaic

makeover to co-host the Men's Hockey World Cup in January 2023. Based on a perception-based survey held among the residents, it assesses the level of public appreciation and criticism of these placemaking tools being applied to the steel city which otherwise lacks any signature visual character.

Keywords: City branding, placemaking, graffiti

URBAN FORESTS IN INDIA: EXPLORING POSSIBILITIES WITHIN THE SDG FRAMEWORK AND ASSESSING ITS ROLE IN SUSTAINABLE REGENERATIVE PLACE-MAKING

Falguni Tailor[1], Aashish Xaxa[1]
[1]Indian Institute of Technology Gandhinagar

There is a pressing need to bring back the shrinking green cover in urban areas which may help create a healthy living environment and aesthetically appealing cities and lead to sustainable, regenerative placemaking. Forests or large green spaces are generally located on the city fringes or farther from the city core. Green cover, having a crucial role in maintaining ecological balance, regulating temperature and rainfall patterns, improving air quality, and other important functions can be made an integral part of cities. Urban and peri-urban forests will address urbanization challenges, provide livelihood opportunities, improve the local and regional climate and enhance the quality of life. The article outlines ways to introduce and integrate green cover in urban areas, reviews cases from India and abroad, and explores policy and governance mechanisms for maintaining these green areas.

A preliminary literature review indicates that attempts have been made to bring in urban forest concepts and actions across the country and worldwide. Examples include rooftop gardens, sky gardens, vertical forests, urban horticulture, etc., introduced and practised by experts in this domain, including Stefano Boeri, Cristina Mazzucchelli, Patrick Blanc and others. The pilot scheme of the 'Nagar Van Yojana' of the Ministry of Environment, Forest and Climate Change, started in 2020 and aims to develop 400 'Nagar Van' and 200 'Nagar Vatika' across the country in the next five years, also illustrates the government's initiatives to enhance trees outside forests and green cover in cities. Moreover, leading international organisations such as the United Nations and World Bank have supported projects and conducted events in the domains of forests and terrestrial ecosystems; examples of which include Urban Forests for Future-Proof Cities by the United Nations Economic Commission for Europe, Forest Action Plan and Maharashtra Forestry Project by the World Bank.

Appropriate mechanisms to manage urban forests are required, considering the possible options, including citizen participation and community mobilisation. Suitable interventions and collaborative efforts can be undertaken by a broad range of stakeholders, including policymakers, non-government and community-based organisations, industries and private bodies, academicians and researchers to ensure harmony among policies, people and ecology. The idea of urban forests needs to permeate people's minds which may help promote better up keeping. Moreover, there is an urgent need for policy actions and modifications to institutional frameworks, for instance, incorporation of urban forests in future master plans, delineation of areas for urban forests, etc., to encourage urban forests.

Increasing urban forests will play a critical role in contributing to United Nations Sustainable Development Goals, especially SDGs 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and well-being), 5 (Gender Equality), 8 (Decent Work and Economic Growth), 11 (Sustainable Cities and Communities), 13 (Climate Action), 15 (Life on Land) and 17 (Partnerships for the Goals). Thus, urban forests will create a win-win situation from urban planning and sustainable development perspectives.

Keywords: Urban Forests, Sustainable Development Goals, Sustainable Regeneration, Governance

PLACEMAKING – COSMETIC OR CURATIVE

Jai Dighe
BUKC- Arcadis IBI Group

While balancing between conserving the cultural identity and adapting to the fast pace developing world, all the cities are tussling. Many of the urban areas have become monotonous with replicated urban frameworks. At one end the cities are losing its regional touch while redefining the identity, at the same time people are trying to recognize their space and niche public places in cities.

Planned cities based on master plan and national & international guidelines like URDPFI, NACTO etc have provision for developing public space. The spaces such as parks, sports complex, amusement parks etc that are provided by the government for citizens recreation. But in the due course the informal public places are overlooked like river or waterfronts 'ghats', religious space premises, khatti gathering corners, spaces around public water taps, wells, makeshift markets and many more.

Placemaking is all about identifying and reclaiming all such spaces for people and revesting them as per user choice. It acts as a pivotal tool to revamp these underutilized, neglected or even ill utilized spaces to better public spaces promoting inclusive, healthier lifestyle for urban regeneration.

The low hanging fruit and visible impact being creative Lighter Quicker Cheaper (LQC) approach of placemaking, it is adapted quickly, at times without being sensitive about the context. Hence, placemaking is seen as short duration cosmetic beautification as general perception.

Now is the time to move a step ahead with more cautious actions while learning on the job. There could be different approaches for placemaking depending on the regional influences, necessities, citizens' demand, culture, geoclimatic zones etc.

Standardized approach: Permanent type of approach with minimal, standardized but effective interventions focusing on accessibility, safety, legibility, hygiene, and quality of space.

Creative approach: It can be permanent or temporary with an intention to create or regenerate the identity of a space, creating the sense of pride and stewardship among the citizens.

Curative: Curative approach deals with a problem statement at hand such as improvement of traffic junctions or improving different assets for resiliency

One of the major criticisms on the placemaking is due to imposing of alien concepts, without considering the actual needs, aspirations, and roots of the local people. This has resulted in gentrification. A conscious strategy must be adopted with incremental developments to avoid such effects and destress in the citizens. Of all the stakeholders involved in the process one of the most important stakeholders, the citizens, should be given utmost importance for sustenance of the project.

At a nascent stage, the field of placemaking is being explored at various platforms. From the past experiences and learnings, it has become evident that to ensure sustainability, following aspects should be considered - balanced curative and cosmetic placemaking, formal recognition, defined funding mechanism, budgetary provisions for operation and maintenance, periodic assessment and regular upgradation etc. Some of the remarkable concrete steps through guidelines, toolkits and statutory provisions are Bhubaneswar Child Friendly Public Spaces Design Guidelines, Bhubaneswar Street Design Guidelines & Bhubaneswar Parks and Open Spaces Master Plan by BDA and Knowledge product for public spaces in India by GIZ and Arcadis IBI.

Keywords: Approach for placemaking, experimental field

RECLAIMING STREETS OF AN INNER URBAN CORE AREA WITH THE PLACE-MAKING APPROACH: CASE OF SURAT

Jinal Boricha[1], Satyaki Sarkar[1], Prashant Prasad[1]
[1]Department of Architecture and Planning, BIT Mesra

In the era of urbanization, Streets plays are vital role in economic activities, social hubs, and platforms for civic engagements. Streets hold the power to create memories. Streets reflect the diversity and vibrancy of the urban fabric. Among all public spaces, the Street emerges as the most important place for the public. Therefore, planning, designing, and managing better streets have become an important global discussion. Sustainable development goals and the new urban Agenda also emphasize safe, accessible, and quality public spaces for all. This may be achieved by understanding the existing street character and level of service provided to the citizens along with their perception and requirement to foster the how to make streets more vibrant by increasing activities, and safer through ensuring inflow of people and allowing people from different backgrounds to participate. For this purpose, the present work investigates to identify areas for intervention for the improvement of public spaces. For creating places and focusing on transforming the street as a public space and strengthening the connections between people and these places, the concept of Place-making is adopted. This will help to create a comprehensive design to reclaim the street as a public space and bridge the gap between people and place. The space syntax analysis technique will be used to assess the user's perception and to identify the areas for intervention. This article centers on the Indian city of Surat, Gujarat, which are moving towards rapid urbanization. The improvements will be made to promote the street as a public space. Thus aiding in providing proper infrastructure planning and fostering public spaces by prioritizing place-making to enable the connection of citizens with the place. Further, the prospects of the study's method can be adopted to help to understand the perceived needs of the citizens in various urban neighborhoods and also at the city level. The future scope of the study can hope to boost the existing street for the citizens.

Keywords: Street Reclamation, Place-making, Key parameters and Indicators, Analysis tools and techniques

URBAN FORM OF NATIVE INDIAN SETTLEMENTS THROUGH THE PARADIGM OF PLACEMAKING

Narinderjit Kaur[1], Uttam Kumar Roy[1]
[1]Indian Institute of Technology Roorkee, Roorkee

Centrality of activity either as religious core or civic core or dynastic core has been a key element in the urban form layout of ancient and native Indian settlements. At times, an urban settlement would be mono-centric or poly-centric. Further street network played another important morphological phenomenon in this urban layout. Indian ancient and native settlement history from Harappan Civilization to Mahajanapadas to invasive to colonial to contemporary planning practices were based on indigenous, integrated, and inclusive philosophy have now been superimposed with completely contrasting layers of colonial and western practices which is centred around zonal and sector segregation, gigantism, and alienation. Indian native practices also suffice SDG-11 which is 'Sustainable cities and communities' with focus on "Make cities and human settlements inclusive, safe, resilient and sustainable". The paper aims to elaborate the importance of Centrality of activity vis-à-vis placemaking in the planning of ancient Indian streets of historic precincts. It further analyses whether the concept of placemaking was inherent and integrated in the planning thought process of ancient Indian settlements or not. Methodology involves a comprehensive comparative analysis between urban forms of few of the Rajputana towns.

In placemaking each morphological, sociological, and behavioural element is an entity in itself and need to synergize with other elements to form a sustainable, effective, and holistic ecosystem for urban regeneration. Indigenous Indian urban forms were established on centrality of activities as a two-way interaction along the street lines, thus providing the safety and security of 'eyes on the street.' These street patterns were punctured with community activity spaces such as pols, katras, mohallas, chowks, bazaars, haats and ghats

which acted as mini congregation area and thus a sociological and behavioural determinant worked for the inhabitants. These suffice the targets of SDG-11 such as inclusive, safe, and sustainable cityscape.

