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Research Horizons: Peer–Reviewed Journal
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FROM THE CHIEF EDITOR'S DESK

Navigating Interconnected Currents of Change

Welcome to this edition of our journal. As we survey the rich tapestry of research presented within these pages, a compelling, interconnected narrative emerges—one that captures the profound transformations reshaping our social, economic, and personal landscapes. This issue stands as a testament to the vitality of interdisciplinary inquiry, where the threads of commerce, economics, history, psychology, and gender studies weave together to form a more complete picture of our contemporary moment. At the heart of this collection lies a unifying theme: the human experience navigating, adapting to, and shaping waves of technological, economic, and social change.

The Commerce section immediately plunges us into the digital revolution's front lines. From Ms. Kinjal Patel's exploration of how WhatsApp and Instagram are forging new pathways for women's livelihoods, to Dr. Surajkumar Dubey's analysis of the behavioural shifts driven by 10-minute delivery platforms, we see technology fundamentally rewriting the rules of enterprise and consumption. These studies are beautifully complemented by investigations into the very infrastructure and risks of this new world: Dr. Hardik Majithia's SWOT analysis of AI in Accounting examines the systemic transformation of a foundational profession, while Dr. Vinod Kamble and Ms. Brahmi Suvarna's work on UPI fraud patterns reminds us that innovation is invariably shadowed by new vulnerabilities, challenging the very trust upon which digital economies depend.

This focus on systems and structures finds its macro-scale counterpart in our Economics research. Here, the lens widens to examine the forces shaping communities and nations. Papers on enhancing regional connectivity, rural migration as an engine of urban growth, and the geopolitical implications of the Belt and Road Initiative for energy security, illustrate the complex dance between policy, geography, and development. Crucially, this section is anchored by a forward-looking ethical imperative, embodied in studies on Sustainable Resource Management and the collaborative potential between the SDGs and NEP 2020. These works argue compellingly that growth and connectivity must be measured not just in GDP, but in resilience and equity.

It is precisely this human dimension—the lived experience within these vast systems—that our contributions in History, Psychology, and Women's Studies so powerfully illuminate. Manvika Shetty's historical study of mobile classrooms and knowledge networks in pre-modern South India offers a poignant reminder that our current debates over connectivity and learning have deep historical roots, providing crucial context for today's policies. Meanwhile, the psychological exploration of Generation Z balancing dating attitudes with Indian cultural values captures the intimate internal negotiations required in a globalized, digitally-mediated world.

Perhaps no piece synthesizes the journal's core themes more powerfully than Pavitra R's study on male sex workers during India's lockdown. This research, situated at the critical intersection of gender, labour, and crisis, lays bare the stark realities of marginalization. It connects directly to the commerce studies by examining a highly precarious form of livelihood; it echoes the economic papers by highlighting populations often excluded from formal growth narratives; and it delivers a profound human story of secrecy and survival. It stands as a crucial reminder that behind every systemic analysis are individuals navigating extraordinary challenges.

The articles in this issue engage in a compelling scholarly dialogue.. The historian's "mobility networks" converse with the economist's "regional connectivity." The psychologist's study of Gen Z attitudes finds its counterpart in the commerce researcher's analysis of Generation X's trust in digital payments. The focus on women's digital livelihoods finds a sobering parallel in the study of a stigmatized, predominantly male labour force. This is the strength of a multidisciplinary forum: it allows these echoes to be heard, fostering a richer, more nuanced understanding.

We extend our deepest gratitude to all the contributors for their rigorous scholarship and for choosing this platform to share their important work. To our readers—academics, policymakers, students, and practitioners—we present this collection not as a series of isolated findings, but as a constellation of insights. We invite you to draw your own connections, to find the links between the digital and the historical, the macroeconomic and the intimately personal. In doing so, we may better comprehend the multifaceted nature of the changes we are living through and contribute to building systems that are not only efficient and connected, but also inclusive, sustainable, and profoundly human.

Dr. Rajshree Trivedi,

Chief Editor,

Director, KSRC

Principal, MNWC

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FROM SENIOR EDITOR'S DESK

Dear Readers,



Happy New Year. We are quite thrilled to place before you the latest issue of Research Horizon.

The first section captures state of the art discourses on the contemporary concerns marked by technological revolution of social media, digital platforms and Artificial Intelligence dominating our day-to-day existential reality. While Kinjal Patel examines the contribution of social media such as WhatsApp and Instagram on businesses of women entrepreneurs in Urban India, Dr. Sukumar Dubey focuses on the influence of quick commerce on consumer behaviour. A comprehensive Success-Weakness-Opportunity-Threat (SWOT) Research based analysis of application of Artificial Intelligence (AI) in accounting practices is provided by Dr. Hardik Majithia. Dr. Vinod Kamble and Ms. Brahni Suvarna probe an alarming trend of Unified Payment Interface (UPI) fraud patterns involving social engineering and technical exploits, with common tactics including phishing (fake links/emails), vishing (fake bank calls), impersonation (fake customer support/sellers), malware (remote access/screen mirroring apps), and tricking users with fake payment requests, Quick Response (QR) codes, or cashback offers, all designed to steal your UPI Personal Identification Number (PIN), One Time Password (OTP), or banking credentials.

The 2nd section is dedicated to economics. Dr Moses Kachunda and Prof. Dr Ravinder Rena provide a macro analysis of pathways to enhancing regional connectivity for economic growth. The contribution of migrant workforce from the rural areas to the urban development of Navi Mumbai is captured in the article by Mr. Atul Krishna Ghadge. Dr. Manikandan Iyer makes an effort to evolve a collaborative approach between Sustainable Development Goals (SDGs) and National Education Policy (NEP) 2020. Ms. Ravneet Syan shows the trajectory of sustainable resource management. Mr. Deinma Emmanuel George's article deals with physical infrastructural issues while analysing the role of China Belt and Road Initiative in energy security in the Niger Delta.

Ms. Manvika Shetty provides a historical perspective on the mobile classrooms of South India and mobility networks and the transmission of Indian Knowledge Systems in the Pre-modern Period.

Collective research effort of Pandey N; Beddingwala A; Abdulhusein A; Kannan A; Datwani A; Sukheja I, Dr Ruchi Dubey Chaturvedi & Dr Freyana Shinde has resulted in an insightful outcome captured in the article, "Generation Z at Crossroads: Balancing Dating Attitudes Embedded in Indian Culture".

In gender studies, this number has chosen an article on the lived reality of male sex workers during COVID19 triggered lockdown in India by Pavitra M.

Research Horizon team requests you to contribute your research articles for this highly acclaimed annual publication, an outcome of intellectual energy derived from great knowledge of nationally and internationally renowned academicians who are on our Editorial Advisory Committee. We extend our heartfelt thanks to all contributors and peer-reviewers for their dedicated services for successful publication of Research Horizon, 2025.

Hope you will find new knowledge in the current issue of Research Horizon.

Prof. Vibhuti Patel,
Senior Editor

THE EDITORIAL BOARD

Chief Editor

Dr. Rajshree P. Trivedi is the Principal and Head, Department of English of Maniben Nanavati Women's College, Mumbai. Her research publications include more than ten books, nine chapters in edited books and many papers in international/national journals. She has been on the Editorial Advisory Board of a few international journals, indexed and enlisted with reputed databases. A research guide, referee and resource person at research forums, she has undertaken a couple of research projects in trans disciplinary studies.

Senior Editor

Dr. Vibhuti Patel retired as Professor, Advanced Centre for Women's Studies, School of Development Studies, Tata Institute of Social Sciences, Mumbai on 30-6-2020. She retired as Professor and Head of Economics Department of SNDT Women's University, Mumbai on 30-6-2017. She was Director, Post Graduate Studies and Research of SNDT Women's University from 2006-2012. Her areas of specialisation have been Gender Economics, Women's Studies, Development Studies, Human Rights, Social Movements and Gender Budgeting. She has authored Women's Challenges of the New Millennium (2002), co-authored Reaching for Half the Sky (1985), Indian Women Change and Challenge (1985) and Status Report for ICSSR- Critical Evaluation of Women's Studies Researches during 1947-1988 (1989). She is co-editor of a series of 15 volumes Empowering Women Worldwide. She has edited 2 books namely 'Discourse on Women and Empowerment' (2009) and 'Girls and Girlhoods at the Threshold of Youth and Gender' (2010). Her coedited book titled, 'Gendered Inequalities in Paid and Unpaid Work of Women in India' was published by Springer in 2022. She had been a member of various Expert Committees for IGNOU, Ministry of Science & Technology and NCERT (Delhi) during 2005-2014. She prepared a base paper on Gender for Mumbai Human Development Report, 2009, MMRDA Human Development Report (2017) and coauthored "Socioeconomics Status of Muslims in Maharashtra" for Maharashtra State Minority Commission, Government of Maharashtra, 2013. Currently she is Governing Board member of Women Power Connect, Indian Council of Basic Education, Maniben Nanavati College for Women, Anusandhan Trust, VACHA, Women's Research and Action Group, Institute of Community Organisation and Research in Mumbai, lakh in Vadodara and Area Networking and Development Initiatives (ANANDI) in Ahmedabad. She is also an Advisory Board Member

of Institute of Indian Culture (Mumbai). She is a member of the Internal Quality Assurance Committee of Maniben Nanavati College for Women and MD Shah Mahila College. She is a Chairperson of Board of Studies in Non-Formal Education of SNDT Women's University, Mumbai and member of Board of Studies of Sophia College (Sociology), Jaihind College (Economics, Foundations Course), Somaiya College (Education) and Nagindas Khandwala College (Economics) and College of Social Work (Social Work). She is also BOS member of Economics for University of Mumbai, North Maharashtra University, Jalgaon and Guwahati University and BOS Chairperson for Life Long Learning for SNDT Women's University. She is a member of the College Development Committee of Maniben Nanavati College for Women, Surajba College of Education, BMN College of Home Science for Women and SNDT College of Arts and SCB College of Commerce, Mumbai.

"Research is seeing what everybody else has seen and thinking what nobody else has thought"

- Albert Szent-Gyorgyi

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Dr. Poornima Madhavan (USA) is an Associate Professor, Dept. of Psychology at Old Dominion University (ODU) where she also holds affiliated faculty positions in the Virginia Modeling, Analysis and Simulation Centre (VMASC), the Climate Change and Sea Level Rise Initiative (CCSLRI), and the Homeland Security Research Group and Vision Lab. Currently, she is also the Director of the Undergraduate Research Program within the Honours College at ODU. She received her Ph.D in Human Factors (Engineering Psychology) from the Aviation Human Factors Division at the University of Illinois, Urbana Champaign. She was a Post Doctoral Fellow at Dynamic Decision Making Laboratory at Carnegie Mellon University. She has several publications in the form of books, book chapters, and research articles. She has been awarded for her achievements by American Psychological Association, US Dept. of Homeland Security, South Eastern Psychological Association and others.

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Dr. Saoko Funada is a lecturer of English at Fukuoka University, Japan. She earned a Ph.D. in English language and literature from Hiroshima University in 2012. Her main focus is on the study of Charles Dickens's figurative expressions such as metaphor, metonymy, and simile, by which the author mainly describes various people or substances vividly and humorously. She has investigated the linguistic mechanisms of these tropes from semantic and cognitive perspectives in order to highlight the correlation between the two references (i.e. the topic and the vehicle) included in his expressions.

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Dr. Kanya Padayachee is a research fellow at the University of the Free State, South Africa, in the Centre for Gender and Africa Studies. She holds a PhD in early childhood development with particular focus on holistic and integral education, African indigenous knowledge Ubuntu, social responsibility, participatory democracy, and community based participatory research. Kanya has a profound interest in honouring and harnessing the knowledge within communities and is a UNESCO Knowledge for Change (K4C) mentor and a K4C Southern Hub member. She has presented widely at international and local conferences on her areas of interest and PhD research and has published journal articles and contributed book chapters. She is often invited by local and international universities as an individual speaker and as a panel member to present on a range of socio-political and education issues. She also holds honours and master's degrees in English Literature.

Dr. Chitra Sinha is an academic based in Bahrain with interdisciplinary research and teaching experience in gender studies, history, political science, sociology, and humanities. She is currently a Visiting Faculty of Geopolitics at Vatel, Bahrain, a Senior Visiting Fellow at Impact and Policy Research Institute (IMPRI), a Fellow at New India Foundation, Bangalore, and a Member of the Advisory Board of Pakistan Gender Review Journal, Islamia University of Bahawalpur. Dr Sinha has been in academia for over three decades in India, Sweden, South Africa and Bahrain where she has been associated with different centres on gender studies and research. Apart from having a Ph.D. in History from University of Mumbai, India, she is Certified in International Law and Strategic HR Management. She has been a recipient of many fellowships in India, South Africa, and the US and has published many books.

Professor Ravinder Rena is a profound academician and distinguished scholar in economics, writer, editor, adviser, motivational speaker, and public intellectual with over 33 years of teaching and research experience in Asia-Pacific, Africa, and European continents. Prof Rena is currently working as a Professor of Economics, at Faculty of Management Sciences, Durban University of Technology (DUT), Durban, Republic of South Africa. He serves as an Adjunct Professor at the Department of Entrepreneurship and Business Management, Cape Peninsula University of Technology (CPUT), Cape Town, South Africa. He also serves as a Visiting Professor at the Academy of Engineering and Management, People's Friendship (RUDN) University, Moscow, Russia. He has bagged many awards and prizes, such as the prestigious Best Researcher Award from the Durban University of Technology in 2022 and in 2023 with a Gold medal. He is also one of the resource persons for the BRICS academic research forums/international conferences in Brazil, Russia, India, China and South Africa. He has published over 200 articles in peer reviewed reputed journals across the globe and over 80 chapters in edited books. He has been a Keynote Speaker/ Resource person for more than 400 national and international conferences in Europe, America, Africa, and the Asian continents.

Dr Gianluigi Segalerba graduated in Philosophy at the University of Pisa in 1991 and obtained his PhD in Philosophy at the University of Pisa in 1998. He was a visiting scholar at the Universities of Tübingen, Berne, and Vienna. He taught at the Institute of Philosophy of the University of Vienna. His first publication was Note su Ousia (Pisa 2001). He was then co-editor of the volume Substantia – Sic et Non (Frankfurt on the Main 2008), and he is the author of the book Semantik und Ontologie: Drei Studien zu Aristoteles (Berne 2013). His interests include Ancient Greek Philosophy, Spinoza, Indian Philosophy, Amartya Sen, Gandhi, and Jürgen Moltmann. He is a member of the IEF–Instituto de Estudos Filosóficos, Faculdade de Letras, Universidade de Coimbra, Portugal (IE–Institute for Philosophical Studies, Faculty of Arts and Humanities, University of Coimbra, Portugal).

Prof Linda Lane is a visiting Professor at IMPRI. Prof Lane is a native of the USA living in Sweden. She defended her doctoral thesis in Economic History titled, "Trying to make a living, the economic lives of Swedish women in the interwar years" in 2004 followed by post-doctoral studies at the Centre for Working Life Studies, London Metropolitan University, London. Since then, she has been employed as a Senior Lecturer at the Department of Social Work, University of Gothenburg, Sweden. Her research has focused on gender and intersectionality theory as analytical tools to study empowerment, work and employment, and social policy. Published research includes studies of work, family, and quality of life, disability, sexual harassment prevention, gender equality and gender empowerment. Since 2012, She has actively engaged in establishing research contacts with Indian researchers. These initiatives have led to several publications in Indian and European academic journals. Affiliations of interest are NGO Gender in Development (GADIP), Research Group on Gender-based Violence (KRV) at the University of Gothenburg, and resource person for Impact and Policy Research Institute (IMPRI), New Delhi. She is also a member of ed. Advisory Board for the journal Urdhava Mula.

National

Prof. S. John Michael Raj is a retired professor of Psychology from the Department of Psychology, Bharathiar University, Coimbatore. He guides doctoral students in the field of Motivational Dynamics, Personality Orientation, Well-Being, Cyber Psychology, Counseling Psychology and the Psychology of Marriage. He has served as Sectional President, Anthropological and Behavioral Sciences of the Indian Science Congress Association. He has also offered his expertise in the area of Pre-Marital Discourse at the Diocese of Coimbatore.

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published by Taylor & Francis. He has presented widely at national and international conferences. Recognized for his scholarly contributions, he has received several awards, including the Amity Excellence Award and the Prof. Deepak Bhat Award for Best Paper Presentation. Prof. Thakre also serves on the Board of Studies in Psychology at several universities and colleges.

Dr. Lata Pujari serves as the Coordinator of the Sophia Irene Heredia Centre for Women's Studies and Development and as a faculty member in the Department of History at Sophia College for Women, Mumbai. She has played a vital role in institutional development through research, curriculum design, training, awareness programmes, and national and international networking. She has served as Executive Editor of the interdisciplinary journal Urdhva Mula for over 15 years. Her published doctoral research on Women in the Vijayanagara period and her role as a Research Assistant on the ICSSR-funded major research project (2018-2020) demonstrate her expertise in gendered historical, mythological, and socio-cultural analysis.

Dr. Vina Vaswani is a pioneering force in bioethics and forensic medicine with a career spanning over two decades. As the founding Director of the Centre for Ethics at Yenepoya (deemed to be University), she has been instrumental in bridging gaps in ethics education, practice, and research. She holds an MD in Forensic Medicine and multiple advanced degrees, including an Erasmus Mundus Master in Bioethics and a PhD from Dublin City University, Ireland. She has global collaborations with institutions in Germany, the USA, Turkey, and Australia. Dr Vina is the Principal Investigator of the first NIH-funded Fogarty International Research Ethics Master's Program in India. Recognized widely for her contributions, she serves as a member of the Board of Directors of the International Association of Bioethics and holds key advisory positions in ethics and medical regulation. She has made influential publications on ethical challenges in clinical decision-making, surrogacy, and human infection model studies.

Dr. Khevana Desai is a distinguished sociologist and gender scholar, currently serving as a Vice-Principal and former head at Sociology Department at Mithibai College, Mumbai. With a PhD in declining child sex ratios and specialized training in feminist research, LGBTQ+ rights, and inclusive education, her work spans academia, policy, and grassroots activism. She has led impactful projects on women's sanitation access, COVID-19's gendered economic fallout, and menstrual equity. She has two edited books and more than 20 journal articles and book chapters to her credit including publishing with Routledge, Springer and many UGC care listed peer reviewers journals. A dynamic educator, she designs gender curricula, trains institutions on POSH compliance, and advocates for marginalized communities through initiatives like ROAR (against gender-based violence) and associations like Vacha- resource center. As a poet, lyricist, and folk dancer, she also bridges art and activism, editing feminist Gujarati literature and choreographing performances to challenge social norms. Recognized by IAWS and ISS, Dr. Desai merges rigorous scholarship with transformative advocacy.

INDEX

Sr. No.	Title of the Paper	Author	Page No.
	Commerce		
1.	Women's Livelihoods in the Digital Economy : Whatsapp and Instagram Business Practices among Urban Women	Kinjal Patel	1 – 19
2.	Living with 10-Minute Delivery: How Quick Commerce is Reshaping Consumer Behaviour in Urban India	Surajkumar Dubey	20 – 35
3.	AI in Accounting: A Comprehensive SWOT Analysis	Hardik Majithia	36 – 46
4.	An Analytical Study of UPI Fraud Patterns and Their Impact on Trust and Usage Behaviour among Generation X Users in Mumbai	Vinod H. Kamble Brahmi Suvarna	47 – 61
	Economics		
5.	Enhancing Regional Connectivity and Economic Growth through Infrastructure Development in Southern Africa - A Case of Maputo Corridor	Moses Kachunda, Ravinder Rena	62 – 77
6.	Rural Migration as the Silent Engine of Urban Growth with the special reference to Navi Mumbai	Atul Krishna Ghadge	78 – 91
7.	Sustainable Development Goals (SDG's) and National Education Policy (NEP 2020): A Collaborative Approach	Manikandan Iyer	92 – 112
8.	A Critical Evaluation of Sustainable Resource Management and Economic Policy Interventions in Addressing Environmental Degradation in India	Ravneet Syan	113 – 127
9.	The Role of China Belt and Road Initiative in Energy Security in The Niger-Delta	Deinma Emmanuel George, Ravinder Rena	128 – 145

INDEX

Sr. No.	Title of the Paper	Author	Page No.
	History		
10.	Mobile Classrooms of South India: Mobility Networks and the Transmission of Indian Knowledge Systems in the Premodern Period	Manvika Shetty	144 – 152
	Psychology		
11.	Generation Z at Crossroads: Balancing Dating Attitudes Embedded in Indian Culture	Pandey. N; Beddingwala. A; Abdulhusein. A; Kannan. A; Datwani. A; Sukheja. I, Ruchi Dubey Chaturvedi & Freyana Shinde	153 – 170
	Women's Studies		
12.	Sex Work, Secrecy and Survival: Male Sex Workers' Lived Realities amid India's Lockdown	Pavitra R.; Kamalaveni	171 – 180

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Women's Livelihoods in the Digital Economy: WhatsApp and Instagram Business Practices among Urban Women

Ms. Kinjal Patel*

Abstract

Digital platforms are transforming the entrepreneurial landscape in Indian cities, particularly for urban women. The widespread adoptions of smartphones, affordable internet access, and improved digital literacy have empowered women to launch and grow micro- and small-scale businesses using platforms such as WhatsApp and Instagram. These digital tools offer flexible work environments that accommodate women's household responsibilities while opening up access to expansive urban markets. Today, urban women leverage these platforms to operate a variety of online ventures, including home bakeries, clothing boutiques, fitness and beauty services, handmade products, art commissions, and subscription-based wellness plans. Instagram's visually driven, trend-focused culture combined with WhatsApp's community-oriented, trust-based communication creates a robust ecosystem for female entrepreneurship. This study aims to examine the impact of these digital platforms on the economic, personal, and social dimensions of urban women entrepreneurs' lives.

Keywords: **Digital Platforms, WhatApp, Instagram, urban women empowerment**

Introduction

Digital platforms are crucial resources for entrepreneurship in urban India, particularly for women in search of flexible and home-based income options. As access to smartphones, budget-friendly internet, and social media skills grows, women in urban areas are utilizing platforms such as WhatsApp and Instagram to launch and grow small enterprises. These platforms offer affordable marketing, direct interaction with consumers, and access to wider urban markets without requiring physical storefronts or significant capital investment. (IAMAI 2022; GSMA 2021; Meit Y 2023)

Urban India has experienced considerable digital change in the last ten years, with social media emerging as a key platform for communication, marketing, and commerce. Urban women—who frequently juggle career goals and home duties—view digital entrepreneurship as appealing because of its flexibility, low investment needs, and opportunities for creative expression. (NASSCOM 2021; Duffy 2017; Banerjee & Raghunathan 2020)

Consequently, WhatsApp and Instagram have become significant facilitators of income generation, financial independence, and personal empowerment for women in urban areas. Nonetheless, factors like digital rivalry, reliance on algorithms, cybersecurity threats, and the demand for continuous online presence also affect women's experiences. This research examines the influence of these platforms on the livelihood strategies of urban women as well as the economic and social results of their digital entrepreneurship. (Meta 2022; Kuehn & Corrigan 2013; UN Women 2020)

Urban women have increasingly turned to WhatsApp and Instagram to sell products, offer services, and maintain customer relationships. These platforms enable women to bypass certain barriers associated with physical marketplaces, such as high rental costs, mobility constraints, and gendered harassment in public spaces. At the same time, platform dependence introduces new vulnerabilities, including algorithmic visibility, unpaid digital labour, data surveillance, and the precarity of platform governance. Understanding how women navigate these dynamics is crucial for developing a nuanced account of livelihoods in the digital economy (Rosenblat 2018; Scholz 2016; Graham, Hjorth & Lehdonvirta 2017).

WhatsApp allows tailored selling via community groups, broadcast lists, and direct messaging, making it perfect for home-based businesses like home-baking, selling clothes, beauty services, and handmade products. Instagram's visual charm, hashtags, reels, and business tools enable women to create brands, gain followers, and access broader local and even national markets.

Even with these opportunities, urban women encounter obstacles like limited advanced digital marketing skills, concerns about online safety, competitive digital landscapes, and alterations in platform algorithms that impact visibility and sales. Comprehending how urban women manage these opportunities and hurdles is crucial for fostering inclusive digital entrepreneurship and enhancing women's economic empowerment in India's swiftly changing digital economy.

Another critical dimension of women's platform-based livelihoods is the role of social capital. Trust, reputation, and personal relationships are central to transactions conducted via WhatsApp and Instagram. Women often rely on existing networks—friends, family, neighbourhood groups—to establish customer bases. Over time, they may expand to broader audiences, but social validation remains crucial. Likes, shares, comments, and testimonials

function as forms of symbolic capital that influence economic outcomes. However, building and maintaining social capital requires continuous engagement, responsiveness, and emotional labour, which are rarely acknowledged as work. (Bourdieu 1986; Hochschild 1983; Baym 2015)

Urban women face different realities compared to rural women. While they generally have better access to education and technology, they still encounter:

- Work–family balance pressure
- Gendered expectations
- Limited formal job opportunities
- Workplace discrimination
- Safety concerns

Digital platforms offer them alternative income pathways by enabling work-from-home entrepreneurship and digital visibility. Instagram helps women create brands, reach niche markets, and participate in influencer culture. WhatsApp supports hyperlocal sales, repeat customers, and trust-based networks. (NSSO 2019; World Bank 2020; Abidin 2016)

Despite these opportunities, challenges persist—algorithm dependency, digital competition, time management, cyber harassment, content fatigue, financial management issues, and the need for stronger digital marketing skills.

How WhatsApp Helps Urban Women in Business

WhatsApp is one of the most accessible and widely used digital platforms among urban women. Its simplicity, low data consumption, and familiarity make it a powerful tool for small-scale urban entrepreneurship. WhatsApp is primarily used as a communication application, yet it plays a crucial role in facilitating business transactions. Urban women entrepreneurs use WhatsApp to advertise products through status updates, manage customer inquiries via direct messages, coordinate orders, negotiate prices, and arrange payments and deliveries. Features such as groups and broadcast lists allow sellers to reach multiple customers simultaneously, often within trusted social networks such as neighbourhoods, workplaces, or community groups. The private and personalized nature of WhatsApp

communication helps build trust and long-term customer relationships, which are essential for sustaining small-scale businesses. As a result, WhatsApp functions as a key infrastructural platform for informal commerce, blurring the boundaries between social interaction and economic exchange. (Donner 2015; Nandini & Srinivasan 2021; WhatsApp Business Documentation)

WhatsApp Strategies

- Direct communication with customers
- Marketing via status updates
- Sales through groups and broadcast lists
- Quick and secure digital payments
- Low-cost, home-based business operations
- Flexible work-from-home opportunities
- Builds customer trust and loyalty

How Instagram Helps Urban Women in Business

Instagram is a highly visual platform that supports branding, wide reach, and creative entrepreneurship—especially important in urban markets. Instagram, on the other hand, provides a more public and visually oriented platform for business practices. Urban women use Instagram to showcase products, build brand identities, and attract wider audiences beyond their immediate social circles. Through posts, stories, reels, and hashtags, women entrepreneurs engage in visual marketing and storytelling to enhance visibility and appeal. Instagram's emphasis on aesthetics and engagement encourages sellers to curate content carefully, transforming everyday products and services into aspirational commodities. For many women, Instagram serves as a digital storefront where visibility, follower counts, and engagement metrics directly influence business success.

Instagram

- Visual branding through photos, reels, and stories
- Access to wider urban and national audiences
- Product promotion using hashtags and explore page
- Instagram shops and business tools (catalogues, insights)
- Opportunities for influencer marketing and collaborations
- Community building and customer engagement
- Encourages creativity and professional networking

Despite their growing economic significance, business practices conducted through WhatsApp and Instagram are often excluded from formal definitions of employment and entrepreneurship. As a result, women engaged in platform-based businesses frequently lack access to social protection, institutional support, and policy recognition. Examining how urban women use these platforms is therefore essential for understanding the changing nature of work in the digital economy and for developing more inclusive approaches to digital economic development. (Abidin 2016; Marwick 2015; Khamis, Ang & Welling 2017).

By focusing on WhatsApp and Instagram as business platforms, this study highlights how everyday digital practices shape women's livelihoods in urban settings. It demonstrates that while these platforms create new opportunities for income generation and autonomy, they also reproduce gendered forms of labour, precarity, and platform dependency. A critical analysis of WhatsApp and Instagram use thus provides important insights into the complexities of women's participation in the digital economy.

Review of Literature

Laskar & Laskar's (2025) study Investigating the Social Media Marketing Environment for Women Entrepreneurs is a quantitative research, published in the International Journal of Research in Marketing Management and Sales, and examined 215 female entrepreneurs in Guwahati, Assam

Sowmya & Pai's (2025) study Women Entrepreneurs in the Unorganized Sector: A Systematic Review on Digital Inclusion is a systematic review in Advances in Consumer Research and explores the impact of digital inclusion via mobile banking, social commerce, and e-commerce on women entrepreneurs in India's unorganized sector. The authors highlight enduring obstacles—like digital skills, socio-cultural constraints, and infrastructural issues—despite platforms such as WhatsApp and Instagram creating new possibilities.

Singh et al. (2024) published The Impact of Social Media on Empowering Women Entrepreneurs in India in the American Journal of Psychiatric Rehabilitation. This study examines how social media sites assist female entrepreneurs in navigating patriarchal barriers, establishing networks, and maintaining businesses. They emphasize that visibility, brand development, and customer interaction through platforms such as WhatsApp and Instagram increase women's economic involvement and societal acknowledgment.

De's (2024) study, An Examination of WhatsApp for Business Infrastructure in India, employs discourse analysis to explore the infrastructuring of WhatsApp for Business in India, focusing on the impact of Meta's monetization and formalization on small users. The research reveals conflicts: although WhatsApp is extensively utilized by marginalized entrepreneurs, the introduction of newer paid or advanced features may alienate these users or lead to feelings of marginalization. A subsequent working paper by De (2025) named "Business on WhatsApp is hard now—but am I truly a businesswoman?" assesses how small business owners are adapting to WhatsApp's latest professional features and feeling pressured toward formalization.

BFA Global (as cited in World Bank Summary, 2024) reports that high rates of WhatsApp and Instagram use among women entrepreneurs translate into business use, with WhatsApp adoption rates among women entrepreneurs particularly high due to its ease of use and direct communication features. While this points to a broad engagement with social platforms, the same research also notes issues such as online harassment and platform safety concerns that can constrain women's digital participation

Neog (2022) published The Influence of Social Media on Women's Empowerment in the International Education and Research Journal. Neog's study examines how platforms like Instagram, WhatsApp, and Facebook enable women by providing avenues for self-expression, economic opportunities, and social transformation.

Agrawal's (2021) study, Utilization of Social Media by Small Women Entrepreneurs in India, published in the SMS Journal of Entrepreneurship & Innovation, examines how women entrepreneurs in India utilize social media—including WhatsApp, Instagram, Twitter—to expand their businesses. The study indicates that WhatsApp is mainly utilized for customer communication and order management, whereas Instagram aids in displaying products and enhancing brand identity. Agrawal also notes that heightened smartphone usage among women greatly aids in their embracing social media for business purposes.

Bagdare's (2021) article WhatsApp's Function as a Marketing Resource for Female Entrepreneurs published in SAJMMR (South Asian Journal of Marketing & Management Research), claims that WhatsApp serves as an incredibly efficient and accessible marketing resource for micro-level female entrepreneurs in urban and rural settings across India. She suggests a strategic plan to improve WhatsApp marketing efficiency tailored for women, emphasizing aspects such as group messaging, broadcast lists, and status updates.

Objectives of Study

1. To examine how WhatsApp and Instagram are used by urban women for business communication, marketing, and sales.
2. To understand the benefits of these digital platforms on income generation, customer engagement, and professional identity.
3. To identify challenges and barriers urban women face while using these platforms for business.
4. To provide recommendations for improving digital support for women entrepreneurs.

Research Methodology

The study adopts a descriptive and exploratory research design to examine how WhatsApp and Instagram contribute to the livelihood strategies of urban women entrepreneurs. The research focuses on understanding platform usage patterns, benefits, challenges, and the socio-economic impact of digital entrepreneurship among urban women.

Area of Study

The study is confined to urban areas of Mumbai, including locations such as Andheri, Bandra, Malad, Vile Parle, and nearby urban localities, where digital platform usage among women entrepreneurs is prominent.

Sample Selection

The sample consists of urban women entrepreneurs who use WhatsApp and/or Instagram as primary platforms for conducting business activities.

- **Sampling Technique:** Purposive sampling
- **Sample Size:** 6 to 7 women entrepreneurs (including detailed case studies)
- **Nature of Businesses:** Handmade products, food services, fashion reselling, beauty services, home décor, and lifestyle products

Data Collection Methods

Data were collected using the following methods:

- Semi-structured interviews with selected women entrepreneurs to understand business practices, platform benefits, challenges, and personal experiences
- Case study analysis of selected women-led businesses operating on WhatsApp and Instagram

Case Study

Case 1: Priya Sharma–Handmade Jewelry Entrepreneur

Background

- Age: 32, lives in Andheri, Mumbai.
- Started handmade jewelry business from home in 2021.

Digital Platform Usage

WhatsApp.