The streets need to have active elements to work as impactful living veins, instead of dead infrastructure with the sole purpose of transporting people. In the current scenario, the elements of the streets are highly influenced by the western planning theories, which cause conflict with Indian way of living. For example; trips on the Indian streets are shorter, local, and based on walkability and non-motorized, thus sustainable. The concept of 'long-drive' is alien in India; rather 'short-walk' based on centrality of activity has been the 'mantra for classical designs of mohallas.'

Indian peninsula, being home to "the oldest continuously living civilization of the world," had already identified the various elements which were effectively incorporated into the urban form. The indigenous Indian street pattern was directional, and centrality based. The streets would act as processional ways, as community space, as haat's and bazaars which became the buzzing activity nodes and ribbons in the overall placemaking.

Study of such indigenous knowledge which are time-tested methods and true to the Indian spatial context of placemaking which can be a resilient way forward to urban regeneration.

Keywords: Urban form, Centrality, Street pattern, Ancient and native, Sustainable

A THEORETICAL INTERPRETATION OF CHANGE IN FACADES IN BUILT ENVIRONMENT WITH RESPECT TO THE SPATIAL CONFLICTS OF MYLAPORE, CHENNAI

Nived Narendran[1], N. Jothilakshmy[1]
[1]Saveetha College of Architecture and Design, SIMATS

Is India losing the identity of architecture to the western culture or is it losing its architectural character to the easy and boring architecture?

Did the introduction of glass, steel and other temporary materials into Indian architecture create a decline in the traditional architectural values and make it characterless or is it a reason to lose the identity of that place?

This paper is on the culture and ideals of Indian architecture focussing on the facades and its applications. Facades have been an identity for Indian architecture varying from regions, culture, people, communities etc. The amount of detail is missing throughout these days.

What is the architectural heritage or culture of India? India has centuries of evolved architectural heritage throughout the country, varying from Temple Architecture in the ancient periods to Mughal/Islamic Architecture during the reign of Mughal emperors and then to Indo Saracenic Architecture which was a revivalist architectural style during the British Era. There are more architectural styles that have come up from the amalgamation of several of these styles that are dominant to certain parts of India creating a unique identity to that specific place.

Indians have such great architectural heritage and cultures to boast about. Even though because of poor maintenance and lack of knowledge or skilled workers, these architectural marvels are going into ruins. There are no strong guidelines or rules to specify the need to conserve them.

Is it the government's fault or is it the negligence of the people who don't know the importance of architecture?

How did globalisation and urbanization affect the architecture in India?

How did Glass, Concrete, Steel etc. invade the architecture and construction industry?

In this paper, precinct study of Mylapore is done. Mylapore is a neighbourhood in the central part of the city of Chennai, India. Mylapore is a small neighbourhood with a number of temples and history. It has been evolving throughout the ages with respect to the rulers.

The study will be focussing on the kinesthetics of the place along with the evolution of the facades and its effects on the built environment.

There will also be an interpretative study on several façade treatments/ typology throughout the paper.

Eyes on the street by Jane Jacobs and Serial vision & Kinesthetics by Gorden Cullen are theories that can be used to interpret the study.

Keywords: Kinetic Facades, Vernacular Facades, Safety, Security, Built spaces, Space Syntax

PLACEMAKING APPROACH FOR SUSTAINABLE URBAN REGENERATION - A CASE OF THE YAMUNA RIVERFRONT

Razi Ahmad[1], Rizwan Kazmi[1]
[1]Department of Architecture and Planning, Birla Institute of Technology, Mesra

Evolution in human settlement has always been governed by several factors, ranging from food, trade, or other human necessities. But throughout this evolutionary process, the importance of Riverfronts as a perpetual ground for development has been undeniable. The role of these riverfronts has always varied with time. They have acted as fertile floodplains to the river valley civilizations and continued to do so until the Industrial Revolution, when they assumed new roles of dockyards, navigational and storage purposes.

But with time and rapid growth in population and urbanization trends of cities, development has prioritized the mainland and turned these edge zones into neglected sections of the city, fit for nothing more than waste dumping and encroachment. Due to this urbanization in cities, infrastructure development is generally aimed to provide accommodation to this ever – growing population, resulting in disregard to the inclusion of quality public spaces for the citizens. The neglected river edges can serve the purpose of a quality public space through the placemaking approach of urban design for sustainable urban regeneration.

The Yamuna Riverfront in Delhi is witnessing a similar degradation due to widespread misuse and neglect. Although each river edge has a different context and several layers of significance (historical, ecological, social, economic & cultural) are attached to it, the development authorities have devised intervention proposals similar to the successful, but non-contextual model of the Sabarmati Riverfront Development to rejuvenate the abandoned Yamuna riverfront.

This paper aims to demonstrate the use of the "Placemaking" approach for urban regeneration by using the Yamuna Riverfront Development case. The methodology used for this research includes a qualitative content analysis of relevant literature to determine the urban riverfront development trends across the country and a physical survey and schedule-based interaction with the local stakeholders to understand their perception towards necessary interventions along the Yamuna riverfront.

The results show that through a close examination of contemporary riverfront development trends and local stakeholders' perceptions, a list of spaces can be generated which will not only re-develop the Yamuna riverfront but also re-vitalize its environmental, social, economic, and cultural relevance as a quality public space. A socially inclusive placemaking strategy can be used to re-generate the riverfront so that the local stakeholders can benefit from its development and turn an abandoned and neglected edge into a viable, sustainable, and socially relevant zone.

Keywords: Placemaking, Riverfront, Urban Regeneration

PLACE MAKING THROUGH WATER SENSITIVE URBAN DESIGN

S.Roshini[1], Shanmuga Priya G[1]
[1]Department of Architecture, School of Planning and Architecture, Vijayawada

Commercialization and urban sprawl have led to placeless landscapes, where there is a missing link between people and urban public spaces. This poses a significant threat to the well-being of people. Additionally, due to climate change and unsustainable water resource management there are water related issues such as flooding and water scarcity in urban areas. These two areas need to be considered together, rather than providing public open spaces and addressing water issues in the open spaces and cities later. Thus, there is a need for a comprehensive approach in establishing urban public open spaces, and public spaces need to be cooperatively reimagined and reinvented through place creation. Creative place making, the process of developing desirable places for people to live, work, play in order to foster a feeling of community and place. Urban regeneration, which can be achieved through place making, is a technique to resolve this issue. In order to address this issue, this research aims to develop an assessment model to evaluate various water sensitive urban design techniques and components, using tangible and intangible place making elements to provide an understanding of how intentionally designed water sensitive techniques can improve place making.

In order to achieve the aim, this paper, first, reviews the place making models and theories extracted from urban design literature as an approach to water sensitive urban design which is a strategy of urban regeneration. Water Sensitive Urban Design (WSUD) has emerged as an evolving field of practice contributing to sustainability and livability of cities. Next, based on the review of the models and theories of place making and WSUD, an assessment model is   developed, from the integration of reviewed literature. Using the developed model this paper further assesses selected traditional and modern water sensitive urban design case studies in greater detail. This assessment helps to identify how the selected cases have strengthened their sense of place for the community, and to find place making components that are missing in order to create active, pleasant, interesting, and positive urban spaces enriching the city's image. The findings provide an understanding of how the use of water sensitive urban design techniques as urban regenerative strategies helps in the creation of successful creative place making.

Keywords: Place making, water sensitive urban design, urban regeneration

ENHANCING SOCIAL COHESION AND SENSE OF PLACE THROUGH SUSTAINABLE URBAN REGENERATION OF HISTORIC URBAN PRECINCTS: THE KUTTICHIRA PRECINCT AS A CASE STUDY

Shahim Abdurahiman[1], Kasthurba A.K. [1]
[1]Department of Architecture and Planning, National Institute of Technology Calicut

Urban heritage is a community asset and sustainable public resource encompassed of socio-cultural values that indulge the community in a symbiotic relationship with the urban fabric, creating a distinct local identity. The authenticity of historic urban areas is often challenged with unplanned developments, seldom considering heritage values associated with the community. Rapid urbanization and socio-political reforms have led to the degradation of the historic urban precincts, thus altering the cultural fabric disrupting the character and identity of the place.

The paper aims to analyze and study the socio-cultural impact of a heritage-led urban regeneration project in a historic urban precinct through the case of Kuttichira precinct carried out in Kozhikode, Kerala.

A conceptual framework focusing on two social criterion constituting of four sub-criteria of qualitative socio-cultural characteristic was identified based on expert opinions and review of published literature. The identified criteria discusses on aspects such as social cohesion and sense of place. A qualitative assessment of the success of the revitalization project focusing was conducted through a semi-structured interview amongst the public domain in the historic urban area of Kuttichira. Descriptive and inferential statistics were used to analyze the data.

The study reveals higher appreciation in the overall development of the environs, maintaining the cultural character and integrity simultaneously solving social challenges and issues. The study also determines the importance of aspects such as place branding and place attachment which serves as potential drivers for a successful sustainable urban regeneration project. Other key aspects that showed potential for enhancing the sense of place and cohesion were project components that supported cultural diversity and community engagement.

The findings contribute to the practice of sustainable urban development in historic urban precincts that caters to the needs of the community and also assists in the policymaking. Further studies can focus on other case examples of a different cultural context leading to a scope for comparative analysis.