- Maintains a digital product catalog with clear pricing and descriptions.
- Uses automated greeting messages and quick replies to manage customer inquiries efficiently.
- Confirms orders through one-to-one chats, discussing:
- Customization options
- Delivery timelines
- Payment methods
- Uses WhatsApp Status for:
- Daily updates on new designs
- Festive offers
- Customer testimonials

Instagram.

- Posts high-quality product photographs regularly.
- Shares short reels showcasing the jewellery-making process.
- Uses stories to highlight:
- New collections
- Customer reviews
- Uses hashtags related to handmade jewellery, fashion, and local markets to improve reach.
- Includes a "Click to WhatsApp" link in bio for direct customer orders.

Benefits

- Expanded customer base across Mumbai and other cities.
- Monthly income grew from ¹ 5,000 to ¹ 35,000.
- Gained confidence and social recognition.

Challenges

- Managing multiple orders simultaneously.
- Limited knowledge of Instagram ads and analytics.

Case 2: Ananya Deshmukh–Organic Homemade Food Entrepreneur

Background

- Age: 28, from Bandra, Mumbai.
- Sells homemade organic snacks and healthy food products.

Digital Platform Usage

WhatsApp.

- Maintains a digital menu catalog with daily or weekly offerings.
- Uses broadcast lists to send updates about fresh batches, combos, or festival specials to loyal customers.
- Handles order placement, payment confirmations, and delivery coordination.
- Shares images, recipe snippets, and customer testimonials to increase trust.
- Sends reminders and follow-ups to ensure repeat orders and timely payments.

Instagram.

- Posts high-quality photos of food products, emphasizing organic ingredients and freshness.

- Creates short cooking videos and reels to demonstrate the preparation process and showcase hygiene standards.
- Uses Instagram stories to run polls, ask for flavor preferences, or announce discounts.
- Engages customers via DMs, then directs them to WhatsApp for placing orders and secure transactions.
- Leverages hashtags like #OrganicFood, #HealthySnacks, and #HomeChefMumbai to reach a wider audience.

Benefits

- Developed a loyal customer base within Mumbai.
- Earned financial independence and recognition in local communities.

Challenges

- Delivery logistics during peak orders.
- Occasional delayed payments via online methods.
- Balancing production time with order volume, especially for customized healthy meals.

Case 3: Sunita Rao–Fashion and Clothing Reseller

Background

- Age: 35, lives in Andheri East.
- Resells trendy fashion clothing and accessories online.

Digital Platform Usage

WhatsApp.

- Uses broadcast messages to inform regular customers about new arrivals and special discounts.
- Handles customer queries regarding sizing, colour options, and stock availability.

- Maintains records of orders, delivery addresses, and payment confirmations through chat.
- Shares personalized product recommendations based on previous purchases.

Instagram.

- Posts reels and videos demonstrating styling tips with the products she sells.
- Shares carousel posts showcasing multiple outfit combinations or accessory sets.
- Maintains story highlights for categories such as "New Arrivals," "Best Sellers," and "Customer Reviews."
- Collaborates occasionally with micro-influencers or other resellers for giveaways or joint promotions.
- Uses Instagram shopping features for tagged products, though most transactions are finalized via WhatsApp to maintain personal control over orders

Benefits

- Instagram followers grew to 10,000+ in 1 year.
- Monthly income increased from ¹ 10,000 to ¹ 50,000.

Challenges

- High competition on Instagram makes it difficult to maintain visibility.
- Ensuring customer trust for payments and delivery, especially for first-time buyers.
- Constant content creation demands, including photography and styling posts.

Case 4: Meera Nair–Beauty and Skincare Services

Background

- Age: 30, from Vile Parle, Mumbai.
- Provides home-based beauty services such as facials, skincare, and grooming.

Digital Platform Usage

WhatsApp.

- Uses WhatsApp for appointment booking, reminders, and follow-ups.
- Maintains a client database with treatment history, preferences, and special dates for offers.
- Sends personalized messages for loyalty discounts or promotional packages.
- Shares before-and-after photos (with client consent) to build credibility and encourage referrals.

Instagram.

- Posts before-after transformations to demonstrate the effectiveness of her services.
- Shares short reels with skincare tips, DIY routines, and product demonstrations.
- Uses Instagram stories for client testimonials and to promote special offers.
- Engages potential clients via DMs before transitioning to WhatsApp for final bookings and payments.
- Uses hashtags such as #SkincareMumbai, #HomeBeautyServices, and #GlowUp to attract urban clientele

Benefits

- Expanded clientele beyond her local neighborhood.
- Instagram enhanced her professional credibility.

Challenges

- Managing multiple appointments daily, especially during weekends or festive seasons.
- Limited ability to use Instagram analytics to optimize content and marketing strategies.
- Balancing personal time with client needs, given the flexible yet demanding nature of her work.

Case 5: Ritu Kapoor–Handmade Home Decor Entrepreneur

Background

- Age: 33, lives in Malad, Mumbai.
- Creates decorative home items and crafts for urban households.

Digital Platform Usage

WhatsApp.

- Shares product catalogs with photos and pricing, often targeting bulk buyers like small shops or interior decorators.
- Handles direct inquiries, order negotiations, and payment follow-ups through one-to-one chats.
- Uses WhatsApp Status to post weekly updates, festive collections, and limited-edition items.
- Communicates with craft suppliers for raw materials and coordinates delivery logistics with local couriers.

Instagram.

- Posts high-quality photos and reels showcasing the creation process, from raw materials to finished decor pieces.
- Uses story highlights to categorize products, showcase client testimonials, and display past work.
- Engages followers through interactive stories (polls, questions, and "this or that" comparisons for designs).
- Collaborates occasionally with interior influencers for features and promotions.
- Maintains a consistent posting schedule to maximize reach and follower engagement.

Benefits

- Monthly income increased from ¹ 8,000 to ¹ 40,000.
- Built a strong online presence and repeat customer network.

Challenges

- Handling large orders and packaging logistics, particularly during festive or wedding seasons.
- Limited digital marketing knowledge for targeted advertising or expanding audience reach.
- Dependence on WhatsApp and Instagram algorithms, which can affect visibility and customer engagement.

Examples of Instagram Business Practices

1. @jugnee_by_vallari
   a. *Business:* Handmade jewellery & accessories.
   b. *Location:* Mumbai/Jaipur. Jugnee by Vallari specializes in custom bridal jewellery and luxury handcrafted pieces.
   c. *Instagram Role:* Uses visually rich posts (jewellery pics, reels) to showcase designs, connect with customers, and take orders.
2. @thegourmetjar
   a. *Business:* Gourmet food products (spreads, dips, sauces).
   b. *Founder:* Apeksha Jain (Instagram: @jainapeksha) runs it from her kitchen.
   c. *Instagram Role:* Uses her personal + business Instagram to share recipes, behind-the-scenes content, and product promos.
3. @namakwali
   a. *Business:* Himalayan flavored salts (pisyu loon) and natural products.

b. *Founder:* Shashi Bahuguna Raturi.

c. *Social Impact:* Her business helps rural/mountain women artisans.

d. *Instagram Role:* Shares heritage recipes, product stories, and women-artisan empowerment narratives.

4. @sunkissed_jewellery13

a. *Business:* Handmade fusion jewellery.

b. *Location:* Mumbai-based small business.

c. *Instagram Role:* Posts their handcrafted designs, which are likely marketed to local and online customers.

5. @malikagupta_label

a. *Business:* Fashion/Boutique label.

b. *Designer:* Malika Gupta.

c. *Instagram Role:* Uses IG for lookbooks, new collections, and customer engagement.

Conclusion

The study emphasizes the significant influence of digital platforms, especially WhatsApp and Instagram, in impacting the lives of urban female entrepreneurs. The examination of various cases from Mumbai reveals that these platforms function not only as communication tools but also as strategic facilitators for business expansion, customer interaction, and individual empowerment.

Women in urban areas utilized WhatsApp Business to simplify order handling, engage directly with customers, and keep product listings updated, while Instagram enabled them to promote their products, establish a brand presence, and connect with a larger audience outside their local area. In every instance, utilizing these platforms led to higher earnings, greater professional acknowledgment, and boosted self-assurance among women entrepreneurs.

Nonetheless, the research also uncovered ongoing difficulties. Numerous women encountered challenges in juggling various orders, handling digital marketing tactics, guaranteeing online payment safety, and maintaining customer confidence. These obstacles show that although digital platforms provide considerable opportunities, there is an essential requirement for capacity-building, digital literacy education, and supportive policies to enhance the advantages for women-led small enterprises.

In summary, the results highlight the ability of digitalization to economically and socially uplift marginalized women in urban areas. WhatsApp and Instagram act as both business resources and platforms for social interaction, skill development, and entrepreneurial exposure. By tackling obstacles and offering focused assistance, policymakers, NGOs, and platform creators can enhance the effectiveness of digital platforms in supporting women's economic activities in urban India.

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Living with 10-Minute Delivery: How Quick Commerce is Reshaping Consumer Behaviour in Urban India

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Abstract

The rapid expansion of quick commerce platforms offering 10-minute deliveries has subtly but significantly altered everyday consumption in urban India. What initially emerged as a time-saving convenience has evolved into a system that reshapes shopping habits, spending behaviour, and perceptions of immediacy. Existing studies have predominantly examined operational efficiency and customer satisfaction; however, this chapter shifts the focus toward deeper behavioural outcomes associated with ultra-fast delivery models. Using primary data from a structured quantitative survey of 400 urban consumers, the study investigates both the advantages and unintended behavioural consequences of instant commerce. Results indicate that convenience, time efficiency, ease of access, and broad product availability are the strongest drivers of adoption and repeat usage. At the same time, these benefits are accompanied by behavioural risks that remain insufficiently addressed in prior research. High usage frequency is associated with increased impulse purchases, over-consumption, and a steady rise in household expenditure. Many respondents reported post-purchase regret, app fatigue, and growing reliance on delivery platforms, pointing toward emerging patterns of convenience dependency. Service shortcomings, including delivery inaccuracies, product substitutions, and inconsistent quality, further widen expectation–performance gaps. The study also finds that consumers consciously tolerate higher prices in exchange for speed, signaling a shift in value perception rather than heightened price sensitivity. Additionally, quick commerce usage is linked to lifestyle adjustments such as heightened time pressure and fewer visits to neighborhood stores. By adopting a customer centered lens, this chapter offers a nuanced understanding of how instant delivery is redefining urban consumption, with meaningful implications.

Keywords: **Quick Commerce, Consumer Behaviour, Impulse Buying, Convenience Dependency, Urban Consumption**

Introduction: The Rise of Instant Consumption

Over the past few years, quick commerce, defined by the promise of delivering daily essentials within ten minutes, has rapidly become a prominent feature of urban retail in India. What initially catered to urgent or last-minute needs has now evolved into a routine shopping option for urban consumers, particularly in metropolitan cities such as Mumbai, Delhi, Bengaluru, and Hyderabad. Industry evidence suggests that a significant proportion of urban households increasingly rely on quick commerce platforms either for regular grocery purchases or for frequent replenishment of daily-use items, indicating a visible transformation in consumption routines. This development reflects a fundamental shift away from conventional, planned shopping practices. Earlier, consumers typically scheduled weekly or monthly visits to local markets or supermarkets. In contrast, quick commerce encourages spontaneous, need-based purchases enabled by speed and ease. The growth of hyperlocal dark stores, advanced inventory technologies, and seamless digital payment systems has made ultra-fast delivery operationally feasible, embedding immediacy into everyday consumption.

However, quick commerce represents more than an advancement in logistics efficiency. It is reshaping how urban consumers perceive time, effort, and value in purchasing decisions. What was once considered a premium or emergency service is now frequently used for ordinary, low-value items. This growing dependence on instant fulfilment raises important behavioural questions related to impulse buying, habitual overuse, and the willingness to accept higher prices in exchange for speed areas that remain insufficiently examined in existing e-commerce research. Most prior studies have concentrated on service quality and customer satisfaction, leaving a gap in understanding how ultra-fast delivery influences long-term consumer behaviour. This chapter addresses this gap by examining whether instant delivery alters spending habits, decision-making patterns, and consumption discipline. Using primary data from a quantitative survey of 400 urban quick commerce users, the chapter offers a balanced assessment of both the benefits and the behavioural costs associated with living in an era of instant delivery.

Conceptual Background and Review of Related Studies

Quick commerce (Q-commerce) has emerged as a distinct segment within the e-commerce ecosystem, characterized by ultra-fast delivery of daily essentials such as groceries, packaged foods, and personal care items, often within 10–30 minutes. Unlike traditional e-

commerce, which emphasizes broader product range and longer delivery windows, Q-commerce relies on hyperlocal fulfillment centers (dark stores), advanced inventory management systems, and real-time logistics tracking to enable immediate delivery. Its distinguishing features include rapid fulfilment, high convenience, round-the-clock accessibility, and integration with digital payment systems (Arora, 2024; Nexdigm, 2025).

From a consumer behaviour perspective, Q-commerce aligns closely with theories of instant gratification and convenience orientation. The concept of instant gratification posits that consumers derive immediate emotional satisfaction from prompt fulfilment, which reinforces repeated purchases and may create habitual behaviour. The Stimulus–Organism–Response (S-O-R) model has also been applied in online retail contexts to explain impulse buying, where stimuli such as time pressure, ease of ordering, and rapid delivery trigger emotional responses leading to unplanned purchases (Chavadi et al., 2024).

Existing studies on e-commerce largely focus on customer satisfaction, service quality, and loyalty, highlighting the role of delivery reliability, product quality, and app usability in shaping repeat purchase intentions (Banerjee & Upadhyay, 2025; Nair et al., 2025). While these studies confirm the attractiveness of fast delivery, they maintain a service-centric lens, with limited attention to behavioural outcomes such as dependency, impulse buying, post-purchase regret, or the trade-offs consumers make for speed.

This gap is significant, as repeated engagement with Q-commerce platforms may alter consumption patterns, spending habits, and lifestyle choices. The present study positions itself within this under-researched domain by exploring both the merits and emerging behavioural risks of ultra-fast delivery, focusing exclusively on urban consumer perspectives. By integrating concepts of convenience, instant gratification, and behavioural psychology, the study aims to provide a holistic understanding of how 10-minute delivery reshapes consumer behaviour in India.

Research Objectives, Scope, and Hypothesis of the Study

1. To understand the impact of quick commerce on urban consumer behaviour beyond service satisfaction.

2. To examine perceived merits such as convenience, time saving, accessibility, and product availability.

3. To analyse emerging behavioural risks including impulse buying, dependency, and post-purchase regret.

4. To assess the effect of quick commerce usage on household spending patterns.

5. To study lifestyle changes such as reduced planned purchasing and fewer visits to physical stores.

6. To capture consumer expectations and trade-offs between delivery speed, price, and service quality.

Research Hypotheses

H1: Convenience and time-saving benefits have a significant positive influence on the frequency of quick commerce usage among urban consumers.

H2: Frequent use of quick commerce platforms significantly increases impulse buying behaviour and unplanned purchases.

H3: Higher reliance on quick commerce services is positively associated with increased household spending.

H4: Behavioural dependency on quick commerce platforms significantly contributes to post-purchase regret among consumers.

H5: Consumers are willing to accept higher prices as a trade-off for faster delivery speed.

H6: Service inconsistencies (delivery errors and product substitutions) significantly affect expectation–performance gaps in quick commerce usage.

Research Methodology

This study uses a descriptive and analytical research design to examine the influence of quick commerce platforms on consumer behaviour in urban India. The descriptive approach helps capture users' experiences, usage patterns, and perceptions, while the analytical approach evaluates the relationships between perceived benefits, emerging drawbacks, and behavioural outcomes to test the study hypotheses.

Primary data were collected from 400 urban consumers who regularly use quick commerce platforms. Convenience sampling was adopted, as usage is largely concentrated in metropolitan and Tier-1 cities characterised by high digital penetration and time-sensitive lifestyles. The sample included respondents from varied age groups, occupations, and income levels to reflect diverse urban consumption patterns.

Data were gathered through a structured questionnaire using five-point Likert-scale items. The instrument measured perceived merits such as convenience, time saving, accessibility, and product availability, along with demerits including impulse buying, dependency, higher prices, delivery errors, and product substitutions. Independent variables represented perceived merits, while behavioural outcomes served as dependent variables. Descriptive statistics, mean analysis, and correlation techniques were applied to identify patterns and behavioural trends, ensuring meaningful and objective interpretation of results.

Customer-Perceived Merits of Quick Commerce

The analysis of primary survey data collected from 400 urban quick commerce users indicates a strong and consistent perception of benefits associated with ultra-fast delivery services. Convenience and ease of ordering emerged as the most influential advantages. Nearly 86% of respondents agreed or strongly agreed that quick commerce applications are user-friendly, supported by intuitive interfaces, quick checkout processes, and seamless digital payment options. Many users highlighted that the ability to place orders within minutes, without advance planning or physical travel, has become an integral part of purchasing daily essentials in urban settings.

Time-saving benefits were identified as another major driver of platform usage. Around 82% of respondents reported that 10-minute delivery services help them manage busy urban routines, particularly during workdays, late evenings, or unexpected household requirements. For working professionals and dual-income households, quick commerce was perceived as an effective alternative to routine store visits, significantly reducing time spent on shopping-related activities.

With respect to accessibility and product availability, approximately 74% of respondents expressed satisfaction with the range of products offered on quick commerce platforms. Consumers particularly valued the availability of groceries, packaged food items, personal

care products, and emergency essentials at short notice. Continuous app accessibility and flexible service hours further enhanced reliability compared to physical retail stores with fixed operating schedules.

The study also found that quick commerce plays a supportive role in managing household needs. About 69% of users reported relying on these platforms for urgent or last-minute purchases, such as forgotten grocery items or household supplies. Overall, these advantages positively influence satisfaction and usage frequency. Nearly 71% of respondents used quick commerce platforms at least once a week, while 64% reported high overall satisfaction, reinforcing habitual usage patterns.

Emerging Demerits and Behavioural Concerns

While quick commerce delivers high levels of convenience, primary data from 400 urban consumers reveal several behavioural concerns linked to frequent use of ultra-fast delivery platforms. A key issue identified is impulse buying and over-consumption. The survey shows that 68% of respondents agreed or strongly agreed that they place orders without prior planning due to the speed and ease of delivery. Further, 61% admitted purchasing items they had not originally intended to buy, indicating that instant access and low effort weaken self-control and encourage unplanned consumption.

The findings also point to growing behavioural dependency and convenience-driven habits. About 57% of respondents acknowledged relying on quick commerce apps even for minor or non-urgent needs. Nearly 49% reported checking these apps multiple times a day, suggesting habitual engagement rather than need-based usage. This pattern reflects a shift from conscious shopping decisions to automatic reliance on instant delivery platforms.

Post-purchase regret and unnecessary spending emerged as additional concerns. Around 46% of respondents reported experiencing regret after placing quick commerce orders, mainly due to higher prices or redundant purchases. Among frequent users, regret levels rose to 54%, highlighting a clear link between repeated usage and negative post-purchase evaluations. Many consumers expressed dissatisfaction with paying premium prices for speed when purchases were made impulsively.

App fatigue was identified as a subtler behavioural issue. Nearly 42% of respondents stated that frequent notifications, repeated browsing, and multiple small orders caused mental

fatigue and reduced shopping enjoyment. Despite this, continued usage persisted due to habit and perceived convenience.

Finally, increased household expenditure was a notable outcome. About 63% of respondents observed a rise in monthly grocery and household spending after adopting quick commerce, with 38% estimating a 10–20% increase. Overall, the findings suggest that alongside convenience, quick commerce introduces behavioural risks related to impulse buying, dependency, regret, and higher spending, emphasizing the need for balanced and mindful consumption.

Service Experience and Expectation–Performance Gaps

While quick commerce platforms are celebrated for their speed and convenience, survey data from 400 urban consumers reveal notable service experience issues that create expectation–performance gaps. Delivery errors and delayed fulfilment emerged as a significant concern: 37% of respondents reported receiving orders later than promised, and 22% experienced missing items or incomplete deliveries at least once in the last three months. These delays, though often short, erode the perception of reliability, particularly among users who depend on ultra-fast delivery for time-sensitive needs.

Product substitutions and quality inconsistencies also contribute to customer dissatisfaction. About 41% of respondents indicated that their orders occasionally contained substituted items, often with lower quality or different brands than expected. Among these users, 48% reported dissatisfaction with substitutions, citing concerns about value for money and diminished trust in the platform's curation.

The mismatch between promised speed and actual experience was highlighted by 34% of respondents, who felt that delivery promises (10–20 minutes) were not consistently met, especially during peak hours or high-demand periods. These gaps amplify perceived service unreliability, even when deliveries eventually arrive.

Service failures directly impacted trust and overall satisfaction. Nearly 39% of users expressed reduced confidence in platform reliability after repeated delivery issues or substitutions, and 28% considered switching to alternative providers. Interestingly, even satisfied customers acknowledged that minor errors decreased their overall perceived value, indicating that expectation–performance gaps influence loyalty as much as actual delays or errors.

Overall, the findings suggest that while quick commerce delivers remarkable convenience, service inconsistencies—such as delayed fulfilment, substitutions, and quality lapses—create significant behavioural and perceptual challenges. Platforms must address these gaps to maintain trust, satisfaction, and long-term consumer engagement, balancing speed with accuracy and quality.

Price Trade-Offs and Changing Value Perceptions

Quick commerce platforms offer unmatched speed, but this convenience comes at a cost. Survey data from 400 urban consumers indicate that users are willing to pay a premium for faster delivery. Around 62% of respondents reported paying 5–15% extra on products or delivery charges to secure 10-minute fulfilment. Among frequent users, this willingness increased to 71%, highlighting how habitual reliance reinforces acceptance of higher prices.

Respondents also showed a conscious acceptance of elevated delivery and product costs, with 58% agreeing that the convenience of instant access outweighs monetary considerations. This reflects a significant shift in consumer priorities, where time savings and immediate fulfilment are valued more than price.

However, this speed-focused behaviour has consequences. 44% of users reported occasional post-purchase regret, often after impulse orders, indicating that instant gratification sometimes leads to emotional decision-making. Over time, repeated premium payments may normalize higher spending and reduce sensitivity to price differences. 39% of respondents noted an increase in monthly household expenditure after using quick commerce, demonstrating its economic impact.

Overall, while consumers clearly value speed, the data suggest that platforms must balance premium pricing with perceived fairness, ensuring that convenience does not unintentionally lead to dissatisfaction or financial strain, even as immediate fulfilment becomes a core expectation in urban lifestyles.

Lifestyle Changes and Broader Consumption Shifts

Quick commerce has significantly reshaped urban lifestyles and consumption patterns. Survey data from 400 urban consumers reveal that 61% of respondents now visit local retail stores less frequently, preferring instant delivery for groceries, household essentials,

and personal care items. This shift highlights a structural change in shopping behaviour, with convenience taking precedence over traditional in-person purchases.

The study also shows increased dependence on digital platforms. About 68% of respondents rely on quick commerce apps for most routine household needs, citing accessibility, real-time availability, and seamless payment options. The trend is especially strong among working professionals and dual-income households, reflecting the role of time pressure in decision-making. Around 72% of respondents acknowledged that they often make purchase choices under urgency, prioritizing speed over careful planning or price comparison, which also contributes to impulse buying.

These shifts have broader social and behavioural implications. Nearly 45% of respondents expressed concern that frequent use of quick commerce has made their consumption more impulsive and habitual. Increased reliance on instant delivery reduces engagement with local retailers and can foster convenience addiction, higher household spending, and altered budgeting practices. Overall, while quick commerce enhances efficiency and accessibility, it also reshapes urban consumption, lifestyles, and decision-making, reinforcing speed and instant gratification as dominant drivers of modern consumer behaviour.

Key Findings and Discussion

Table 1 : Hypothesis Testing Results

Hypothesis	Variables Tested	Statistical Test Applied	Key Result	p-value	Decision
H1	Convenience & Time Saving Usage Frequency	Pearson Correlation	Strong positive correlation (r= 0.68)	<0.001	Accepted
H2	Usage Frequency Impulse Buying	Pearson Correlation	Moderate positive correlation (r= 0.59)	<0.001	Accepted
H3	Usage Frequency Household Spending	Linear Regression	Significant positive impact (β = 0.52)	<0.001	Accepted
H4	Behavioural Dependency Post-Purchase Regret	Pearson Correlation	Positive relationship (r= 0.47)	<0.001	Accepted
H5	Delivery Speed Willingness to Pay Higher Price	Mean Comparison & Regression	Significant positive influence (β = 0.61)	<0.001	Accepted
H6	Service Inconsistency Expectation–Performance Gap	Pearson Correlation	Strong positive correlation (r= 0.65)	<0.001	Accepted

Table 2: Summary of Findings and Conclusions

Hypothesis	Conclusion
H1	Convenience and time-saving benefits significantly increase the frequency of quick commerce usage among urban consumers.
H2	Higher usage frequency leads to increased impulse buying and unplanned purchases.
H3	Frequent reliance on quick commerce contributes to higher household spending levels.
H4	Behavioral dependency on quick commerce platforms results in greater post purchase regret.
H5	Consumers consciously accept higher prices in exchange for faster delivery speed.
H6	Service inconsistencies significantly widen the gap between customer expectations and actual service performance.

Overall Interpretation

The hypothesis testing results strongly support the study's central argument that quick commerce delivers high convenience and satisfaction but also introduces notable behavioural and financial trade-offs. While speed and accessibility drive frequent usage, they simultaneously encourage impulse consumption, dependency, and increased spending, confirming the need for a balanced evaluation of ultra-fast delivery models.

The study of 400 urban quick commerce users reveals a nuanced picture of modern consumption. Primary data show that convenience, time saving, accessibility, and product availability are the strongest drivers of usage, with over 80% of respondents highlighting these merits. Simultaneously, behavioural costs—impulse buying (68%), over-dependence (57%), post-purchase regret (46%), app fatigue (42%), and increased household spending (63%)—are significant, indicating that ultra-fast delivery fosters both convenience and consumption-related risks.

The data also highlight expectation–performance gaps, as 37% reported delayed deliveries, 41% faced product substitutions, and 39% expressed reduced trust due to service inconsistencies. Additionally, speed and convenience have reshaped lifestyle patterns, reducing visits to local stores (61%) and increasing reliance on digital platforms (68%), reflecting broader urban behavioural shifts.

When compared with existing literature, these findings extend beyond traditional satisfaction-focused studies by emphasizing behavioural dependency, trade-offs, and lifestyle implications, areas rarely explored in the Indian quick commerce context. The study contributes to consumer behaviour research by linking instant gratification, impulsive consumption, and spending patterns to platform adoption and usage frequency, providing evidence that speed and convenience, while highly valued, are not cost-free.

Overall, the findings underscore the importance of balancing merits and behavioural costs, offering insights for businesses and policymakers to design platforms that maximize convenience while mitigating negative behavioural outcomes.

Implications for Platforms, Consumers, and Policymakers

The study highlights actionable implications for platforms, consumers, and policymakers. For quick commerce platforms, maintaining service reliability, accurate delivery, and product quality is essential to build trust and reduce expectation–performance gaps. Platforms can also use features like spending summaries, curated suggestions, and reminders to encourage responsible consumption without compromising engagement.

For consumers, awareness of behavioural risks—impulse buying, dependency, and rising household spending—is crucial. Promoting planned purchasing, budgeting, and mindful usage can help users balance convenience with financial control and reduce post-purchase regret.

At the policy level, sustainable consumption should be encouraged through guidelines on eco-friendly delivery, transparent pricing, and behavioural nudges that discourage over-consumption. Initiatives such as suggested delivery schedules or incentives for bulk orders can reduce impulsive small orders and environmental impact.

Collectively, these measures ensure that quick commerce delivers convenience and efficiency while minimizing behavioural, financial, and social costs, supporting a more responsible and sustainable urban consumption ecosystem.

Conclusion and Directions for Future Research

This study concludes that quick commerce is reshaping urban consumer behaviour by offering unparalleled convenience, speed, and accessibility, while simultaneously introducing behavioural risks such as impulse buying, over-dependence, post-purchase regret, and rising

household expenditures. The chapter contributes to consumer behaviour literature by moving beyond satisfaction metrics to explore dependency, trade-offs, and lifestyle impacts, areas largely under-researched in the Indian context.

However, the study has limitations. Data were collected only from urban consumers in select metropolitan areas, using self-reported measures, which may limit generalizability. The cross-sectional design also restricts the ability to assess long-term behavioural changes.

Future research can expand the scope by including diverse geographic regions, longitudinal studies, and qualitative insights to capture evolving patterns of consumption. Studies could also examine psychological triggers, platform features, and socio-economic factors influencing dependency, impulse spending, and sustainable consumption, thereby providing deeper insights for platforms, consumers, and policymakers.

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AI in Accounting: A Comprehensive Swot Analysis

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Abstract

Artificial Intelligence (AI) is reshaping the accounting field by enabling automation, advanced data analysis, machine learning applications, and more efficient information processing. This paper examines the integration of AI in accounting using a SWOT (Strengths, Weaknesses, Opportunities, Threats) approach. The analysis is based solely on secondary sources, including scholarly research, professional publications, and industry reports. The results indicate that AI improves precision, productivity, and strategic insight within accounting practices. However, several challenges remain, such as substantial implementation expenses, data security risks, potential workforce displacement, and the absence of unified global regulations. The study concludes by offering actionable recommendations, practical insights, and a detailed outlook for future research in this area.

Keywords: **Artificial Intelligence (AI), Machine Learning (ML), Accounting, SWOT Analysis.**

Introduction

Technological progress has increasingly become a major force behind global economic shifts, and the accounting profession has been significantly reshaped by this wave of digital transformation. Among the most influential developments is Artificial Intelligence (AI), a branch of technology that equips machines and software with the capacity to perform tasks that once required human cognitive abilities—such as analysing information, recognizing patterns, making decisions, and solving complex problems. What once existed mainly as a theoretical concept has now evolved into a practical and powerful tool deeply embedded in modern accounting environments. AI-driven systems support a wide range of accounting functions, including routine task automation, fraud identification, tax computation, financial forecasting, and advanced audit analyses.

Traditional accounting relied heavily on manual input, document handling, and human calculations—methods that, while effective in the past, are inherently slow, vulnerable to mistakes, and costly for organizations to sustain. AI has disrupted this long-standing model by offering superior precision, speed, and cost-efficiency. The use of intelligent technologies

reduces time spent on monotonous activities, allowing accountants to redirect their expertise toward more strategic areas such as financial interpretation, risk evaluation, and organizational advisory roles. This shift marks a transformative change in the profession, repositioning accountants from clerical workers to analytical leaders and strategic contributors within their organizations.

Several core AI technologies are responsible for revolutionizing the accounting landscape. Machine learning (ML) enables systems to recognize trends in historical financial data, improving the accuracy of predictions and analytical insights. Robotic Process Automation (RPA) handles repetitive administrative tasks—such as reconciling accounts, processing invoices, and managing payroll—thereby increasing productivity and reducing human workload. Natural Language Processing (NLP) enhances the ability of accounting software to interpret unstructured data contained in reports, emails, contracts, and other documents. Predictive analytics leverages AI and statistical models to anticipate potential errors, detect irregularities, forecast economic conditions, and identify emerging business risks. Deep learning algorithms, inspired by biological neural networks, uncover hidden patterns linked to fraudulent activities or internal control weaknesses with an accuracy level that surpasses traditional audit tools.

Despite these substantial advantages, implementing AI in accounting introduces a range of challenges that organizations must approach thoughtfully. A major barrier is the considerable financial investment required for advanced AI technologies. Smaller organizations often find it difficult to budget for software acquisition, customization, training programs, and ongoing system maintenance. Since AI depends heavily on large volumes of sensitive data, concerns related to data protection, confidentiality, and cybercrime become increasingly prominent. Security breaches, unauthorized data manipulation, and hacking attempts pose serious ethical, legal, and operational risks.

Resistance from employees is another challenge commonly observed during AI adoption. Many accountants worry that automation may threaten job stability or require them to adapt to unfamiliar tools and workflows. This makes professional development, digital literacy training, and organizational support essential for ensuring a smooth transition. Ethical considerations also come to the forefront, particularly regarding the fairness and transparency of algorithmic decision-making. Maintaining objectivity, avoiding biased outcomes, and complying with evolving regulatory requirements are critical for sustaining public trust in AI-enhanced accounting practices.

Ultimately, this research aims to contribute valuable insights to the ongoing discourse on digital change within the accounting sector. It underscores that AI should not be viewed merely as a technological convenience but as a strategic asset capable of enhancing decision-making, improving financial oversight, and elevating the professional role of accountants. At the same time, it highlights the importance of responsible AI adoption, robust cybersecurity measures, ethical safeguards, and continuous skill development to ensure that organizations maximize AI's potential while minimizing its risks.

Literature Review

Kumar and Rani (2021) highlight that AI significantly improves accuracy by reducing human involvement in repetitive tasks such as reconciliation and invoice processing. Their research emphasizes that automation minimizes errors, enhances speed, and lowers operational costs.

Smith (2020) argues that machine learning algorithms provide superior fraud detection capabilities compared to conventional auditing tools. AI systems can analyze vast datasets, identify anomalies, and flag suspicious activities in real time.

Kaur and Singh (2022) discuss how accounting software integrated with AI—such as Zoho Books AI, QuickBooks AI, and Sage Intacct—has transformed data analysis and financial reporting. However, their study recognizes that technical upskilling is essential.