Keywords: urban regeneration; urban heritage; historic precincts; sustainable; place-making

IDENTIFICATION AND REGENERATION OF URBAN LOST SPACES: AN APPROACH TO SUSTAINABLE CITY FUTURES, CASE: CORE AREAS OF LUCKNOW CITY

Sumit Wadhera[1], Jagbir Singh[1], Subrajit Banerjee[1]
[1]Faculty of Architecture, Dr APJ Abdul Kalam Technical University, Lucknow

The human evolution has been a driving force of developments and innovations in the field of science, technology, education, development, resource utilization rather exploitation and simultaneously with advent of time and functional approach of humans, has raised concerns of high importance and threat across these segments affecting any country's / city's growth and development. As a result, the latest hot topic of deliberations: "Sustainability" came into force and became of immense importance to be addressed on high priority, primarily, with reference to the city's growth and planning approach which in turn addresses and affects each of the above stated sector and its dynamics along with direct impact on human evolution and existence. Along with the idea of sustainability in the utilization of resources, Land as a key resource has put the thought process focus towards the Sustainable City Planning concept, wherein, many facets of city planning raging concerns in its dynamics has comprised of city policies, planning principles and stakeholder perspectives that have resulted into impacts of crude and unregulated city growth, resource abuse, spatial imbalance in use and purpose. These issues prevalent across the country have been raising the concerns within architects and planners alike. With these concerns as a backdrop, the issue amongst the aforementioned that has been discussed in this paper relates to Land as a tangible resource, its unjust utilization, loss of potential use allocation, spatial abuse of land and its resultant loss over the period of time complimented by the approach and perpetual activity oriented mechanism of stakeholders. This abuse of a tangible and non-renewable resource by a segment of people and its appreciative cognizance by another generates an intriguing phenomenon of generative non usable yet potential spaces-"liminal spaces". The paper ponders over these spaces, their evolution and mindset of varied stakeholders towards their existence, reasons and utilitarian mechanism and also tries to identify the spaces which are lost or unutilized/under-utilized/ potentially wrongly placed/utilized and understand which spaces form part to this concept of lost urban spaces and how do they form part of urban human settlements justifying their loss as a huge loss for the spatial planning mechanism.

Keywords: Sustainable cities, open spaces, lost spaces, liminal spaces, interactive spaces

STREET ART OF KOLKATA: ROLE IN CULTURAL REFLECTION AND REALIZATION OF THIRD SPACE

Surjali Das
School of Planning and Architecture, New Delhi

Art is a universal language- street art is a magical brunch of it, has the power to bring back life into an empty wall. The street art has the power to reflect the culture of the place and be voice of the cultural upliftment of the region. The street art and graffiti are so perfectly fitted in the cultural city Kolkata, that sometimes it becomes hard to separate them from the cityscape. For a richer urban experience graffiti and street art are non-ignorable here. The city itself is possibly the best gallery- The spaces here are more than material-mental binary, creating a lived experience in Lefebvre's words and "third space" in Soja's words. The street art here performs so perfectly that produce sustainable urban regeneration through placemaking. It creates cultural identity, it changes and addresses the issues of gender discrimination (SDG goal 5), inclusion, participation and voice of migration (SDG goal 8), promote public spaces (SDG goal 11), expresses freedom of artistic expression (SDG goal 16) and taken care of international integration of cultural diversion (SDG goal 17) and so many.

Through field survey, questionnaire survey, and detailed phonetic interviews the paper has analyzed the role of street art and graffiti in sustainable Development Goals 2030. It also explores and examines perspective of participants on street art all over the city and realization of third space aspect along with its interaction with human and reflection of its culture. Western graffiti mixes with Bengali culture here to give birth to a new hybrid wall space. In the traditional black and white there are always shades of Gray- street art here is that- the third space. The participatory "road long Alpona", the wall art of "Rong Chobi Para" are the reflection of cultural inclusion and integration, reflects the power of participation in a community. Similarly, the Subodh graffiti united neighbouring Bengaladesh and West Bengal in the matter of cultural dimension and freedom of artistic expression. On the other hand, the missing girl graffiti opens up about the discriminatory condition of women in the society and voice up for security of them. While the political graffiti, the special "Khela Hobe" graffiti promotes development-oriented issues and policies. Other than this, the art form never fails to creates vibrant public spaces: for example, the Baul in Nandan campus. This art form is different for everyone- but differences living together make the space the appropriate third space. People here soundly appreciate the art and can be attached to it mostly when participating actively.

Keywords: Street art, Graffiti, Cultural reflection and upgradation, Third Space, Lived space, Kolkata

AESTHETICS, CITY BRANDING, AND PLACEMAKING: UNDERSTANDING HOW THE AESTHETIC APPEAL OF THE ELEMENTS OF THE BUILT SPACES CAN BE INFLUENCED THROUGH THE STIMULATION OF SENSORY PERCEPTIONS

Varun Kathuria[1], Suparna Saha[1]
[1]Department of Planning and Architecture, NIT Rourkela

City branding, a tool for urban regeneration, focuses on giving people a warm and welcoming image of the city and reinforcing their sense of belongingness. Branding of any object or place considers all the tangible, intangible, sociological, and psychological elements associated with it. The physical or tangible aspects influencing the perception and branding of a city include its architecture, heritage, religious practices, festivals, food, and cinema, among many others. In the present context, to increase a city's attraction potential, it needs to communicate a lucrative image among a broad spectrum of target audiences, including tourists, pilgrims, food enthusiasts, adventure lovers, sports fans, vloggers, influencers, and many more. Developing a 'brand image' helps contribute to a city's economic resources and forfends against adverse publicity.

Aesthetics (or attractiveness), a branch of philosophy, plays a vital role in city branding. A place's aesthetic quality is a crucial measure of its perceptible quality, which subsequently plays a role in its branding. How a person comprehends a place has a lot to do with its aesthetic appeal. We visit places to regulate our moods,

build relationships, and over time, we become sensitive to specific settings. An urban experience that appeals to our aesthetic senses provides us with pleasure. In the present Indian context, there exists a dearth of literature and research exploring the correlation between aesthetics and the physical or tangible aspects influencing the branding of a city.

Placemaking is a human-centric approach, process, and philosophy that enhances the 'attractiveness' of public spaces. As a tool for city branding and urban regeneration, placemaking helps convert underutilized public spaces into meaningful places and further helps transform locations into destinations with the help of policies, innovations, and investments. A great place is accessible, well-connected, comfortable, safe, and gives a good impression. It is a social setting that entices people to engage in activities where people wish to gather and return frequently. Placemaking brings a sense of satisfaction, civic pride, ownership, and attachment.

The perception of the aesthetic appeal of an object is influenced by our perception of the same through our five senses. Stimulating our five senses of sight, sound, touch, taste, and smell helps us become aware and consequently appreciate and respond mentally and emotionally to the beauty in the objects around us. Based on the literature study, the present paper explores how aesthetic appeal can influence the perception of different elements of built spaces that contribute to placemaking, and further city branding, by stimulating our sensory perceptions.

Keywords: aesthetics, city branding, image of a city, placemaking

SUSTAINABLE URBAN REGENERATION THROUGH PLACE MAKING: A CASE IN BENGALURU

Namrata Pulsay
Department of Architecture, Brindavan College of Architecture, Yelahanka, Bengaluru

Urban regeneration is a strategy that several nations have used over the past few decades to address social issues, boost local economies, improve the ecological and cultural circumstances, and increase the competitiveness of cities. Cities and towns are hubs of activity and destinations for consumption. Many communities have supported urban renewal in an effort to keep people in cities and entice others to stay. Cities have turned to urban regeneration to address the problems of decline, underutilized land, and urban decay. These issues weaken the city's image livability and productivity. According to the U N Sustainable Development Goals (11), UN: 2030 agenda, which aims to achieve "Sustainable cities and communities" .The objectives of this paper include :-(a)To understand the evolution and concept of sustainable urban regeneration.(b)To understand the parameters and strategies for sustainable urban regeneration.(c) To understand the different approaches to regeneration through case studies and see what impacts they have on the population and environment. (d) Connecting issues to larger urban network and these aims to revive and intervene the area for sustainable cities and communities.

Keywords: sustainability,urban regeneration, placemaking, underutilised areas

TRACK-5: SUSTAINABLE TRANSPORTATION

What are the sustainable ways of transportation in terms of their social and environmental impact? How can it be achieved? What are the new challenges and solutions in sustainable mobility?

ASSESSING IMPACT OF MASS RAPID TRANSIT SYSTEM RELATED URBAN DEVELOPMENT OF EXISTING NODAL AREAS IN A CITY: IDENTIFICATION OF RELATED PARAMETERS

Suman Mandal[1], Sanjib Nag[2]
[1]School of Architecture and Planning, Kalinga Institute of Industrial Technology, Bhubaneswar
[2]Department of Architecture, Jadavpur University, Kolkata

Mass Rapid Transit System (MRTS) is often considered among the most popular means of public transit in the world, having been developed to address intercity transportation issue. MRTS with increased accessibility and mobility gradually brings about some dynamic changes in Urban Development pattern of a city. Urban Developments are defined by the overall growth of an urban area or areas that reflects similar characteristics. These processes of growth and its physical manifestations can reflect a wide range of attributes especially around Existing Nodal Areas of a city. Nodes are usually defined as intersection of major movement network which act as major centre of activity throughout the day because of concentration of different function around it.

When MRTS is introduced it impact overall volume of activities significantly and therefore directly influences the Urban Development around Existing Nodal Areas of the city. Dedicated high-speed, high-capacity corridors of MRTS improve the intercity mobility, frequency, and accessibility and thereby create a lasting impact on the overall Urban Development of adjoining areas which includes land use, structure, urban form etc. Such impacts are much more evident in major urban nodes around station areas. This often led to the commercialisation and development of a variety of activities including informal activities around these nodes resulting in rapid transformation around these areas.

Like many other developing nations introduction of MRTS can be observed in many Indian cities. As a result the overall quality of urban transportation was raised significantly and thereby increasing the quality and speed of overall urban development of the city especially in major urban nodes around station areas. From available studies it has also become evident that these changes have been mostly poorly managed, intermittent, and fragmented, resulting in an degradation of overall urban environment. Which establishes the need to assess the impact of MRTS related Urban Development in Existing Nodal Areas of a city. So that strategies and recommendations can be formulated to direct this urban development in a desired direction.