Deloitte (2023) reports that over 63% of global accounting firms have implemented AI tools in some capacity. However, firms express concerns regarding cybersecurity, data integrity, and algorithmic transparency. Deloitte predicts significant growth in AI-driven audit analytics in the next decade.

Brown and Wilson (2021) highlight ethical concerns involving data privacy, algorithmic bias, and lack of transparency. Their work calls for strict ethical guidelines and regulatory oversight to address risks.

The ICAI Knowledge Report (2024) emphasizes AI's role in taxation, financial forecasting, and risk management. The report recognizes emerging job roles such as "AI Auditor" and warns of potential job displacement.

Research Methodology

Research Design

This research employs a qualitative methodology based on the analysis of secondary data. The sources of secondary data include scholarly articles from peer-reviewed academic journals, which provide valuable theoretical and empirical insights into the subject. Industry reports from prominent firms such as Deloitte, KPMG, and PwC also serve as key resources, offering up-to-date information on current trends and practices. In addition, publications from professional organizations like the Institute of Chartered Accountants of India (ICAI), the American Institute of Certified Public Accountants (AICPA), and the Association of Chartered Certified Accountants (ACCA) help inform the study with guidance on regulations and professional standards. Furthermore, the research draws upon relevant books and digital repositories, which provide comprehensive information on the technical and theoretical aspects of artificial intelligence in accounting. Lastly, credible online articles and research papers offer supplementary perspectives, enriching the study with contemporary developments in the field. Together, these varied secondary sources form the basis for the study's analysis and findings.

Limitations

This research is exclusively based on secondary data, utilizing existing materials such as academic studies, industry reports, and professional publications. However, due to the fast-paced nature of technological progress, there is a possibility that some of the findings may become outdated in the future. As AI and accounting technologies continue to evolve, new insights and developments may emerge, necessitating ongoing research to stay aligned with these advancements in the field.

Analysis: SWOT Analysis of AI in Accounting

Strengths

Improved Accuracy through Intelligent Automation. Today's AI technologies do far more than correct basic mistakes; they use contextual analysis to evaluate transactions against organizational rules, past patterns, and expected market behaviour. This advanced automation not only identifies errors but can also anticipate potential inaccuracies and notify

accountants in advance. With machine-learning-based anomaly detection, financial information is constantly updated and corrected, producing almost real time precision that exceeds what traditional or partially automated methods can achieve. This heightened accuracy leads to more trustworthy financial reports and reinforces compliance across the organization.

Time and Cost Savings through Autonomous Processes. AI has introduced self-running accounting processes, allowing complex workflows—like invoice handling, expense verification, and closing procedures—to operate with little to no manual involvement. Instead of merely accelerating tasks, AI streamlines the entire workflow by removing redundant steps and improving efficiency within the process. As a result, organizations can shorten reporting cycles, lower costs associated with manual oversight, and allocate staff to higher-value roles such as analysis and advisory services. The time saved also enhances decision-making speed and strengthens the agility of financial operations.

Ongoing and Automated Auditing. The auditing landscape has transformed with AI's ability to conduct continuous risk evaluations, monitoring financial activity around the clock instead of relying solely on periodic reviews. These systems constantly examine transaction records, supplier interactions, and compliance behaviours to detect irregularities that could signal fraud, breaches, or control issues. Unlike traditional sampling methods, AI evaluates entire datasets and provides auditors with real time insights into risk levels. This greatly reduces the chance of overlooked problems and improves the transparency and reliability of financial reporting.

Advanced Analytics and Predictive Capabilities. Modern AI solutions deliver more sophisticated insights through predictive data analytics, merging financial information with external variables such as industry changes, customer trends, and market conditions. This shift turns accounting into a forward-looking function capable of spotting potential cash flow concerns, identifying growth opportunities, and recognizing areas where performance can be improved. AI can also run multiple what-if simulations, giving decision-makers a clear view of the financial outcomes of different strategies. This proactive approach helps businesses plan more effectively and maintain long-term competitiveness.

Enhanced Client Service Through Personalized AI Support. AI allows accounting firms to deliver highly personalized client experiences. Instead of basic automated responses, businesses now use sophisticated conversational AI that learns from client preferences, analyses

financial histories, and offers tailored recommendations. These tools can instantly generate reports, assist clients with routine financial questions, and provide continuous support at any time of day. By automating standard communication and information retrieval, accountants can devote more attention to strategic guidance and relationship-building. This enhances client satisfaction, builds trust, and strengthens the company's competitive edge.

Weaknesses

Significant Financial Burden of AI Adoption. The introduction of artificial intelligence into accounting systems involves substantial financial demands that can discourage widespread adoption. Beyond the cost of purchasing AI software, firms often need to modernize existing IT infrastructure, transition from legacy platforms, and ensure secure data environments. For smaller organizations, these financial requirements can outweigh short-term benefits. In addition, recurring expenses such as system upgrades, technical support, cybersecurity management, and model recalibration create ongoing cost pressures, making long-term affordability a major concern.

Insufficient Technological Expertise Among Accounting Professionals. The accelerated use of AI has highlighted a lack of technological readiness within the accounting workforce. While professionals are well-versed in financial standards and reporting frameworks, many have limited exposure to data analytics, algorithm-based systems, and AI-driven decision tools. This skills mismatch can reduce confidence in AI outputs and hinder effective implementation. Addressing this challenge requires continuous professional development, yet limited training opportunities and resistance to digital transformation often slow the learning process.

Increased Vulnerability Due to Automation Dependence. Heavy reliance on AI-powered accounting systems introduces new operational vulnerabilities. Technical malfunctions, system outages, or third-party service disruptions can interrupt essential financial functions and delay reporting timelines. Furthermore, automated platforms face heightened exposure to cyber threats, including data breaches and system manipulation. Without appropriate safeguards, manual override options, and disaster recovery strategies, excessive automation may weaken organizational resilience rather than strengthen it.

Inability to Replicate Human Judgment and Ethical Reasoning. Despite technological progress, AI remains limited in its capacity to exercise professional judgment

or ethical awareness. Accounting decisions frequently involve ambiguity, regulatory interpretation, and ethical evaluation—areas that require human reasoning and experience. AI systems function based on learned patterns and predefined logic, which restricts their ability to respond appropriately to novel or morally complex situations. Consequently, human oversight is essential to ensure responsible decision-making and ethical compliance.

Dependence on Data Integrity and Risk of Algorithmic Bias. The effectiveness of AI in accounting is directly linked to the accuracy and balance of the data it processes. Poor-quality, outdated, or biased datasets can distort outcomes and lead to unreliable financial insights. If training data reflects historical inconsistencies or systemic bias, AI systems may perpetuate these issues instead of correcting them. Maintaining clean, unbiased data and monitoring algorithmic behaviour requires constant attention, adding to the managerial and ethical responsibilities of accounting professionals.

Opportunities

Growth of Cross-Disciplinary Accounting Careers. The increasing use of artificial intelligence in accounting is opening pathways to cross-disciplinary career roles that merge financial expertise with digital intelligence. Accountants are now positioned to work as AI oversight professionals, financial systems analysts, and technology-focused compliance advisors. These roles emphasize supervising automated decision processes, interpreting complex data outputs, and aligning AI applications with regulatory and ethical standards. This shift expands the professional scope of accountants, enabling them to contribute strategically rather than focusing solely on traditional financial tasks.

Expansion of Borderless Accounting Services. Advancements in AI-enabled digital platforms have made it possible for accounting services to operate without geographical limitations. Firms can now deliver real time financial support, manage client records, and collaborate across different regions through intelligent cloud-based systems. Automated regulatory checks and data synchronization further support international operations. This evolution creates opportunities for firms to reach new markets, improve service flexibility, and efficiently support clients across multiple jurisdictions.

Advancement of Audit Accuracy and Assurance Models. Artificial intelligence offers the opportunity to significantly enhance audit reliability and effectiveness. By examining entire

financial datasets rather than limited samples, AI improves risk identification and anomaly detection. Continuous analysis enables earlier recognition of control weaknesses and financial irregularities. This approach strengthens assurance quality and shifts auditing toward a more preventive and insight-driven model, increasing stakeholder confidence in financial disclosures.

Synergy Between AI and Emerging Digital Technologies. The integration of AI with technologies such as decentralized ledgers, automated contracts, and connected digital systems presents new opportunities for secure and transparent financial operations. AI can interpret large volumes of real time transactional data, verify compliance automatically, and highlight suspicious activities with greater accuracy. This technological combination enhances trust, reduces manual verification efforts, and supports more resilient financial infrastructures.

Advancement of Intelligent Financial Guidance. AI is redefining financial advisory services by enabling continuous, customized, and data-driven recommendations. Intelligent systems can assess financial performance in real time, evaluate multiple strategic options, and adjust advice as conditions change. This allows advisors to move beyond periodic consultations and engage in ongoing strategic collaboration with clients. By automating analytical tasks, AI empowers professionals to focus on long-term planning, value creation, and personalized client engagement.

Threats

Escalating Digital Security and Data Integrity Risks. AI-based accounting systems operate within highly connected digital environments, making them attractive targets for advanced cyber threats. In addition to conventional breaches, organizations now face risks such as manipulated training data and unauthorized interference with automated decision models. These attacks can silently distort financial outputs, compromise reporting accuracy, and erode confidence in automated systems. Without specialized AI-security controls, continuous monitoring, and strong governance policies, protecting sensitive financial information becomes increasingly difficult.

Employment Instability and Organizational Resistance. The growing automation of accounting functions presents a threat to workforce stability, particularly for roles focused on repetitive processing tasks. As AI adoption accelerates, some professionals may face reduced job opportunities, leading to anxiety, resistance to change, and declining engagement.

If organizations fail to manage this transition through reskilling initiatives and clear career pathways, they risk losing experienced staff and slowing digital transformation efforts due to internal pushback.

Ethical Ambiguity and Responsibility Gaps. AI-driven accounting systems raise significant concerns regarding ethical accountability. When automated tools influence financial decisions, determining responsibility for errors or biased outcomes becomes challenging. The lack of transparency in complex algorithms further complicates oversight, making it difficult to explain AI-generated results to regulators or stakeholders. These issues increase the risk of ethical lapses and weaken trust in AI-supported accounting processes.

Fragmented Regulatory Landscape and Compliance Risks. The rapid expansion of AI in accounting has created a mismatch between technological innovation and regulatory readiness. Laws governing AI usage, data protection, and automated decision-making differ widely across regions and continue to evolve. For organizations operating across borders, this regulatory fragmentation increases compliance complexity and legal exposure. Failure to adapt to changing regulatory expectations can result in penalties, operational disruptions, and reputational harm.

Dependence on External Technology Providers. Many organizations rely heavily on third-party vendors for AI-enabled accounting platforms and cloud services. This dependence introduces risks related to service availability, system updates, data control, and vendor compliance standards. Any disruption, pricing change, or regulatory failure on the vendor's side can directly impact an organization's financial operations. Effective risk management therefore requires careful vendor selection, contractual safeguards, and contingency planning.

Conclusion, Suggestions & Recommendations

Conclusion

AI is revolutionizing the accounting industry by automating routine tasks, enhancing accuracy, facilitating advanced predictive analytics, and improving audit quality. However, successfully integrating AI comes with challenges, including high implementation costs, cybersecurity risks, ethical concerns, and a shortage of required expertise. To address these issues, the accounting field must adapt by embracing digital competencies and establishing

robust governance frameworks. Instead of replacing accountants, AI will transform their roles, redirecting them toward more analytical and advisory responsibilities, thereby strengthening their ability to provide strategic insights and support decision-making.

Suggestions

To successfully incorporate AI into accounting, it is vital to support ongoing education programs that help accountants build expertise in AI and data analytics. Conducting frequent IT audits and enhancing cybersecurity protocols will safeguard against risks, while promoting collaboration between accounting associations and tech developers can facilitate smoother integration of new technologies. Raising awareness about ethical AI use is important for ensuring responsible implementation, and testing AI through pilot projects prior to full adoption will allow for the identification and resolution of any challenges, ensuring a more effective transition.

Recommendations

Accounting firms should adopt a hybrid approach that blends AI technology with human oversight to maintain accuracy and accountability. Regulators must create universal AI auditing standards and ethical principles to guide responsible AI implementation. Educational institutions should revise their accounting programs to incorporate machine learning, Python, data visualization, and AI ethics, equipping students with the skills needed for the future. Technology providers, on the other hand, should focus on ensuring transparency in algorithms, safeguarding data privacy, and developing unbiased systems to foster trust and fairness in AI-driven solutions.

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AN ANALYTICAL STUDY OF UPI FRAUD PATTERNS AND THEIR IMPACT ON TRUST AND USAGE BEHAVIOUR AMONG GENERATION X USERS IN MUMBAI

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Abstract

This study examines UPI fraud patterns and their impact on trust and usage behaviour among Generation X users in Mumbai. The study uses primary data from 82 respondents. It analyses UPI usage patterns, safety awareness and fraud experiences. The findings reveal a high level of daily UPI usage but moderate awareness of safety practices. There is limited exposure to formal awareness programs related to UPI fraud. Phishing and fake QR code scams are the most common frauds faced by the respondents. Due to fraud incidents, there is reduced trust in UPI which leads to cautious or reduced UPI usage. The study reveals that UPI fraud is associated with the frequency of UPI usage. Frequent users face a higher risk of fraud due to greater exposure. However, educational qualification doesn't have a significant effect, as users across all educational levels are equally vulnerable to UPI fraud.

Key Words: **UPI fraud, Generation X, Digital Payments, Usage Behaviour**

Introduction

India's Unified Payments Interface (UPI) stands out as a game-changing advancement in the nation's payment infrastructure. Launched in April 2016 by the National Payment Corporation of India (NPCI) with oversight from the Reserve Bank of India (RBI), it enables instant payment transfers between bank accounts via mobile apps.

UPI offers real-time, 24/7 transactional systems like NEFT, which processes in batches and RTGS, limited to business hours and high-value transfers. It unifies various banks into one app for seamless fund routing, peer-to-peer requests and merchant payments.

Users generate a Virtual Payment Address (VPA) as a unique ID, avoiding the sharing of account numbers or IFSC codes for added privacy and ease. This approach bolsters security over methods like NEFT or RTGS through two-factor authentication.

The remarkable rise of digital financial services in India has transformed the way individuals and business organizations transact. At the same time, it has also given birth to an unprecedented increase in digital fraud. With the government's strong push towards a cashless economy after the 2016 demonetization and the successive rise of UPI, there has been exponential growth in electronic payments in India.

Frauds in digital payment do not happen in a uniform way. They have become more cutting-edge using technology. As stated by the National Crime Records Bureau (NCRB), cases of online financial fraud are increasing rapidly in India. The Reserve Bank of India (RBI) has also emphasized these matters in its reports and circulars. Therefore, there is a requirement for users to stay alert and for the banks and fintech companies to strengthen their security measures.

Review of Literature

Wadkar and Munde (2025), in their research paper titled "Cyber security challenges in UPI payment frauds in India" investigate the vulnerabilities in India's UPI ecosystem and examine various cybersecurity threats impacting digital transactions. This research relies on data sourced from secondary materials. The study highlights that while UPI has revolutionised mobile banking and digital payments, it has also exposed users to significant risks like phishing, malware attacks and data breaches. Research outcomes indicate that insufficient user education, fragile security verification and accelerated digital integration minus proper protections drive the surge in fraudulent activities.

Pathak and Joshi (2023), in their study titled "Navigating the Digital Payment Landscape: An analysis of UPI app usage and security perceptions" explore adoption trends, user behaviours and fraud experiences associated with UPI apps. This investigation involved 513 participants from Ahmedabad and Gandhinagar. Findings show that younger users, especially students, are the largest users of UPI apps. Google Pay is the most widely preferred platform. Further, the study shows that the users express overall trust in digital transactions. At the same time significant number of users have encountered fraudulent incidents, raising concerns about security lapses.

Hirapara et al. (2024), through their research "A study on the awareness of various digital payment frauds among Gen-Z in Ahmedabad city" examine Gen-Z's knowledge and

behavioural reactions to digital scams. investigate the level of awareness and behavioural responses of Gen-Z individuals towards digital payment frauds. Their findings indicate that while older Gen-Z members show slightly higher awareness of fraud types like phishing and identity theft. However, age plays a minimal role in shaping how often they use digital payments or their degree of worry about scams. Personal experience with fraud strongly correlates with awareness levels.

Ruangmei and Gethe (2023), in their study titled "A study on modes of digital payment systems, analysis of frauds occurring through digital payment systems" investigate user behaviour, awarenss and experiences with digital payments and frauds. Drawing from a survey of 60 participants, their work highlights that 93% use digital payments. UPI is the dominant mode of digital payment. Convenience and simplicity fuel adoption, though technical issues and a lack of acceptance remain major hurdles in the usage of digital payment. Despite high usage, 45% of users reported increased digital payment activity post COVID and 83% claimed benefits. However, 28% had reduced usage due to fraud experiences and only 28% reported incidents.