In this paper an attempt has been made to assess the relationship between MRTS, Urban Development and Existing Nodal Areas of a city. Following this a further attempt would be made to identify related parameters involved especially from Urban Design viewpoint. Future research would establish an interrelationship between these parameters identified which can be used to assess the impact of MRTS related Urban Development around Existing Nodal Areas of a city selected as case study.

Keywords: MRTS, Urban Development, Existing Nodal Areas, Urban Design Parameters

AN OVERVIEW OF FACTORS INFLUENCING WALKABILITY IN URBAN AREAS

Neha Mittal[1], Tejwant Singh Brar[1]
[1]Sushant School of Art and Architecture

Growing population and rapid urbanization is matter of concern to the cities, urban planners and policy makers these days. 54% of world's population lives in urban area. Global urbanization presents major socio-economic challenges. Amid fast growing cities population, transportation problems are increasing and cities are becoming more unsustainable. Among the five mega cities of India, the use of public transportation is more than 20% only in two cities. India is still struggling in terms of creating a demand centric transportation system. This paper contributes by discussing the various short comings at various stages of Government plans and policies in transportation sector. The main shortcomings in the Government policies are exclusion of community groups and target beneficiaries, lack of monitoring, institutional capacities and urban governance, irregular zoning of land and inefficient comprehensive development and mobility plans. The key challenges in many cities of developing countries are lack of awareness about the wide benefits of

non-motorized infrastructure. Further discussing the Non- Motorized Transportation (NMT) as Sustainable Transportation and how it can help meet transportation planning goals including reducing traffic and parking congestion, as well as lowering energy consumption and environmental emissions. The global pandemic, Covid-19 has greatly promoted non-motorized activities such as biking and car sharing in cities around the world and thus paper aims to discuss the status of walkability as Non-Motorized Transportation in India. Furthermore, the factor which influences the walkability in cities has been elaborated to promote walkability and thus planning the cities more walking friendly post pandemic. The most common factors found are Safety, Distance, availability and quality of pathways, enclosure of streets and infrastructure for disabled. When it comes to active commuting to and from school, proximity and density are among the strong connections among adults who walk. The paper concludes discussing the potential of develop infrastructure for pedestrians post Covid-19 to encourage people to continue walking as large percentage of people are found shifting to Non- Motorized transportation specially Walking during pandemic Covid-19.

Keywords: Non-Motorized Transportation, sustainable transportation, Walkability, Covid-19 mobility, Pedestrians

DESIGNING SUSTAINABLE NEIGHBOURHOODS: CHARACTERISTICS OF THE ARCHITECTURAL REALM INFLUENCING WALKABILITY

Neha Mittal[1], Tejwant Singh Brar[1]
[1]Sushant School of Art and Architecture

Growing population and rapid urbanization is matter of concern to the cities, urban planners and policy makers these days. 54% of world's population lives in urban area. Global urbanization presents major socio-economic challenges. Amid fast growing cities population, transportation problems are increasing and cities are becoming more unsustainable. Among the five mega cities of India, the use of public transportation is more than 20% only in two cities. India is still struggling in terms of creating a demand centric transportation system. This paper contributes by discussing the various short comings at various stages of Government plans and policies in transportation sector. The main shortcomings in the Government policies are exclusion of community groups and target beneficiaries, lack of monitoring, institutional capacities and urban governance, irregular zoning of land and inefficient comprehensive development and mobility plans. The key challenges in many cities of developing countries are lack of awareness about the wide benefits of non-motorized infrastructure. Further discussing the Non- Motorized Transportation (NMT) as Sustainable Transportation and how it can help meet transportation planning goals including reducing traffic and parking congestion, as well as lowering energy consumption and environmental emissions. The global pandemic, Covid-19 has greatly promoted non-motorized activities such as biking and car sharing in cities around the world and thus paper aims to discuss the status of walkability as Non-Motorized Transportation in India. Furthermore, the factor which influences the walkability in cities has been elaborated to promote walkability and thus planning the cities more walking friendly post pandemic. The most common factors found are Safety, Distance, availability and quality of pathways, enclosure of streets and infrastructure for disabled. When it comes to active commuting to and from school, proximity and density are among the strong connections among adults who walk. The paper concludes discussing the potential of develop infrastructure for pedestrians post Covid-19 to encourage people to continue walking as large percentage of people are found shifting to Non- Motorized transportation specially Walking during pandemic Covid-19.

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DESIGNING SUSTAINABLE NEIGHBOURHOODS: CHARACTERISTICS OF THE ARCHITECTURAL REALM INFLUENCING WALKABILITY

Dr. Rakesh K S
SAN Academy of Architecture, Coimbatore

The prime ingredient of urbanism is public space and the public realm. The public realm ties cities together and is a potential source of joy and inspiration to all citizens.

"Sustainable Urbanism", reduced to its most basic principles, is walkable and transit-served urbanism integrated with high-performance buildings and high-performance infrastructure; where compactness and human access to nature are core values and where aspects of sustainability, functionality and interconnectivity are more important than design.

In walkable neighbourhoods and centres, streets are public spaces that serve multiple social and economic functions while contributing to the beauty and character of a community. Such thoroughfares include main streets, boulevards, avenues, "shared space" streets, and local streets designed for slow traffic speeds.

It's much easier to walk in a place with an active building face than it is to walk past parking lots, parking garages, or blank walls. The two are related, the public realm and walkability — the quality of the walkable experience is dependent on street frontage.

Numerical standards fail to evaluate the plethora of activities characterizing the pedestrian environment. Thus, pedestrian spaces should be evaluated on the basis of satisfaction of diverse pedestrian needs and not just adequacy for walking.

The qualities of a street are entirely different from those of a road. The architectural environment plays a significant role in the imageability of the urban environment.

Buildings and development must be appropriate and unique to the particular town or city in which they are located. The dimensions of buildings, squares and streets should be scaled to the proportions of the human figure.

Physical and Visual Permeability, Variety of form, use and meaning, Legibility in terms of built form as well as patterns of activity, Robust spaces which can be utilized for diverse functions, the richness of the space with its capability to enable users to choose between various sensory experiences, Personalization of spaces are some of the principal characteristics which shape the sensory experience of the pedestrian environment.

Pedestrian spaces are vanishing from many of the urban areas in India, due to the rapid pace of increase in vehicular traffic. This leaves them all the poorer in comparison to the attractive, intricate places of older settlements, which were principally designed in accordance with the scale of pedestrians and not motorists. With a large number of trips being performed on foot, the focus of planners and designers is returning to the design of the public realm as an organic, complex, human-scale and attractive environment.

This presentation focuses on the important characteristics of the public realm which impact walkability and consequently sustainable communities.

Keywords: Walkability, Public Realm, Sustainable Communities

CYCLING THROUGH THE CITY

Vishal Jain
Bhubaneswar Urban Knowledge Centre – PgMC by Arcadis IBI Group India Private Limited

Many cities around the world are working to increase the number of cyclists. Ask them why and you will get a mixed bag of responses – we are overcrowded with cars, our air quality is bad, we saw someone else do it. The message is unclear, the plan uncertain, the future vision for the city undefined, and thus, progress gets stuck. But there is an incredible opportunity to transform our cities through cycling – unlocking vast social, economic, and environmental benefits for everyone – if we can get the message right. In terms of its social impact, cycling has numerous health benefits, is an affordable mode of travel since it has the lowest capital and infrastructure cost and promotes equality in the community. In terms of its environmental impact, it is a known fact that cycling reduces carbon emission, and its carbon footprint is zero and is an energy conserving mode of commute.

The key to achieving high levels of cycling appears to be the provision of separate cycling facilities along heavily travelled roads and at intersections, combined with traffic calming of most residential neighbourhoods. Extensive cycling rights of way in the Netherlands, Denmark and Germany are complemented by ample bike parking; full integration with public transport, comprehensive traffic education and training of both cyclists and motorists, and a wide range of promotional events intended to generate enthusiasm and wide public support for cycling. In addition to their many pro-bike policies and programmes, the Netherlands, Denmark and Germany make driving expensive as well as inconvenient in central cities through a host of taxes and restrictions on car ownership, use and parking. Moreover, strict land-use policies foster compact, mixed-use developments that generate shorter and thus more bikeable trips. It is the coordinated implementation of this multi-faceted, mutually reinforcing set of policies that best explains the success of these three countries in promoting cycling.

A cycle friendly city can be achieved through a combination of micro level interventions (with contextually appropriate measures for the citizens) supported by macro level interventions (policies and plans that target the large vision of the city and nudges towards NMT as the primary mode of movement). Bhubaneswar is a prime example of this tactic with its 40 km network of cycle tracks and 120 km of footpath along the city roads supported by the recently notified street design regulations of Bhubaneswar and the Draft Child Friendly Public Space Design Guidelines. These documents provide teeth to the city authority at a policy level but the implementation requirements at a spatial level are being fulfilled by the city side Non-Motorised Transport Master Plan and the Low Carbon Mobility Plan (both under draft stage).