Sharma et al. (2025), in their study titled "AI-Powered Digital Payments: Evolution, Securing Transactions and Preventing Frauds" delve into how artificial intelligence enhances digital payment systems by improving security, fraud detection and user experience. It highlights AO's role in real-time anomaly detection, biometric authentication and predictive analytics for financial forecasting. Despite the benefits, the study notes concerns around data privacy, AI bias and regulatory compliance. The findings suggest that AI-driven tools like chatbots and voice recognition are reshaping customer engagement, while machine learning models are crucial for fraud prevention. The study concludes that AI is central to the future of secure, efficient and inclusive digital payment ecosystems.

Research Gap

Existing research on UPI fraud largely focuses on younger users and selected regions, with very limited attention on Generation X users in Mumbai. There is insufficient understanding of how UPI frauds affect Gen X users' trust, usage behaviour and psychological and financial confidence. Therefore, the present research is an attempt to fill this research gap.

Objectives of the Study

The following are the objectives of the study:

1. To explore usage patterns and spending behaviour of users in UPI transactions.
2. To analyse user awareness, safety practices and exposure to UPI fraud prevention measures.
3. To assess the prevalence, nature and financial effect of UPI fraud among users.
4. To evaluate user confidence in UPI apps for handling fraud reports and the resolution process.

Hypothesis Statements

$\mathbf{H_0}$ = There is no significant relationship exist between educational qualification and incidence of UPI fraud.

$\mathbf{H_0}$ = There is no significant relationship exist between the frequency of using UPI for payments and the incidence of UPI fraud.

Research Methodology

6.1 Research Approach:

This study employs a descriptive research design which is appropriate as it aims to describe and analyse UPI fraud trends and their impact on users based on observed data.

6.2 Research Area:

The research takes place in the suburban areas of Mumbai, specifically covering the region from Borivali to Bandra.

6.3 Sampling Technique

A convenience sampling method is utilized for selecting participants in the study. This method is chosen due to its practicality and efficiency in accessing respondents within the target population.

6.4 Target Group and Sample Size:

The focus population comprises Generation X individuals (born 1965-1980) residing in Mumbai who are users of UPI payment platforms.

6.5 Data Type and Source:

This research mainly draws from primary data collected through a Google Form survey, supported by secondary data obtained from research papers and the internet.

6.6 Data Analysis Methods:

For effective analysis and interpretation, the collected data is organized using tables and graphical representations. Hypothesis testing employs the chi-square method.

Data Analysis Overview and Findings of the Study

7.1 Descriptive Analysis Of Demographic Factors.

Table 7.1.1 Demographic Section

Demographics		Count
Gender	Female	40
	Male	42
Age	44–48	60
	49–53	9
	54–57	5
	58–60	8
Educational Qualification	SSC/HSC	7
	Graduate	28
	Postgraduate or higher	31
	Professional	16
Occupation	Government Employee	15
	Homemaker	7
	Private Sector Employee	39
	Self-employed	18
	Others	3

7.2 Objectivewise Analysis

Objective 1: To explore usage patterns and spending behaviour of users in UPI transactions.

Table 5. Frequency of UPI for payments

PARTICULARS	COUNT
Daily	49
Few times a week	15
Occasionally	11
Rarely	7
TOTAL	**82**

The table shows that a majority of respondents use UPI daily. It indicates high dependence on digital payments for routine transactions. Only a small proportion use it rarely.

Table 6. Which UPI apps do you primarily use

PARTICULARS	COUNT
Google Pay	72
BHIM	11
PhonePe	23
Paytm	16
Other	2

Google Pay emerges as the most preferred UPI app, followed by PhonePe and Paytm. It suggests that users rely mainly on a few dominant platforms.

Table 7. Common types of UPI transactions you perform

PARTICULARS	COUNT
Bill payments	55
Grocery/retail shopping	56
Mobile recharge	59
Money transfers	54
Online shopping	48

UPI sees the highest usage for mobile recharges, grocery shopping, money transfers and bill payments.

Table 8. Monthly Expenditure via UPI

PARTICULARS	COUNT
Less than ₹15,000	46
₹15,001 – ₹30,000	16
₹30,001 – ₹50,000	20
TOTAL	**82**

The majority of participants spend under Rs.15,000/- per month through UPI. It indicates that it is primarily used for low-value transactions.

Objective 2: To analyse user awareness, safety practices and exposure to UPI fraud prevention measures.

Table 18. Rate your knowledge of safe digital transaction practices

PARTICULARS (RATING)	COUNT
1 (Low)	2
2	7
3	26
4	26
5 (High)	21
TOTAL	**82**

Most respondents rate their knowledge at a moderate to high level. It indicates reasonable awareness of digital safety practices.

Table 19. Which of these safety habits do you follow regularly

PARTICULARS	COUNT
Avoid unknown links	63
Do not share OTP or UPI PIN	70
Check transaction messages	47
Download apps only from reliable sources	40

A large number of users follow basic safety habits such as avoiding unknown links and not sharing OTPs or UPI or UPI PINs. It reflects good security awareness.

Table 20. How did you first learn about using UPI and staying secure with it?

PARTICULARS	COUNT
Bank or customer care	28
Family/friends	49
Internet/YouTube	29
No formal learning	19

Family and friends are the primary source of learning, followed by online platforms and banks. It shows the importance of informal and digital channels.

Table 21. Have you ever attended or seen awareness material related to UPI fraud

PARTICULARS	COUNT
Yes	36
No	46
TOTAL	**82**

Over 50% of the respondents have not encountered formal fraud awareness material. It indicates a gap in outreach efforts.

Table 25. What type of RBI Guidelines are you aware of

PARTICULARS	COUNT
Complaint Redressal Mechanism	30
Digital Literacy Campaigns	19
RBI's DigiSaathi Helpline	26
RBI's Zero Liability Policy (2017)	23
Two-Factor Authentication (2FA)	48

Awareness is higher for Two-Factor Authentication, while knowledge of other RBI initiatives such as digital literacy campaigns, remains limited.

Objective 3: To assess the prevalence, nature and financial effect of UPI fraud among users.

Table 10. Have you ever faced a UPI fraud incident

PARTICULARS	COUNT
No	67
Yes	15
TOTAL	**82**

Source: Primary Data

Most participants reported no encounters with UPI fraud. It suggests overall perceived safety. Some have experienced fraud incidents.

Respondents who have faced fraud

Table 11. How often have you faced UPI fraud incidents

PARTICULARS	COUNT
Once	8
2–3 times	6
More than 3	1
TOTAL	**15**

Most affected users faced fraud only once, while a smaller group experienced repeated incidents. It indicates varying levels of vulnerability.

Table 12. What type of fraud did you experience

PARTICULARS	COUNT
App clone/download trap	2
Fake QR code	6
Impersonation (caller as bank rep)	2
Remote access scam (Anydesk, Ultraviewer, etc)	1
Unknown Phishing (Links, SMS, Email, etc)	6

Source: Primary Data

Phishing and fake QR code scams are the most commonly reported fraud types. It shows the dominance of social engineering techniques.

Objective 4: To evaluate user confidence in UPI apps for handling fraud reports and the resolution process.

Table 14. Did you report the fraud

PARTICULARS	COUNT
Yes	10
No	5
TOTAL	**15**

A majority of fraud victims reported the incident, while a significant minority did not. It indicates mixed reporting behaviour.

Table 15. To whom did you report it

PARTICULARS	COUNT
Bank	2
Police or Cyber Cell	2
UPI App (e.g., Paytm, GPay)	3
Helpline/Customer Care	4
Did not report	4
TOTAL	**15**

UPI apps and customer services are the most common reporting channels, though certain users chose not to notify authorities about the events.

Table 16. Was the issue resolved

PARTICULARS	COUNT
Partially resolved	2
Fully resolved	3
Not resolved	4
No action taken	6
TOTAL	**15**

Most cases were either unresolved or received no action. It suggests weaknesses in the fraud redressal mechanism.

Table 17. After hearing/experiencing UPI fraud, how has your usage changed

PARTICULARS	COUNT
I stopped using UPI	2
I use UPI cautiously	3
I use UPI less	8
No change	2
TOTAL	**15**

Most affected users reduced or became cautions in their UPI usage. It indicates that fraud experiences negatively influence user behaviour.

8. Hypothesis Testing

H_0 = There is no significant relationship exist between educational qualification and incidence of UPI fraud

Chi-square Contingency Table Test of Independence between Education & Incidence of UPI Fraud

		SSC/HSC	Graduate	Postgraduate or higher	Professional
No	7.0000	7.0000	24.0000	24.0000	12.0000
	5.7195	5.7195	22.8780	25.3293	13.0732
Yes	0.0000	0.0000	4.0000	7.0000	4.0000
	1.2805	1.2805	5.1220	5.6707	2.9268
Total	**7**	**7**	**28**	**31**	**16**
	7	**7**	**28**	**31**	**16**

2.7309	**chi-square**
3.0000	**df**
0.4350	**p-value**

To test above hypothesis Chi-Square test of independence is applied. The calculated Chi-square value is 2.7309 with 3 degrees of freedom and the corresponding p-value is 0.4350. Since the p-value is greater than the standard level of significance (0.5), the null hypothesis is accepted.

This result indicates that educational level lacks a statistically meaningful connection to UPI fraud experiences among participants. In other words, people with varying academic backgrounds appear to be similarly vulnerable to UPI fraud.

H_0 = There is no significant relationship exist between the frequency of using UPI for payments and the incidence of UPI fraud

Chi-square Contingency Table Test of Independence between the frequency of using UPI for payments and the incidence of UPI fraud

		No	Yes	Total
Daily	**Observed**	**44**	**5**	49
	Expected	40.04	8.96	49.00
Few times a week	**Observed**	**9**	**6**	15
	Expected	12.26	2.74	15.00
Occasionally	**Observed**	**7**	**4**	11
	Expected	8.99	2.01	11.00
Rarely	**Observed**	**7**	**0**	7
	Expected	5.72	1.28	7.00
Total	**Observed**	67	15	82
	Expected	67.00	15.00	82.00

10.84	**chi-square**
3	**df**
.0126	**p-value**

To test the above hypothesis Chi-Square test of independence is applied. The calculated Chi-square value is 10.84 with 3 degrees of freedom and the corresponding p-value is 0.0126. Since the p-value is less than the standard level of significance (0.5), the null hypothesis is rejected.

This result indicates that there is a statistically significant relationship between the frequency of UPI usage and the incidence of UPI fraud. The findings suggest that users who engage in UPI transactions more frequently are more exposed to potential fraud risks, while those who use UPI less frequently tend to face fewer fraud incidents. Thus, frequency of usage appears to be an important factor influencing the likelihood of encountering UPI-related fraud.

Conclusion

The study shows that UPI is widely used by users for daily and routine payments such as mobile recharges, bill payments and shopping. Most users have basic knowledge of safe digital payment practices and follow simple safety habits. Yet, numerous users have not come across formal awareness material related to UPI fraud. Although most respondents have not faced UPI fraud, some have experienced fraud, mainly through phishing and fake QR code scams.

The research further reveals that academic background does not affect the chances of facing UPI fraud. In contrast, frequent UPI users are more likely to face fraud risk. Numerous unresolved cases reduced trust and led users to become more cautious or reduce UPI usage.

Overall, the research underscores the need for better awareness, stronger security and improved fraud redressal systems to maintain user trust in UPI.

Limitations

1) A sample size of 82 is a limitation; the findings may differ with a larger sample size.

2) The study is limited to Mumbai suburban areas, i.e., Borivali to Bandra. Other areas are not considered.

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ENHANCING REGIONAL CONNECTIVITY AND ECONOMIC GROWTH THROUGH INFRASTRUCTURE DEVELOPMENT IN SOUTHERN AFRICA - A CASE OF MAPUTO CORRIDOR

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Abstract

Background: *The African continent is endowed with 12% of the world's oil, 8% natural gas, 40% of the world's gold reserves and 90% of chromite and lithium, yet 5% has been exploited. More so it is the largest continent with the most arable land thus agriculture and mining the major economic activities. This has led the world to turn their focus on the continent to exploit the potential. The African Continental Free Trade Area (AFCFTA), therefore is poised to deepen economic integration and foster growth amongst African countries. The key enablers are logistics, Agriculture, and Mining. Logistics plays a pivotal role in realizing this potential for economic integration and growth. As such, it's critical to optimize transport and logistics infrastructure, particularly in regions like Southern Africa, where mining and agriculture are the major economic activities. The use of artificial intelligence technology (AI) in mineral exploration, mining, pharmaceutical and agriculture is going to quicken processes leading to phenomenal output which needs logistics infrastructure. However, logistics infrastructure is still lagging yet it's a key leveraging pillar for the success of AFCFTA objectives.* ***Purpose:*** *This paper investigates the current state and future projections of logistics demand in Southern Africa, driven by burgeoning mineral exports and agricultural activities. It underscores the need for policy adjustments and private sector involvement to ensure efficient logistics networks align with AFCFTA objectives and United Nations Sustainable Development Goals (SDGs). Specifically, it highlights why it is important to open Maputo port to Southern Africa hinterland/land locked countries by road and rail as a strategic initiative to connect to key trade ports to facilitate trade with landlocked countries.* ***Methodology:*** *Qualitative approach was adopted following a multi case study. In-depth interviews were conducted with 20 participants in Logistics (two from governments of Zimbabwe and Mozambique, five freight forwarders, five transporters, two port operators and six cargo owners/traders). Collected data was analysed using thematic analysis highlighting findings from the systematic literature review.*

Results: *The results showed that the opening of Maputo Port to road traffic through the Rutenga/Chokwe will be one of the enablers for connectivity and economic growth for the landlocked countries in the Southern African Development Community (SADC). It will ease congestion at other ports and bring agility and resilience required. Maputo Port will also increase volumes given potentially huge inflows from DRC, Zambia and Zimbabwe.* ***Implications:*** *There are a couple of spinoffs from this development which includes; development of Sango/Chicualacuala into urban centres, employment creation, reduced logistics cost, revenue to both governments, boost tourism to Gonarezhou/Kruger game park etc.*

Keywords: **AFCFTA; SDGs, Logistics Corridors, Logistics Infrastructure, Artificial Intelligence, SADC**

Introduction and Background

The ratification of the African Continental Free Trade Area (AFCFTA) in 2021 marked a significant milestone for African states, heralding the prospect of creating the largest trading bloc in the world (Kuteyi and Winkler, 2022; Joseph, 2023; World Economic Forum, 2023; Nitsche et al., 2024). With an estimated population of 1.4 billion people expected to double by 2050, thus creation of a young population that needs jobs, wealth, political and economic stability(Nitsche et al., 2024; Akoojee, 2024), and a GDP of US$ 3.4 trillion, the AFCFTA aims to forge a single market for goods and services, thereby deepening economic integration across the continent.

Central to the realization of this vision is the optimization of transport and logistics infrastructure, a prerequisite for facilitating trade and fostering sustainable development. Improvements in logistics performance becomes a significant driver of economic growth (Adeleke, 2022; Kuteyi and Winkler, 2022) as the impact of logistics as an enabler is huge(Nitsche et al., 2024). The Sub-Saharan economies still lag behind because of inadequate policy framework, significant infrastructure deficit leading to barriers given broken supply chains (Akoojee, 2024). These challenges have made Africa including Southern Africa's, transportation, port infrastructure, roads, motorways, rail and logistic platforms to have a determining role for the success of AFCFTA. In terms of cost, logistics constitute about 10–15% of the total world gross domestic product (GDP- i.e. transportation(39%), warehousing(27%), inventory carrying(24%), order processing, and administration, this constituting 90% of all logistics cost (Lu & Bock, 2016; Bouazza, Benmamoun & Hachimi, 2019).

Given such pronounced importance of Transport and Logistics in ensuring success of enhancement of regional connectivity and economic growth, a look at logistics corridors is utterly important and alignment to ensure success of the AFCFTA. It has been argued that accelerating AFCFTA goals can be achieved through the optimisation of the digital supply chain(Malatji, 2024; Tsarouhas and Papaevangelou, 2024), however the foundation remains physical infrastructure. World Economic Forum, 2023 reports that, with ratification of AFCFTA, the projected increase in intra-African freight demand is 28%, resulting in demand for almost 2 million trucks, 100,000 rail wagons, 250 aircraft and more than 100 vessels by 2030, thus reducing the cost of logistics which was astronomical historically from large logistics companies. This entails that there is need for expanded connectivity infrastructure in Africa and southern Africa is no exception.

It's in this future prognosis that this paper delves into the imperative for enhancing logistics networks in Southern Africa to align with the objectives of AFCFTA and the UN SDGs, with a specific focus on why the rehabilitation of the Rutenga to Chokwe road to access the port of Maputo for the 6 land locked countries of the region, including DRC given it doesn't a long coastline is one such critical initiative to optimize connectivity in Southern Africa. The region is endowed with minerals - DRC second largest producer of copper in the world and biggest producer of cobalt, Zimbabwe discovery of lithium, platinum, coal and chrome, Zambia second largest producer of copper in Africa. Zimbabwe and Zambia are major agriculture countries in southern Africa surpassed only by South Africa, thus logistics connectivity is crucial as there will be overwhelming demand and need for logistics and transport services will increase as the AFCFTA is implemented and intra-African trade increases (World Economic Forum, 2023).

Transport and Logistics Key Trends

Africa's burgeoning trade landscape underscores the critical importance of robust transport and logistics networks. Presently, African states import approximately $36.8 billion worth of freight annually, with intra-African trade poised for significant growth in the coming years. Projections indicate a 28% increase in intra-African freight demand by 2030, driven primarily by the expansion of mineral exports and agricultural activities(World Economic Forum, 2023). In Southern Africa, the logistics needs are particularly pronounced, fuelled by the region's abundant mineral resources, notably copper, and the burgeoning agriculture

sector. The transport network will exceed its current capacity, the Southern African Development Community (SADC) came up with a regional Infrastructure Development Master Plan projecting, that by 2030, traffic for landlocked SADC countries will increase to 50 million tonnes, ramping to 148 million tonnes by 2040 – an 8.2% annual growth rate; and Port traffic will expand from 92 million tonnes to 500 million tonnes by 2027 (SADC Transport, 2024), such phenomenal growth begs for enhancement of logistics connectivity.

Despite, this realisation about the African continent as the emerging and strategic trading block for Asia and Europe, transport and logistics is riddled with challenges especially infrastructure and social challenges, the key stand out challenges over and above many, includes; poor road network, inadequate rail infrastructure, insecurity, information asymmetry, which is inhibiting connectivity (Kuteyi &Winkler, 2022; Akoojee, 2024). Two broad standing objectives stand out for the development of transport corridors, that being to improve efficiency in the transport and logistics processes, and to generate economic development in the corridor region, as a result of improved connectivity and transport networks (Quium, 2019).

Transport and logistics is the driver/ common denominator for international trade thus plays an important role in the growth and development of any economy (Akoojee, 2024).

A relook at road and rail connectivity is a no brainer. For Southern Africa, all ports are accessible by road and rail into the hinterland and land locked countries. However the shortest access of Maputo port by road and rail for Zimbabwe, Zambia, DRC, Malawi and Botswana is limited or near impassable because of the state of the road. It's against such a background that there is a need for a relook.

Contextualising Maputo Port

The port of Maputo is the largest port in Mozambique, connected by rail and road network - albeit direct to the hinterland in the North. It serves the Mozambique provinces of Maputo and Gaza and offers a short and viable access route for import and export cargoes from South Africa (Gauteng, Limpopo and Mpumalanga provinces mainly), Swaziland, limited on Zimbabwe (Matabeleland) and Botswana, with insignificant or no traffic from Zambia, DRC Malawi. The limiting factor being accessibility by rail only to these countries. The irony however is that the port can't offer its service to the second producer of copper

in the world– DRC at 2.8million tons in 2023 and Zambia's 900,000 tons in the same period. DRC is expected to ramp up to 6million tons with Zambia increasing to 3 million tons in the next 5 to 10 years, thus repositioning of Maputo port strategic.

More than 80% of handled cargo is in transit to/from neighbouring countries. The port is operated by the Maputo Port Development Company (MPDC), a joint venture between CFM and Dubai Port World and recently an extension of the concession was signed to 2058 (MPDC LinkedIn, 2024; Sulayem, 2024). Mozambican ports handled more than 63,000 tons of goods in 2023, an increase of 12.3% compared to 2022(Club of Mozambique, 2024).

There are two main components to the port, the Maputo Cargo Terminals, which include the container, bulk minerals, citrus, sugar and molasses terminals and, 6 km further upriver, the Matola Bulk Terminals with four deep-water berths for handling coal, fuel and lubricants, aluminium and grains.

Problem Statement

Previously labelled predominantly for its expansive landscapes and abundant resources, the African continent has now emerged as an economic powerhouse. With a growing middle-class fueling demand and e-commerce booming, but the biggest slowdown is substantial infrastructure limitations hindering progress (Gautum, 2024). Even though there are visible potential benefits which can be derived from AFCFTA, there still remain challenges, major among them being connectivity in terms of transport and logistics. The effective implementation of AFTCTA policy requires robust improvement in logistics and supply chain infrastructure(Kuteyi and Winkler, 2022; World Economic Forum, 2023; Nitsche et al., 2024). Africa has sixteen land locked countries i.e. have no through coastal access to the sea, and these are Burkina Faso, Mali, Niger, in west Africa, Chad and the Central African Republic in central Africa, east Africa Rwanda, Burundi, Ethiopia, South Sudan, Uganda while in southern Africa its Zimbabwe, Zambia, Swaziland, Malawi, Lesotho, Botswana(Hisseine & Guoxian, 2019). The democratic republic of Congo is not considered landlocked because of 40kms coastline on the Atlantic ocean but it is not feasible to have a port hence for this study it will be considered to have no sea access.

With that in mind Maputo port remains challenging to access by road and robust rail for Zimbabwe, Zambia, DRC and Malawi - yet China and South-East Asia are the

major players in the sector, and with competitive transit times for companies connecting Asia and Africa(World Economic Forum, 2023), connecting Maputo port with all modes of transport is a no brainer–thus key to this equation, hence the study. From the above problemata, the objective and objectives of the paper are started as below;

Objectives

1. To foster regional economic integration by improving transportation links between Maputo Port and Southern Africa landlocked countries of Zimbabwe, Zambia, DRC, Malawi, and Botswana to enhance efficiency of trade and logistics operations, reducing transportation costs and increasing the competitiveness of the involved countries in the global market.

2. To assess the economic development for communities and countries through creation of new opportunities.

Research Questions

RQ1. How can regional economic integration be achieved through the improvement of transportation links between Maputo Port and southern Africa landlocked countries of Zimbabwe, Zambia, DRC, Malawi, and Botswana be achieved, to ensure efficiency of trade and logistics operations to reduce transportation costs and increase the competitiveness on the global market?

RQ2. What new opportunities will be created by making Maputo Port accessible by both road and rail?

Literature Review

Overall, African states currently import $36.8 Billion worth of freight or logistics goods, from passenger freight and transport to parcel and courier services every year from within and outside the continent and will grow. The projection is an increase in intra-African freight demand of 28% leading to additional demand for almost 2 million trucks, 100,000 rail wagons, 250 aircraft and more than 100 vessels by 2030. Maritime trade is projected to increase from 58million to 132 million tons by 2030, this is because of minerals and agriculture. Southern Africa logistics needs will be driven by Minerals especially copper, lithium, coal, chrome etc. and agriculture inputs. The is gradually emerging as an important

trading block strategically in particular for Asia and Europe (Kuteyi and Winkler, 2022; World Economic Forum, 2023)

Southern Africa is endowed with minerals(Kuteyi & Winkler, 2022; Nitsche *et al.*, 2024) major of it being copper and with the advent of electric cars, the demand is phenomenal. DRC has the 7th largest deposits of copper in the world and is now the 2nd largest producer at 2.8 million tons first being Chile(Ensputniknewsafrica, 2024), with plans to ramp up to way above 10million tons by 2050. It is also the biggest producer of cobalt in the world.

On the other hand Zambia plans to ramp their production to 3 million tons by 2035 from the current . Coupled with that, is the growth of agriculture generally in the region for all the countries.

One of the key drivers of economic growth is improved logistics performance, as it is a strategic factor which is an indicator of competitiveness of economies, businesses, including the catalytic factor for job creation and economic growth (Kuteyi & Winkler, 2022). This is because of vast resources, wealth growth and an enlarged middle class with higher purchasing power. Given this phenomenon, there is a requirement to rethink the logistics network in the region.

Logistical Challenges

Despite evidence that African markets are showing that the continent is gradually becoming an important trading block to Asia and Europe, there are still many infrastructural challenges among them bottled necked port operations, expensive but poor inland road quality including inadequate rail capacity, and there is a slow development. This makes Africa a difficult complex terrain for logistics business (Kuteyi and Winkler, 2022; World Economic Forum, 2023), thus inhibiting economic development. More so the African governments have struggled with financing infrastructure, hence the need to rethink how to finance infrastructure development especially the logistic infrastructure (Chilunjika, 2024). The accessibility of all the ports servicing the logistics corridors by both rail and road is important.

Logistics Corridors in Southern Africa

The Southern African Development Community(SADC) is a grouping of 16 countries, whose objective is to achieve development, peace, security and economic growth. It's against

these objectives that SADC needs efficient and effective freight transport systems(Konstantinus et al., 2019) to ensure social integration, economic development and intra-regional trade.

Imports and exports of southern Africa are traditionally done through Durban, Beira, Maputo, Welvis Bay, Richards bay to a large extent. However the growth of mining activities especially the surge in volumes of copper has seen Dar es Salaam, Mombasa, Tanga and Lobito under consideration and use – albeit continued bottlenecks. The shift is because of difficulties in accessibility of the southern African ports and infrastructure, especially roads.

Most ports servicing the region have accessibility through both rail and road networks albeit in unsatisfactory condition, with the exception of the port of Maputo which can be accessed via South Africa road network only, thus making it challenging for movements from Zimbabwe, Malawi, Zambia, DRC and Botswana. Maputo is a deep port which enables the berthing of large vessels so if accessible by road, it positions itself well to compliment Durban, Beira and Richards bay without discounting Mombasa, Tanga, Welvis Bay and Dar Es Salaam because it lays on the Indian ocean which is favourite for eastern world trade given most minerals are exported to China which has 60% of the smelting capacity in world.

Methodology and Data

A qualitative methodology of a multi -case design was used, given that the focus is on the phenomenon occurring in a real world setting and its complexity (Leedy, Ormrod & Ellis, 2015; Saunders, Lewis & Thornhill, 2016; Harrison et al., 2017; Creswell & Creswell, 2018; Yin, 2018). A purposive sample of 20 participants with logistics insight (Creswell and Creswell, 2018; Yin, 2018) - (two from governments of Zimbabwe and Mozambique, five freight forwarders, five transporters, two port operators and six cargo owners/traders) was used and In-depth interviews conducted to collected data which was analysed thematically(Nowell et al., 2017). Document review was complementary to the qualitative methodology.

Results and Discussion

Regional economic integration to hence efficiency of trade and logistics operation to increase competitiveness (RQ1)

How will it be realised?

The distance comparison shown in Table 1 below shows Maputo as ideal for the region, however despite of the ideal location to facilitate trade, the road network between Rutenga in Zimbabwe – 150Kms and Chokwe in Mozambique 275kms needs to be sorted so that accessibility to Maputo port will be done by both rail and road. The Maputo port has seen remarkable growth in volumes driven by minerals, recording 26.7 million tons in 2022 and 31.2 million tons in 2023 mainly from South Africa and partially by rail from Zimbabwe. The projection of growth is 50.9 million tons by 2058, showing the potential of the port should it be accessed by both rail and road.

There has been realization by both the Zimbabwean and Mozambique government that accessibility of Maputo port to the hinterland by both road and rail is critical for logistics and social development.

Table 1 : Southern and Eastern Corridors Distance to Ports

Southern & East African Ports Distance Comparison to Maputo									
	Southern African Ports comparison - Kms						**East African Ports Comparison - Kms**		
City/Centre	**Maputo**	**Beira**	**Lobito**	**Welvis Bay**	**RB**	**Durban**	**Dar**	**Tanga**	**Mombasa**
Kolwezi	2,430	1,910	1,600	2,700	3,005	3,130	2,360	2,500	2,670
Lubumbashi	2,130	1,615	1,900	2,600	2,711	2,870	1,850	2,200	2,375
Harare	1,140	560	2,500	2,300	1,520	1,680	2,500	2,575	2,550
Bulawayo	1,070	860	2,470	1,860	1,305	1,420	3,030	2,880	3,050
Lusaka	1,580	1,050	1,975	2,040	2,250	2,300	1,950	2,100	1,860
Ndola	1,900	1,350	2,010	2,360	2,550	2,610	1,800	1,950	2,115
Blantyre	1,900	690	3,000	2,910	2,180	2,300	1,900	2,000	2,160
Lilongwe	2,300	950	2,690	2,800	2,520	2,500	1,550	1,830	1,860

Source: World Bank (2013) Growth without Borders: A Regional Growth Pole Diagnostic for Southern Africa, Washington, DC: World Bank, No: 84067.

Table 1 shows distance competitiveness to access the ports currently servicing Southern African countries and ultimately while all of them are feasible, accessibility and infrastructure

still needs improvement. Maputo given the recommended link of using Rutenga/Chokwe road stands out more competitive for all cities, via Sango/Chicualacuala border posts, closely followed by Dar es Salaam ONLY on DRCongo and same applies to Lobito but only currently accessible by rail and the infrastructure no way comparable to Maputo. Beira is way ahead in terms of distance saving but it has a big disadvantage of not being a deep port thus restricting large vessel berthing. Infrastructure is also inadequate. Opening Maputo to both rail and road critical pieces will lead to a competitive advantage to both importers and exporters coupled with all the spins below mentioned.

New Opportunities (RQ2)

The proposed rehabilitation of the Rutenga to Chokwe road will have significant spin offs apart from opening accessibility for Maputo Port namely;

- The development of Sango and Chicualacuala into urban centres.
- Closure of the rural/urban divide
- Achievement of one of the UN SDG goals.
- Creation of Dry ports/Customs area for intermodal and storage to service Maputo Port
- Border management facility.
- Truck stop(s).
- Boast to tourism - Accessibility to one of the biggest game parks frontier in the world - The great Limpopo Trans frontier Park straddling on the borders of Mozambique, Zimbabwe and South Africa measuring 35,000kms, thus boasting a tourism industry.

The rehabilitation of the Rutenga (Zimbabwe) - 150kms and Chokwe(Mozambique) – 275km will unlock and optimise the hinterland to Maputo port.The proposed rehabilitation of the Rutenga to Chokwe road presents a significant opportunity to unlock the full potential of Maputo Port and catalyse trade between Southern African countries and the rest of the world. By improving accessibility and reducing transit times, it will not only bolster trade volumes but also stimulate economic development and job creation in the region. Furthermore,

the establishment of supporting infrastructure such as border management facilities and truck stops will further enhance the efficiency of logistics operations and contribute to the achievement of the UN SDGs. The rehabilitation of the Rutenga to Chokwe road entails a comprehensive overhaul of approximately 425 kilometres of roadway, including the development of supporting infrastructure such as border posts and truck parks.

Benefits

- Strengthened economic ties between Maputo Port and the landlocked countries, fostering increased trade and investment.
- Reduction in transportation costs and transit times, making the region more attractive for businesses and investors.
- Job creation and skills development through the construction and maintenance of the road network.
- Improved regional stability and cooperation through enhanced connectivity.
- Revenue to the 2 nations of Zimbabwe and Mozambique.

Policy Implications

The proposed road construction project is a significant opportunity to create a robust logistics corridor connecting Maputo Port with key trading partners in Southern Africa who are landlocked but endowed with large volumes.

However there is need for involvement of the Zimbabwean and Mozambique governments.

Public Private Partnership or alternatively Built Operate transfer will suit this infrastructure development as enshrined in AFTCTA implementation guideline(World Economic Forum, 2023) is the key enabler

Revenue generation

- **Toll collection**
- **Border management fees**

- Inland port/customs area management
- Customs fees
- Share on border management fees
- Fees for government departments like EMA, Port Health, Inspections, Permits etc
- Taxes due as a result of new created employment

The key success factor of the recommended connectivity to land linked countries lies with governments of Zimbabwe and Mozambique willingness to look for suitors to take up the project either PPP or BOT. There are numerous benefits for both governments e.g. security, employment, urbanisation over and above aiding trade. Leveraging the AFTCTA secretariat will be an important piece. Engagement of Maputo port operators and inter modal and multi modal and logistics hub is a prerequisite.

Further Research

This is more of a concept paper with limitations. Research is thin on how transport and connectivity in Africa can be optimised to enhance economic development. The logistics connectivity is more focused on international trade than industrial development and intertrade - all rail and ports lead to the ports. Further research is important

With reference to the Rutenga/Chokwe road connectivity to Maputo Port some of the aspects that need further research includes but not limited to, i.e.