Keywords: affordable, equality, carbon emissions, energy conserving, cyclists, cycling, bikeable trips, NMT, Low Carbon, Public Space

APPROACHING MOBILITY FOR INDIAN SMART CITY – STUDY OF BHUBANESWAR

Vishwam Chandrayan[1], Satyaki Sarkar[1], Prashant Prasad[1]
[1]Department of Architecture & Planning, Birla Institute of Technology, Mesra, Ranchi

The ongoing urbanization and increased automobile ownership are having an impact on urban traffic, resulting in traffic jams, decreased efficiency of road network services, and losses to the community economy. According to the World Health Organization, about 1.2 million people die on the roads each year, a figure similar to some of the worst epidemics. 95 percent of all motor vehicles are powered by fossil fuels. These cars account for more than one-fifth of global CO_2 emissions. In congested cities, average speeds might approach 20 kilometres per hour, creating stress and productivity losses. Solutions are required in order to tackle the issues at hand and support and/ or improve accessible public transportation while also taking environmental considerations into account. India is in a precarious position right now. While the general public's inability to move around efficiently and effectively outside of major cities continues to stifle economic growth and reduce productivity in a significant way, the growth of passenger vehicles and two-wheelers in major urban centres is making pollution and traffic jams worse. Considering the planned city of Bhubaneswar, this paper aims to

examine the existing scenario in the city of Bhubaneswar in terms of intelligent public mobility focusing on the bus service. In this study a literature review is conducted to fill the knowledge gaps regarding intelligent mobility, safe and sustainable public transportation, and socio-technical infrastructure required for intelligent mobility and the various tools and techniques that have been applied in previous studies across the world. Based on this literature review, a database is created using various primary and secondary sources. Further, using traffic simulation and data analytics the database is analysed in terms of certain identified aspects. The study is expected to highlight the need for intelligent mobility solutions that can be applied in order to improve connectivity and ease of movement in transit hubs thereby increasing the attractiveness of Public Transport systems. The outcomes of this study can further help planners and stakeholders to highlight the areas that need intelligent interventions and make a positive impact on congestion related externalities such as air pollution, noise pollution and travel time which can contribute towards the Sustainable Development Goals (SDG) 11, i.e., make cities and human settlements inclusive, safe, resilient and sustainable.

Keywords: Intelligent Mobility, Urban Development, Public Transportation

APPLICATION OF TACTICAL URBANISM FOR ENHANCING ROAD SAFETY: CASE STUDY OF BHUBANESWAR CITY, ODISHA

Soonena Mohanty[1], Annam Sai Kiran[1], Tiyali Bose[1]
[1]School of Human Settlements, XIM University

According to WHO, 1.35 million deaths occur on the roads each year. In India approximately 1,50,000 people die from road crashes annually which is also the world's highest. Traffic accidents are the ninth leading cause of mortality across all age groups. Vulnerable road users like pedestrians, cyclists, and motorcyclists, account for more than half of all deaths globally.

Road safety is influenced by various roadways, vehicle, human, and environmental factors including geometrical characteristics, road markings and signages, illumination, traffic composition, vehicle condition, weather characteristics, driver behaviors, enforcement of traffic rules, etc. Road intersections are often the hub of various activities in an area. The volume of mixed traffic intermingling and moving towards multiple directions, along with the volume of pedestrian- vehicular interactions is highest at these points. Thus, making road intersections a major site for disproportionately large number of traffic accidents in a road network.

The traditional solutions to improving safety at intersections have been limited to engineering interventions like construction of medians, channelising traffic islands, refuge islands, FOBs for pedestrians, etc. However, any kind of permanent construction is expensive. Additionally, in cases of faulty designs, both the vulnerability of the users is compromised, as well as the cost of construction increases further. Thus, one of the cost effective solutions for enhancing road safety is through the process of tactical urbanism. It is a method for making temporary changes to the urban environment that is efficient, affordable, and scalable. It is an evidence-based strategy that can be used in high-traffic areas to slow down vehicles and improve amenities for pedestrians and cyclists. Moreover, once their effectiveness has been established during the trial periods, the interventions can be used to administer interventions permanently. Hence the aim of this study is to redesign a traffic intersection in Bhubaneswar for safe and equitable distribution of road space for all road users.

The case study location is Jaydev Vihar in Bhubaneswar, which has experienced a total of 11 Crashes in the last three years, of which 5 were fatal accidents. It is one of the top 5 blackspot intersections in the city. Jaydev Vihar is a five-armed junction and is also a hub to major landmarks like Kalinga Stadium, CSIR-IMMT, Palheights etc. Furthermore, issues like discontinuous footpaths, lack of pedestrian road crossing infrastructure, lack of infrastructure for cyclists, multiple local roads directly opening onto the arterial road, encroachment of shoulders by illegal vending activities and parking, etc. plague the junction. Thus, highlighting the criticality of the junction and the immediate need for implementation of various road safety interventions.

Keywords: Tactical Urbanism, Road Safety, Road intersection, Equitable Road space

RE-ORGANIZATION OF ROW (RIGHT-OF-WAY) TO MITIGATE TRAFFIC CONGESTION: CASE STUDY OF SCB MEDICAL ROAD, CUTTACK

Puneet Patnaik[1], Tiyali Bose[1], Annam Sai Kiran[1]
[1]School of Human Settlements, XIM University

Congestion is a major transportation problem in most metropolitan cities globally. Studies estimate that the total annual cost of congestion ranges approximately from $2.3 billion to $3.7 billion for major urban areas, of which approximately 1.6 million US$ worth of fuel is wasted by vehicles idling at traffic signals. India loses approximately INR 60,000 Crore annually due to traffic congestion. Various studies on Indian cities observe that an average travel time delay of 20-60 minutes occurs for road users travelling during peak hour traffic. The situation is critical when emergency vehicles are delayed due to traffic congestion or any bottleneck situation arises near or along roads leading to medical facilities. According to the National Crime Records Bureau 2017, nearly 24,012 people die each day due to delay in accessing medical assistance. Additionally, traffic bottlenecks have severe impact on the environment, and long delay in travel time increases stress level leading to development of severe medical conditions among road users.

In case of Indian cities, congestion is not only a result of increase in vehicular traffic, but other factors include undisciplined road users, poor implementation of traffic rules, lack of effective carriageway due to unorganized on- street parking, illegal vending activities, etc. Thus, taking into consideration all the above factors, the current study aims to formulate a congestion mitigation plan for the SCB medical road in Cuttack through re-organization of the right of way (ROW).

SCB is a state-level medical institution and proposals have been sanctioned for its further upgradation to AIIMS. The current footfall at SCB is estimated at 30,000 and it is expected to increase further to more than 50,000. The existing SCB Medical road leading to the main entrance of the hospital is a two-way lane with an average ROW width of 37'. However, due to encroachments, the effective carriageway width often varies from 12' at Diagnostic Centre (BP Lab) to 24' at Medical Laboratory. The situation worsens when advanced life support ambulances access the infrastructure. An average delay of 10 to 15 minutes is observed before the traffic revives to a smooth flow. A detailed road inventory study along with mapping of activities have been undertaken to understand the existing issues in the study area, and to develop a detailed ROW re-organization plan for maximum usage of effective carriageway.

Keywords: Congestion Mitigation, ROW Re-Organization, Effective Carriageway, Activity Mapping

ASSESSING FINANCIAL FEASIBILITY OF ELECTRIC BUSES IN PUBLIC TRANSPORTATION

Pooja Aradhana Pradhan[1], Annam Sai Kiran[1]
[1]School of Human Settlements, XIM University

Public Transportation is considered to be the most effective tool for solving multiple urban challenges such as congestion, parking availability etc. The major advantages are better connectivity, saving time of the passengers, alternatives for individual vehicles, reducing stress on parking spaces, reduction in carbon footprint etc. Given the numerous advantages of switching from traditional diesel buses to electric buses in terms of local pollution, noise, and fuel consumption, electric buses can play a constructive role. Electric buses will help emerging cities in addressing issues like pollution (air, noise) and reduction in greenhouse gases. Undoubtedly, electric buses create hope for a sustainable future which works on unconventional method of operation, but the barriers in switching towards electric bus are mainly high upfront cost of procurement, lack of financing options, rigid financial models for procurement, lack of long term financing option etc. A cost benefit analysis of both diesel and electric bus would indicate a better investment option among the two in a long run. Financial feasibility study will suggest the need of interventions for cost reduction. Therefore, the aim of the study is to evaluate the financial feasibility of electrification of buses for an urban public transport system.

In this study, various costs and benefits associated with adoption of electric bus have been identified. The parameters for cost calculations include infrastructure investment costs, cost of the bus fleet, maintenance cost, replacement costs, cost of system operation and maintenance etc. Also parameters for benefits calculations include revenue generated (ridership revenue and advertisement revenue), Savings in vehicle operating cost, environmental benefit, savings in travel time, reduction in accidents, non-consumption of fossil fuel in monetary form. Additionally, the factors affecting cost and benefits in different stages were also identified which includes policies, technology, procurement model, fiscal incentives, financial mechanism, and business model.

The work is demonstrated for Bhubaneswar city. The city public transportation service has initiated the adoption of electric buses in few routes. Data required for the study are collected from the bus operators i.e. Capital Region Urban Transport (CRUT) and other relevant organizations. Data consists of technical specifications (dimensions, seating capacity, bus range), vehicle cost, infrastructure cost, funding pattern, battery replacement cost, total fleet size, route wise distribution of buses, cash flow statements, etc. Based on the feasible analysis of electrification of bus service for the study area suitable recommendations have been provided in terms of procurement models, subsidy, policy, fund utilization, institutional interventions, stakeholder involvement etc.

Keywords: Electric mobility, benefit cost analysis, feasibility analysis, sustainable public transportation

TRACK-6: GENDER-SENSITIVE AND AGE-FRIENDLY CITIES

How to make cities inclusive of gender and age? How to involve them in the decision-making process? What are the innovative ways of designing these cities?

ENRICHING THE URBAN NEGATIVES THROUGH PLACEMAKING SOLUTIONS

Antara Sablok[1], Bimal P[1]
[1]Department of Architecture and Planning, National Institute of Technology, Calicut

Cities nowadays are the most important element of each individual's life in the state, regardless of where they live. Cities increase economic prospects for its citizens, but the inflow of people affects the city's liveability due to a shortage of public areas. This necessitates the need to optimize the current resources by identifying the urban negatives. City planners frequently utilize their objective perspective to create a frozen vision of the city filled with everyday interactions. The city needs to be viewed as dynamic in nature, with even its concrete planning and infrastructure changing in response to population demand in terms of space, time, and energy. Conventional urban planning exercises have traditionally focused on long-term and goal-oriented planning interventions for city growth. With the vitality of cities throughout the world, there is an increasing demand for creative, adaptive, and short-term solutions for urban activation. Interstitial areas are typically abandoned, underutilized spaces lacking defined land use, and are in-between phases of formal development, often waiting forever to be utilized. These spaces have the potential but are often neglected due to the lack of formal identity and function associated with it. Due to a lack of adequate use identification, they have been exploited as an area for garbage disposal or as a shortcut route to a side alley. These areas include a variety of identities that must be handled before they can serve as a backdrop to city life. The residual spaces act as the "Room of Everything of the imaginary Hogwarts School", a space that can serve the community in the way the community desires to use it. It can be a revenue generation area with bars and cafes or can be a social cohesion area created with pocket parks or it can be a creative landmark place with temporary and permanent art installations. The research paper focuses on the exploration of interstitial space identification, stakeholder consultation, and value evaluation and investigates the application of placemaking solutions for these areas for value and revenue generation. It discusses the means for the correct assessment of value and usage of the space with stakeholder identification and prioritization using tools and methods like snowballing, ANT, SHA, etc., It consolidates the methods being used for social and economic value evaluation like Sociotope Mapping, etc. Case studies from around the world have been assessed with parameters as discussed earlier and categorization of placemaking solutions like strategic, creative, and tactical solutions based on their application structure. Findings show that interventions have been excellent retrofit solutions in enhancing the liveability quotient and image of the city, inculcating a sense of belongingness into the community for the otherwise neglected spaces. It also highlights the importance of such area-concentrated planning interventions in the larger city planning domain to ensure efficient space resource utilization.

Keywords: Urban Negatives, Placemaking solutions, City Branding, Liveability, Social Cohesion

SUSTAINABLE DEVELOPMENT GOALS AND GENDER EQUALITY: EMPOWERING WOMEN IN SMART CITY-REGION

Vinita Yadav[1], Sherin Jacob[2]
[1]School of Planning and Architecture, New Delhi
[2]St. Claret College, Bangalore

Sustainable development goals (SDGs) aim to bring equity in all aspects of living. Gender equality aims at bringing parity to society. SDGs have a crucial role to play in empowering women and restoring the balance between genders. SDG 5 aims at addressing issues related to women's empowerment to achieve gender equality. This is to eliminate all forms of discrimination against women. Other SDGs are also indirectly linked to the aspect of gender equality. The paper aims to analyse best practices for empowering women in smart city regions to achieve the SDG. The objectives are to understand the relationship between SDGs and gender; analyse the best practices in smart city regions for empowering women, identify issues, and formulate strategies for enhancing the capacity and capability of women to achieve gender equality. The paper reviews literature related to SDG, gender equality, and female empowerment, obtaining documents from the United Nations, UN-HABITAT, International Labour Organisation, policy briefs of the International Institute for Sustainable Development (IISD), and websites from the World Economic Forum, (ILO), Smart

City Sweden, the Guardian, and Nagrika. The infrastructure projects implemented to empower women in the smart city regions in India and Europe are also referred to from government documents. The gender-sensitive planning information and data of smart city regions have been gathered from smart city reports. Both international (Umea in Sweden, and Aspern in Vienna) and Indian (Bhopal and Coimbatore) case studies have been chosen to highlight measures for creating gender-friendly cities in the region. Bhopal is among the ten most unsafe cities for women in India. It has initiated projects to enable the safe transportation of women. For developing smart city, slum dwellers have been evicted. It led to job losses and an increase in living expenses. Loss of income has plunged them into extreme poverty. Coimbatore is the safest city for women in India. It's forty percent of its board members in the smart city initiative are women. However, in both cities, no specific women-centered interventions have been carried out as part of smart city projects. Umea smart city project resulted in increased street lighting, wider pavements, and round corners, which allowed the creation of a safe city for women. Aspern city is a city with a 'female face' as it accords significance to women in city planning. The city region planning should focus on gender budgeting and friendly legislation in its mainstreaming strategies. The planning shall adopt a gender lens to ensure sustainability.

Keywords: Sustainable Development Goals, Gender Equality, Smart City-Region

WOMEN'S MOBILITY AND ACCESS TO CITIES: A STUDY OF DOMESTIC WORKER'S EVERYDAY MOBILITY IN KOCHI, KERALA

Fathima Zehba M. P. 1, Mohammed Firoz C. [1], Lakshmi Priya Rajendran[1]
[1]Department of Architecture and Planning, National Institute of Technology Calicut

Freedom of movement and access in cities are generally designed considering ethnic majorities- heterosexual, non-disabled men (Hidayati et al., 2010). Studies show that women make more complex movements than men to fulfilling their responsibilities (Whitzman, 2013). However, due to the lack of access to various amenities and services in everyday life in cities, women in urban areas are not as equally benefitted as men. Access is one of the critical parameters to consider while planning for inclusive cities. In this paper, we explore the barriers due to lack of access in cities by examining the factors affecting the everyday mobility of women. Using a case study of Kochi city in Kerala, India, the study investigated the diverse factors which impact the mobility of women domestic workers in the city. We employed a mixed-method exploratory design in our research. First, we conducted a systematic review of the literature on the subject to identify a set of initial factors that affect the everyday mobility of women in cities. Field studies included focus group discussions and in-depth interviews with key stakeholders to capture the issues embedded in participants' socio-cultural settings and personal beliefs and experiences. Based on the results, we conducted a thematic content analysis to identify and prioritise the factors, both intrinsic (individual attributes such as age, income, employment status, marital status) and extrinsic (spatial and urban planning attributes such as residing location, public transport availability and affordability, gender-inclusive design features, safety features, etc.) Second, the pattern of participants' daily mobility was mapped and visualised in the form of space-time paths and space-time cubes. The correlation between the factors and women's accessibility was checked by taking the 'potential path area' as the measure of accessibility. The study helps to understand the relative importance of each factor, thereby aiding planners in identifying the areas of intervention for effective gender-sensitive interrelationships planning and design. Further, the study will facilitate an understanding of the critical and implicit relationship and interplay of intrinsic and extrinsic factors that affect women domestic workers' everyday mobility in cities.

Keywords: Gendered mobility, daily mobility, inclusive mobility, gendered accessibility, space-time path, time geography

TRACK-7: DIGITAL SOLUTIONS FOR SUSTAINABLE CITIES

How can digital technology be used to make better decisions and improve quality of life? How do digital infrastructure and governance play an important role in channelling digital solutions for a safe future? What are the emerging aspects of digital urbanism? How to address the challenges of digital inclusion and divide?

CAN 'OPEN DATA' PARTNERSHIPS FOR SUSTAINABLE URBAN DEVELOPMENT ADDRESS THE GLOBAL NORTH-SOUTH DIVIDE?: EXPERIENCES FROM INDIA, GERMANY AND THE REPUBLIC OF KOREA

Mohit Kapoor[1], Mathias Jehling[1], Saebom Song[2]
[1]Leibniz Institute of Ecological Urban & Regional Development (IOER)
[2]Karlsruhe Institute of Technology (KIT)

Over the last decade, due to technological innovations available to our cities, we have witnessed a transformational change in urban planning, management and governance practices. The ease of availability of datasets, IT solutions, online dashboards, etc. has facilitated Urban Local Bodies (ULBs) to deliver efficient public services, thereby, enhancing the quality of life for the citizens. Increasing use of Open Data by urban stakeholders facilitates transparency, participation and equity. In the Global North, smart cities discourse incorporates Open Data and ideas of collaboration for urban services. Authors have described that digital technologies and urban sensors generating Geospatial Open Data, dramatically decrease the development costs while accelerating the learning curve for operating smart cities. Similarly, past research on Open Data for development has shown potential in the Global South where progress can often be inhibited by socio-economic factors.

Government of India announced the Smart Cities Mission program in 2015 to make better use of technology for urban management and governance. Within this program, the creation of a National Urban Digital Mission (NUDM) focused on empowering citizens through responsive and participatory governance, and the Integrated Command and Control Centre (ICCC) enabled collation of information for monitoring and improving city operations. This initiative aims to institutionalize 'data-driven culture' in cities, with a key focus on people, processes and platform. The Smart Cities Open Data Portal (SCODP) hosting more than 5000 urban datasets from 100 Smart Cities, attempts to further build this dialogue with citizens and civil society actors through data-driven urban governance. Therefore, it becomes important to ascertain whether the intended outcomes of such digital initiatives have been realized or not. Which factors are hindering or enabling such citizen-centric digital initiatives for sustainable urban management and governance? And what new strategies are required to address transparency, participation and equity issues through digitalization in urban India.

To deepen our understanding in the global context of Smart Cities and Open Data, best practices and use cases from Global North countries - Germany and Republic of Korea are discussed in this paper. These countries have similar governance structures like India, but different dynamics of urbanization and adaptation of digitalization in their cities. The Government of the Republic of Korea has promoted Open Data use in cities since 2013 and with the recent notification of 3rd Open Data Master Plan in 2020 aims to create a transparent government encouraging collaboration and co-creation with urban stakeholders. On the other hand, German cities show dynamics in performing the balancing act between addressing data privacy concerns and using Open Data for urban management and governance. As a result, innovative practices combining legal and technological solutions for Open Data in Smart Cities emerged in Hamburg, Berlin and Bonn.

In this context, the paper discusses varied experiences of Open Data practices in three countries and contributes to a better understanding of inclusive and transformative policies and implementations that can address the Global North-South divide. It highlights the potential pathways to create Open Data partnerships for a better urban future across cultural and socio-political contexts.

Keywords: Digitalization, Smart Cities, Open Data, Evidence-based decision making, Data-driven urban planning

OPTIMIZING CROWD FLOW IN GRANDSTAND ARRANGEMENTS

Keshav Jasoriya[1], Prashant Prasad[1]
[1]Department of Architecture and Planning, Birla Institute of Technology, Mesra

Simulation models are becoming increasingly popular in the AEC industry and have had massive impacts on the performance and predictability of designed systems and structures. Data-driven decision-making thus becomes an essential part of the process, enabling simulation models to perform better and assist us in making better decisions and projections, and AI and machine learning are ever-growing contributors to the same. Because of the diverse origins and destinations, as well as the mix of waiting and strolling pedestrians,

planning transit platforms may be a difficult issue. An accurate assessment of pedestrian trajectories is required to determine demand at various spots on the platform. The expected walking distances and the sources and destinations are important factors in this. According to the literature, it is unclear how people pick their destinations on the platform and hence their itineraries. One common assumption is that passengers, particularly regular commuters, already walk to the place on the platform at their origin station to try and minimize the distance to the exit at their destination.   The paper attempts to establish a framework for a model that acts as a design tool for designers and planners of transit nodes and corridors, making it simpler for designers to make data-informed decisions based on user input. An accurate assessment of pedestrian trajectories is required to determine demand at various spots on the platform. Because of the diverse origins and destinations, planning transit platforms may be a difficult issue. Building transit stations to suit present and future demand, a thorough understanding of predicted pedestrian movements on the platform is required. The paper has a wide spectrum of use cases, which have been defined in the research. The research formulates a framework for future development and optimization for more accurate implementation and monitoring. This research tries to combine Agent-based simulation and genetic algorithm-based simulation to optimize pedestrian flow and circulation. Currently, the needed fundamentals are not available at the desired depth. In rare situations, certain stations, particularly their platforms, may have hit capacity restrictions. As a result, multiple transit platform additions are planned. As a result, multiple transit platform additions are planned. To build transit stations to suit the present and future demand, a thorough understanding of predicted pedestrian movements on the platform is required. The amount of people on the platform and the time until the next transit arrived were other crucial factors in determining the waiting spot.

Keywords: Pedestrian simulation, Agent based modelling, Genetic based algorithm, Crowd optimization, Iterative model, Transit nodes

GEOMETRY AUGMENTATION FOR SPATIAL DEVELOPMENT TO OPTIMISE PEDESTRIAN FLOW AND CIRCULATION

Naritya Choudhary[1], Prashant Prasad[1]
[1]Department of Architecture and Planning, Birla Institute of Technology, Mesra

Simulation models are becoming increasingly popular in the AEC industry and have had massive impacts on the performance and predictability of designed systems and structures. Data-driven decision-making thus becomes an essential part of the process, enabling simulation models to perform better and assist us in making better decisions and projections, and AI and machine learning are ever-growing contributors to the same. Because of the diverse origins and destinations, as well as the mix of waiting and strolling pedestrians, planning transit platforms may be a difficult issue. An accurate assessment of pedestrian trajectories is required to determine demand at various spots on the platform. The expected walking distances and the sources and destinations are important factors in this. According to the literature, it is unclear how people pick their destinations on the platform and hence their itineraries. One common assumption is that passengers, particularly regular commuters, already walk to the place on the platform at their origin station to try and minimize the distance to the exit at their destination. The paper attempts to establish a framework for a model that acts as a design tool for designers and planners of transit nodes and corridors, making it simpler for designers to make data-informed decisions based on user input. An accurate assessment of pedestrian trajectories is required to determine demand at various spots on the platform. Because of the diverse origins and destinations, planning transit platforms may be a difficult issue. Building transit stations to suit present and future demand, a thorough understanding of predicted pedestrian movements on the platform is required. The paper has a wide spectrum of use cases, which have been defined in the research. The research formulates a framework for future development and optimization for more accurate implementation and monitoring. This research tries to combine Agent-based simulation and genetic algorithm-based simulation to optimize pedestrian flow and circulation. Currently, the needed fundamentals are not available at the desired depth. In rare situations, certain stations, particularly their platforms, may have hit capacity restrictions. As a result, multiple transit platform additions are planned. As a result, multiple transit platform additions are planned. To build transit stations to suit the present and future demand, a thorough understanding of predicted pedestrian movements on the platform is required. The amount of people on the platform and the time until the next transit arrived were other crucial factors in determining the waiting spot.

Keywords: Pedestrian simulation, Agent based modelling, Genetic based algorithm, Crowd optimization, Iterative model, Transit nodes

TRACK-8: SUSTAINABLE HEALTH, WATER, AND SANITATION

Accessibility, quality, and equity in WASH are primary to achieving sustainability in this sector. What are the approaches to bringing these aspects to make cities clean, green, and healthy? What are the policies? What are the gaps?
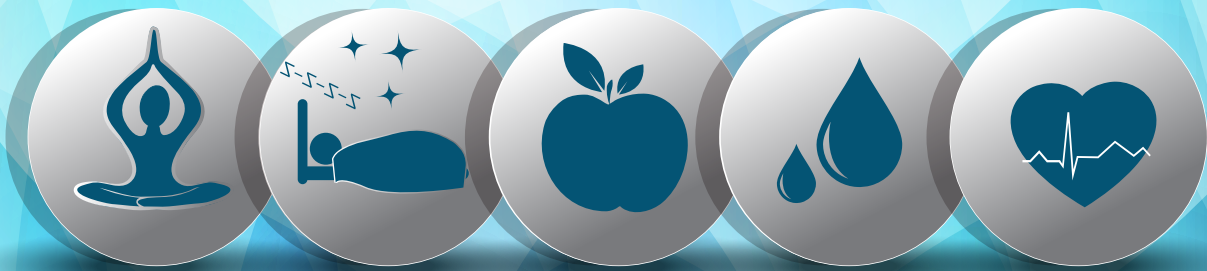
A SUSTAINABLE APPROACH TO WATER RESOURCE MANAGEMENT IN URBAN POOR SETTLEMENTS OF DELHI

Abhishek Anand[1], Sandeep Kumar[1], Shradhanjalli Mishra[1]
[1]Amity School of Architecture & Planning, Amity University, Noida, U.P.

Water resource management is the process of planning, developing, distributing, and managing water resources for optimal usage. Water cycle management is a subset of it. It is similar to hydrology, but the management scale is lower here, where hydrology involves states or countries, and water resource management (WRM) is at the city and district levels.

The basic aim of the study is to analyze the nature and extent of gaps in water distribution among urban poor communities in Delhi. Poor sanitation conditions have resulted from inadequate water access in these settlements. Slum residents generally use water kept in empty cans under horrendous conditions. Illegal private borehole owners play a significant role in water distribution in areas where households are not linked to the public water supply. Mismanagement of available water resources, a desire to service rich residential complexes, and exclusion of the urban poor have resulted in substantial depletion and contamination of the water table, particularly in south Delhi. Because the urban poor is not as involved in decision-making as other socioeconomically influential persons in the city, the local government is unable to assess their requirements and monitor existing infrastructure.

The research focuses on inadequate water distribution among the urban poor. Water issues are prevalent across Delhi, but the urban poor is disproportionately affected. Water availability varies according to the type of urban poor neighborhood. Two different slum settlements in south Delhi were examined to compare the elements responsible for water access. Jagdamba Camp in Sheikh Sarai, one of the survey areas, has the largest notified slum population in south Delhi. Similarly, Sangam Vihar is Delhi's most populous unauthorized urban poor colony. Water scarcity impacts a vast number of people because it is the most prevalent of its kind. Furthermore, groundwater overuse and contamination are serious environmental concerns in south Delhi. However, the unserved urban poor population, as well as surrounding prominent and wealthy colonies, serve as the primary commercial zones for unlicensed private water vendors. The majority of the RWAs in south Delhi are middle- and upper-income citizens. The socioeconomic imbalance has left the urban poor with minimal organizational capabilities. The informal and unplanned rise of slums, as well as insecure land tenure, has failed to ensure adequate water supplies among the urban poor. Poor cost recovery leads to a shortage of finances and, as a result, poor service delivery.

Keywords: Availability, Distribution, Resource Management, Urban Poor

INFRASTRUCTURAL DEVELOPMENT PLAN FOR CLASS-II CITIES OF INDIA- A CASE OF SHAJAPUR

Sorabh Verma[1], Pavan Kumar Tiwari[1], Abhinandan Bera[1]
[1]Birla Institute of Technology, Mesra

The objective of this study is to formulate an infrastructural development plan for Class-II cities of India by taking the case of Shajapur. Shajapur District is a part of Central Madhya Pradesh. The district is bounded by Ujjain and Agar-Malwa in the west, Dewas and Sehore in the South, Rajgarh in the North, and Sehore district in the east. This research argues that class-II cities, which are not intense but widespread, are the next urban hotspots posing several infrastructure-related challenges such as lack of basic amenities, including inadequate and dilapidated health and education infrastructure. These towns have often failed to get attention because they get overshadowed by bustling cities. Our programs like AMRUT and Smart cities mission, focus on urban areas leaving the outskirts.To propose an infrastructure development plan for Shajapur, the literature study identified key physical parameters WASH and Solid waste management, health, and Housing along with economic opportunity and an index based on consumption expenditure. Data regarding the mentioned parameters are collected via primary sources through questionnaires and visual surveys, and secondary sources such as NSSO district-level data, administrative records, the Census of India,

Public Health and Engineering Department (PHED). The united nation sustainable development goals and the ease of living index by the Ministry of Housing and Urban Affairs are used to overcome the gap that arises in the class-II cities by the identified parameters. To find the ease of living index based on identified parameters, statistical analysis is carried out with the help of SPSS and the Gini coefficient is derived for the measure of the consumer spending index. The performance measure from the analysis will help identify the areas for interventions and formulate a strategy for an infrastructure development plan to counter the challenges. The study will help us better understand that class-II and class-III cities will be the most numerically significant junction and the findings will help propose similar infrastructure development plans for other class-ii cities.

Keywords: Infrastructural development plan, class-II cities, Shajapur

TRACK-9: CIRCULAR ECONOMY OF THE GLOBAL SOUTH

How does a circular economy promote resource-efficient living? What are the policy approaches and business strategies to improve resource productivity and promote sustainable consumption? How can it create livable and resilient cities? What are the challenges and innovative solutions?

ASSESSING CIRCULAR ECONOMY POTENTIAL OF RECYCLABLE CONCRETE: A LCA APPROACH

Gokul Hari[1], Krithika Panicker[2]
[1]Studio AK, Dubai Silicon Oasis, Dubai, UAE
[2]Indian Institute of Technology Kharagpur, West Bengal, India

The production, construction and demolition process of concrete are major contributors of the increasing carbon dioxide emissions in the environment globally. The impacts of Construction and Demolition (C&D) waste increasingly cause grave environmental concerns. By boosting resource efficiency, the use of a circular economy as an approach is seen as a pertinent C&D waste management practice. In the Indian context, C&D waste accounts for 21.7% of Municipal Solid Waste, and almost 65% of this waste is attributed towards plain concrete. Since almost 60% of the stock of buildings projected to be present in 2030 is yet to be built in the country, sustainable construction and effective management of C&D waste assume even greater significance. With such a huge quantum of C&D waste of concrete, meager improvements have been explored in recycling recycled concrete. Hence, the need of the hour is to utilize this recycled concrete as an aggregate for the generation of recycled blocks. The current study presents a comparative study of the environmental impacts of recycled concrete block (RCB) manufactured from the failed cube test concrete in a documented production site vs. traditional concrete produced from the same site employing inputs such as raw materials, electricity consumption, and transportation. Comparison of the environmental impacts categories like global warming potential, freshwater aquatic eco-toxicity potential, marine aquatic eco-toxicity potential, ozone depletion potential, eutrophication potential, photochemical creation potential, acidification potential, and abiotic resource depletion potential has been conducted using the OpenLCA software employing the cradle to grave approach. The results of the study demonstrate that the primary energy demand for RCB (from renewable and non-renewable resources) is almost 50% lower than normal concrete blocks. Moreover, the Global Warming Potential of RCB is 33.3% lower than normal concrete blocks. The construction industry needs to undertake steps to reform and minimize the impact of waste generated and exploitation, and improper management of resources. The use of recycled concrete aggregate for cement production will greatly reduce the stress on limited natural resources, while also reducing greenhouse gas emissions due to the extraction process.

Keywords: Construction & Demolition Waste, Life Cycle Assessment, Recyclable Concrete, Life Cycle Assessment

ROLE OF AGRICULTURAL RESIDUE IN DEVELOPING RURAL LIVELIHOOD: A CASE OF ODISHA STATE

Maitrayee Nishideepa[1], Shrestha Das[2]
[1]Indian Institute of Engineering Science and Technology, Shibpur, West Bengal
[2]Odisha University of Technology and Research, Bhubaneswar, Odisha

Agriculture is the backbone of the rural economy. India produces more than 500 million tonnes of agricultural wastes annually due to its predominance in agriculture. Maize cobs, wheat straw, cotton husk, paddy husk, paddy straw, paddy stalks, banana residue, barley residue, and corn stalks and cobs are examples of residues.

The by-product, traditionally regarded as "waste" includes stalks, coconut shell, cotton husk, cotton stalks, cow gram stalks, maize cobs, maize stalks, sugarcane bagasse, etc. The best illustration of recycling and reusing is a "co-product" of grain production in which both the grain and the residue have substantial economic worth.

Agricultural waste is used for a variety of things, including animal feed, composting, energy production, the production of biofuel and bio-oil, building materials (bricks, plaster), bio-chemicals, biopharmaceuticals, fertilizers, bio-plastics, the production of leather and paper, sugar by-products, metal finishing, and packaging.

However, a significant amount of wasted agricultural waste is burned in the fields, mostly to remove the leftover straw and stubble after harvest. Crop residue burning depletes plants of their nutrients, pollutes the environment, poses a risk to human health, and creates greenhouse gases that contribute to global warming. The issue is worse in irrigated agriculture, especially in the northwest Indian mechanized rice-wheat system. Therefore, proper agricultural residue management becomes extremely important. Odisha is an agrarian economy with the 7th highest agricultural residue production amongst all the Indian states. Therefore the study will explore:

Firstly, the predominant crop production trends concerning crop residue generation have been analyzed.

Secondly, crop residue has been assessed as an ingredient for use and current application that can be locally relevant.

Thirdly, the generation of residue related to crop production and prospects of appropriate utilization.

Finally, an optimal spatial chain of crop-wise residue utilization has been proposed from the source to the consumer point.

Major crop kinds, crop output, different forms of residue production from each crop, present residue usage by farmers and industries, and case studies of companies are the data needed for the study. An ideal residue supply chain framework from source to consumption point is the research's output, which will help the rural economy. It is anticipated that the data produced by this study will be valuable to district administrators, farmers, manufacturers, agricultural colleges, working groups on bioconversions, etc., which would, in turn, have a good impact on the entire growth of the agriculture economy.

Keywords: Stubble burning, Residue reusage, Agro-waste, Economy generation

THE TRAVELLING IDEA OF CIRCULAR ECONOMY: "POLICY V/S PRACTICE" DISCOURSE ANALYSIS THROUGH MULTI- LEVEL PERSPECTIVE IN GLOBAL NORTH AND GLOBAL SOUTH

Sukanya Koner
University of Vienna, Austria

Circular Economy (CE) as a "go to concept" promises to address contemporary urban challenges while revitalizing local and regional economies, dissipating in the core urban developmental framework. This traveling idea has been openly criticized in academic discourses for having polarized technical and economic accountability while its uncertainty towards depoliticizing sustainable growth. The geographical policy mobility literature reveals the mutation of traveling policies but this traction of socio-spatial theorizing also helps in identifying the geographical problem of loss in translation of policies in the reflection of the global-local dualism. However, practice through initiatives at multi-level tends to stretch beyond a particular territory to construct, adopt or adapt any policy framework, mainly shaped according to the 'global' imagination of relational practices. The paper addresses the question- "What challenges are faced in the policy framing in Global South that tends to align according to the Global North imaginaries of similar practices?". The policy v/s practice discourse is analyzed through a multi-level perspective and compared within the countries of Global North (EU countries) and Global South (India, China, and Vietnam) to understand an overall panorama of the multi-dimensional complexity of changes in socio-technical systems by illustrating on three analytical levels: 1) Niches (Loci for transformational innovations), 2) socio-technical regimes (loci for stabilized practices coherent with rules, path-dependent), 3) the socio-technical ecosystem and landscape.

This research seeks to identify the success factors, core limitations, and challenges in the circularity approach from Global North and Global South perspectives. It takes inspiration from policy mobility to understand global-local imaginaries regarding many circular futures for the cross-pollination of practical and innovative solutions.

Keywords: Circular Economy, Multi-Level Perspective, Global North, Global South, Policy Mobility

TRACK-10: AFFORDABLE HOUSING AND WELL-BEING

How is affordable housing contributing to the well-being of people? Role of housing in promoting good physical and mental health? What are the impacts of poor housing on the well-being of people in cities? What are the innovative solutions to the problem?

EVALUATION OF THE UNEVEN OUTCOME OF PMAY-URBAN IN KOLKATA, WEST BENGAL

Debanjali Saha[1], Ruchita Gupta[2]
[1]Indian Institute of Technology, Kharagpur
[2]School of Planning and Architecture New Delhi

Rapid urbanization and migration have caused various urban-level issues, including the housing shortage and lower living standards. Housing affordability and demand from low-income households have not been coordinated with the formal housing supply. The introduction of the affordable housing initiative, Pradhan Mantri Awas Yojana (PMAY) "Housing for All" (Urban) in 2015, which is implemented via various programme verticals' is gaining the attention of the academicians in critically reviewing it. Although PMAY-U outshined previous central housing interventions, the outcomes of various programme verticals within PMAY-U have been vastly disproportionate in West Bengal. In West Bengal, only 1.90 lakh houses have been built, accounting for about 2.7% of the total 68.85 lakh houses sanctioned under PMAY. Two of the verticals, CLSS and BLC, which are demand-side schemes, account for 9.8% of the scheme uptake, while the other two, ISSR and AHP, are top-down supply-push schemes having difficulty taking off. Therefore, taking the case of the Kolkata Municipal Corporation in West Bengal, this study demonstrates the uneven outcomes of each vertical.

A qualitative approach was undertaken to understand the missing dimensions in the policy guidelines of individual verticals, which affected their performance. Analysis of each vertical led to identifying problems at the city, household, and policy levels. It was reported that in the first vertical, i.e. In-situ Slum Rehabilitation (ISSR), the unit size was too small to accommodate a large household size, making it difficult to obtain 70% consent. Similarly, in the third vertical Affordable Housing in Partnership (AHP), where the minimum township size is 50 acres as per the West Bengal Town and Country Planning Rules of 2008, the developers are choosing to build on a site that is less than 50 acres. Thus, under the AHP vertical, only four projects have been identified in Kolkata; however, none has been implemented. Even the infrastructure for the newly built sites appears problematic in several instances.

Therefore, this article provides a comprehensive solution that addresses the issues by outlining the challenges at various levels. The policy recommendations also include the changes/modifications required in the existing policy guidelines to increase its functional efficiency. The study provides a repository of the existing housing research in India for the benefit of present and future researchers. It provides a better direction for addressing problems at the state and city levels.

Keywords: Affordable, Housing Policy, India, Kolkata, PMAY-Urban

SCHOOL OF HUMAN SETTLEMENTS
XIM UNIVERSITY