- There is need to research more on the model of financing the project be it PPP or BOT what is agreed on - advantages and disadvantage and how to get the most out of it
- There is need to research on how a Logistics hub will be established at Sango/ Chicualacuala to support movement into Maputo Port.
- There is need for research on how the local community will fit and the benefits derived thereof and how.

Conclusion

In conclusion, the rehabilitation of the Rutenga to Chokwe road represents a transformative opportunity to enhance regional connectivity and foster economic growth in Southern Africa.

This project holds the potential to unlock new avenues for trade and investment, while contributing to the achievement of the UN SDGs.

Traditionally rail has been favoured as alternative to road, however it is unlikely that rail will be a serious competitor to road(Konstantinus et al., 2019) - with statistics showing that rail is doing 30% of imports and exports and the balance of 70% being road. Road and marine time freight transportation offer the biggest opportunity in the short term given that rail and air transportation infrastructure is medium term in terms of infrastructure development. The recommended rehabilitation of the road between Rutenga(Zimbabwe) and Chokwe(Mozambique) that will open the Maputo port to service Zimbabwe, DRC, Zambia, Malawi and even parts of Botswana. While servicing these countries, Maputo port will see increased volumes. The accessibility of Maputo through Sango/Chicualacuala border will be one of the enablers that will open the central and southern Africa hinterland and enhance trade with key spin-offs. Demand for gates away to China for metals has increased. China owns 60% of smelters in the world and with Zambia and DRC ear marking ramping up production – sea ports will be in demand. Zimbabwe is ramping up Chrome, Lithium and construction of Dinson Iron and Steel Company–a subsidiary of China's Tsingshan Holdings Group Limited - the biggest steel plant in Africa is nearing completion. Maputo will suit very well if made accessible by road via Rutenga/Chokwe.

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RURAL MIGRATION AS THE SILENT ENGINE OF URBAN GROWTH WITH THE SPECIAL REFERENCE TO NAVI MUMBAI

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Abstract

This study inspects the quiet but steady influence of rural migration on urban growth, using Navi Mumbai as the specific focus. Over the years, Navi Mumbai has attracted migrants from various rural regions seeking work, education, and better living conditions. To understand this movement in depth, a survey was conducted across all 41 wards of the city. A uniform sample size of 24 respondents per ward was collected, ensuring fair representation of migrant voices throughout the municipal area. The study is grounded in direct interactions and field observations. Migrants shared stories of economic hardship, shifting occupations, housing struggles, and gradual adaptation to city life. Most were engaged in unorganised sectors construction, domestic help, vending, and transport yet their contribution to the functioning of the city remains unnoticed by formal systems. What stood out was the resilience of migrant families and their efforts to find stability without much institutional support. Their settlements often lack formal infrastructure, but they remain active participants in the city's informal economy and labour markets. This paper argues that rural migrants, though often overlooked, are not just passive settlers but active contributors to urban progress. Their movement into the city is not temporary or accidental; it reflects a long-term shift that needs to be understood for more inclusive urban development strategies, especially in fast-growing cities like Navi Mumbai.

Keywords: **Rural-to-Urban Migration, Socio-Economic Transformation, Navi Mumbai, Urban Settlements, etc.**

Introduction

Migration is not just a movement from one place to another; it is "a struggle to belong in spaces that are constantly shifting" (Bhattacharyya, 2018). In a city like Navi Mumbai, the stories of migrants are often written in labour but rarely recorded in planning documents. Built as a counter-magnet to Mumbai, Navi Mumbai has absorbed waves of rural migrants seeking work, stability, and survival. According to Census 2011, around 37%

of Maharashtra's urban growth stemmed from rural-to-urban migration. Within Navi Mumbai, multiple informal settlements have emerged near industrial belts, construction zones, and transport hubs areas rarely examined in official reports. Government sources provide broad figures, but they fail to show how migration functions at the micro-level. Wards differ in population density, infrastructure access, and employment types. This study conducted detailed surveys in 8 main wards, selecting 24 samples from each, capturing a variety of occupations, languages, family patterns, and housing arrangements. Most respondents were first-generation migrants navigating unstable jobs in the informal sector. Books like The Great Indian Migration Wave (Tumbe, 2018) point out that "cities grow, not just by design, but by absorption." This study builds on that idea by documenting how Navi Mumbai's growth is not only driven by formal plans but also by the steady efforts of those who arrive quietly, settle gradually, and contribute consistently to the city's daily life.

Objective of the study

1. To understand the socio-economic conditions of rural migrants in selected wards of Navi Mumbai.

2. To examine the role of rural migrants in contributing to the informal urban economy

Hypothesis

H_o (Null Hypothesis): Rural migration does not have a significant impact on the urban growth of Navi Mumbai.

H (Alternative Hypothesis): Rural migration has a significant impact on the urban growth of Navi Mumbai.

Literature Review

Scholarly work on migration in India often highlights patterns of distress-led movement rather than choice-driven relocation. Dandekar and Bhagat (2004) emphasized that rural-to-urban migration in Maharashtra is largely linked to agrarian distress and shrinking rural livelihoods. Tumbe (2018), in his study of internal migration, explained that Indian cities function as "shock absorbers" during rural economic stress absorbing labour when agriculture fails to provide. More specific studies on Navi Mumbai remain limited, although urban studies scholars like Bhide and Mehta (2011) have pointed out the growing gap between

infrastructure development and migrant inclusion. Studies by TISS and local civic bodies have intermittently covered housing conditions and informal work, but often without a longitudinal or ward-specific focus.

Earlier frameworks on migration in India (e.g., Todaro's model) focused on income differences between rural and urban areas. However, recent studies have shifted toward lived experiences, social adaptation, and intergenerational mobility. Publications by the Centre for Equity Studies argue that city-making processes in India often exclude migrants from formal recognition even when their work sustains the urban economy. This paper builds on these studies but attempts a more grounded view through field-based evidence from selected wards in Navi Mumbai.

Scope of the Study

The present study focuses on understanding the socio-economic dimensions of rural-to-urban migration with special reference to Navi Mumbai. It specifically considers the eight main wards within Navi Mumbai Municipal Corporation, where structured surveys were conducted by collecting 24 samples from each ward. The study concentrates on the lived experiences of migrant individuals and households, their employment patterns, income shifts, housing arrangements, and access to basic services in the urban setting. It restricts itself to first-generation rural migrants who have shifted to Navi Mumbai within the last 15 years. While the broader phenomenon of migration is influenced by various structural and individual-level factors, the study confines its attention to those migrants whose primary reason for migration was employment, better living conditions, or socio-economic mobility. Government schemes, civic infrastructure, and policy interventions affecting the migrant population also fall within the scope of inquiry. However, inter-state migration, seasonal migration patterns, and refugees or forced migration groups have not been included in this research. The study's scope does not cover comparative analysis with other urban centers, as the primary intention is to gain localized insights that could support urban policy decisions within Navi Mumbai. By narrowing the scope geographically and demographically, the research aims to provide focused, data-driven insights that can assist urban planners, municipal authorities, and social researchers in understanding the nature and needs of migrant populations in rapidly urbanizing zones.

Research Methodology

The present study adopts a descriptive and empirical approach to understand how rural migration contributes to urban growth in Navi Mumbai. Primary data was collected through structured surveys conducted in 8 main wards of Navi Mumbai Municipal Corporation (NMMC). From each ward, 24 respondents were selected using purposive sampling to ensure that only rural migrants who had relocated within the last two decades were included. Fieldwork involved door-to-door interactions, using a semi-structured questionnaire covering aspects such as employment type, income range, housing conditions, access to basic services, duration of stay, and reasons for migration. Responses were cross-verified where possible with local officials and ward-level data.

Secondary data was drawn from Census 2011, NMMC reports, and academic publications related to urban migration. Qualitative inputs were gathered through informal conversations with community leaders, local vendors, and municipal staff to understand the social fabric of migrant settlements. The collected data was analysed using basic statistical tools like percentages and cross-tabulations. Patterns of occupation, mobility, income, and access to amenities were compared across wards to identify variations in migrant experiences. This mixed-method approach allowed the study to move beyond generalisations and focus on the actual conditions of migrants who form an invisible yet active part of Navi Mumbai's urban system.

Data Analysis and Interpretation

The data tells that a majority of migrants (62%) relocated due to economic distress, mainly resulting from declining agricultural income, lack of rural employment, and uncertain seasonal work. These migrants are now part of the informal workforce in Navi Mumbai taking up roles in construction, waste collection, vending, transport services, and domestic work. While their jobs remain low-paying and insecure, their presence supports the functioning of the city's essential sectors.

Table 1

Primary Reasons for Rural Migration and Their Connection to Urban Contribution in Navi Mumbai

Reason for Migration	No. of Respondents	Percentage (%)	Observed Urban Contribution
Economic Distress	119	61.98%	Engaged in construction, daily wage labor
Education Opportunities	29	15.10%	Supporting private tuition sector, school jobs
Health and Medical Access	17	8.85%	Usage of urban healthcare systems
Family/Marital Reasons	27	14.06%	Homemakers, self-help groups, social care roles
Total	**192**	**100%**	

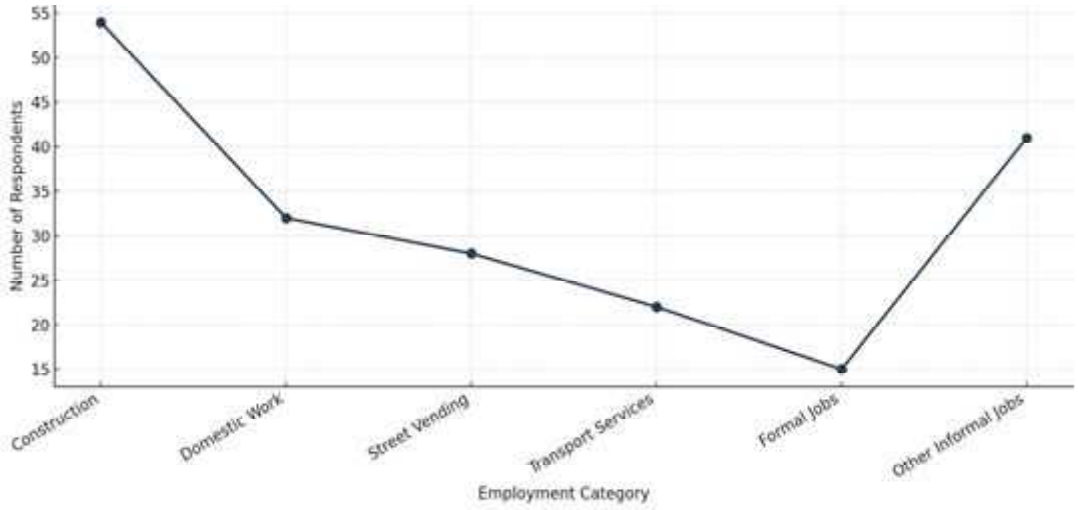
Source: Primary Field Survey (8 Wards, N = 192)

Migrants seeking education and healthcare access form another important group. Their movement reflects not only personal aspirations but also growing trust in urban systems. In doing so, they contribute indirectly to the city's educational institutions, private clinics, and low-cost service sectors. Women who migrated for marital or family reasons often enter informal caregiving, tailoring, or join self-help groups quietly filling gaps in community-level support structures.

Though their migration may not be officially counted in urban growth statistics, their economic and social roles prove crucial in the city's everyday life. These findings support the alternative hypothesis that rural migration plays a significant role in shaping urban growth, especially in cities like Navi Mumbai that rely on flexible, low-cost labour for infrastructure, services, and development. Their contribution is not only economic but also social, helping the city expand in ways that formal plans and documents often ignore.

Graph 1

Migrant Employment Types in Navi Mumbai



Source: Primary Field Survey (8 Wards, N = 192)

The line graph reflects how rural migrants have become a steady part of Navi Mumbai's informal workforce. A striking 54 respondents reported working in construction, indicating their strong role in supporting the city's infrastructure expansion. Domestic work and street vending followed with 32 and 28 respondents respectively, suggesting a consistent demand for services tied to household support and street-level retail. Transport services employed 22 individuals, many of whom work as rickshaw drivers, loaders, or delivery helper's roles that help keep the city mobile. Formal jobs were the least common, with only 15 respondents managing to access employment with regular pay and some job security. These were largely contractual positions such as security guards or cleaning staff.

The "Other Informal Jobs" category had 41 responses, indicating the rise of flexible and survival-based work like scrap collection, small-time repair services, or shop assistants. This uneven access to stable jobs points to a labour system that absorbs rural migrants but offers little in terms of upward mobility or formal recognition. The pattern observed in the graph supports the idea that rural migrants are essential to keeping Navi Mumbai functioning daily yet their roles often go unnoticed in formal economic planning. Their presence sustains several sectors that depend on affordable and reliable human effort.

Employment types among rural migrants vary across the 8 wards surveyed in Navi Mumbai. Construction work is dominant in Turbhe (9), Belapur (8), and Koparkhairane (8),

underlining the demand for physical labour in areas undergoing steady real estate and infrastructure development. These locations are known for either industrial zones or ongoing commercial projects that attract a higher volume of migrant labour.

Table 2

Cross-Tabulation of Migrant Employment by Ward in Navi Mumbai

Employment Type	Vashi	Nerul	Belapur	Airoli	Turbhe	Ghansoli	Kopar khairane	Digha	Total
Construction	7	6	8	6	9	5	8	5	54
Domestic Work	4	5	3	5	4	4	4	3	32
Street Vending	3	4	3	4	4	3	4	3	28
Transport Services	2	3	3	2	3	3	3	3	22
Formal Jobs	1	2	2	2	2	2	2	2	15
Other Informal Jobs	5	6	4	6	5	5	5	5	41
Total	22	26	23	25	27	22	26	21	192

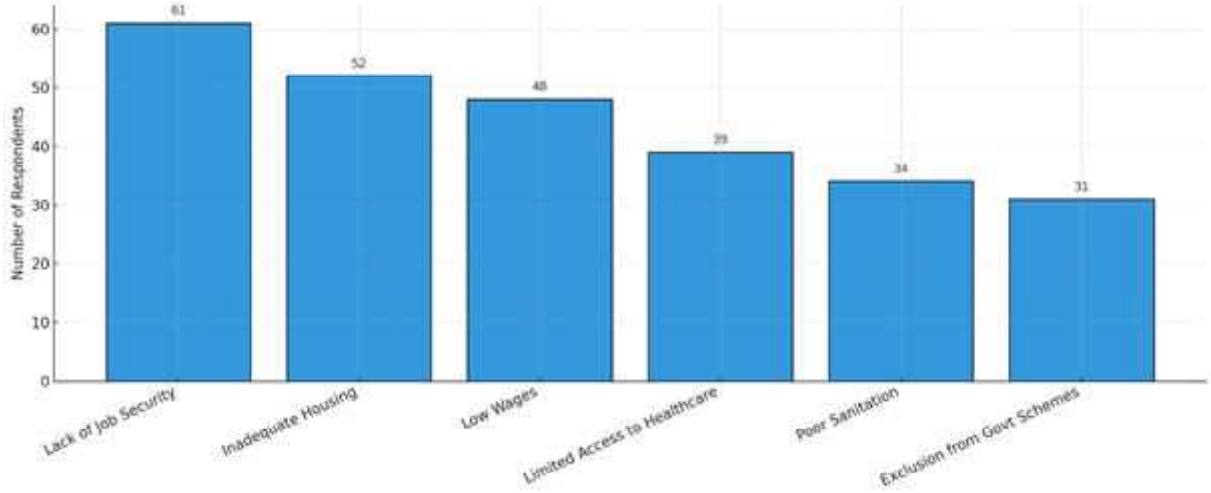
Source: Primary Field Survey (8 Wards, N = 192)

Domestic work appears consistently in all wards, with a slight concentration in Nerul (5) and Airoli (5), suggesting a steady requirement for household help in residential middle-class neighborhoods. Street vending follows a similar trend, showing equal spread across most wards, indicating that this form of self-employment is popular wherever public footfall is consistent like near markets, stations, and busy roads. Transport services show slightly lower but stable figures across all wards, with most respondents working as drivers, loaders, or in delivery-based roles. Formal jobs have the lowest numbers, and are evenly distributed, indicating limited entry for migrants into secure employment regardless of location. The "Other Informal Jobs" category, which includes a wide range of unclassified low-income activities, is highest in Nerul (6) and Airoli (6), hinting at local demand for flexible and auxiliary services. This table supports the finding that while employment opportunities exist in all wards, migrants are mostly absorbed into sectors that offer low stability and high physical input, with little variation in access based on geography.

The primary hardships experienced by rural migrants across eight major wards of Navi Mumbai. The most frequently reported issue is the lack of job security, cited by 61 respondents. This suggests a prevailing trend of informal or contract-based employment where layoffs, unstable wages, and absence of benefits are common.

Graph 2

Challenges Faced by Rural Migrants in Navi Mumbai



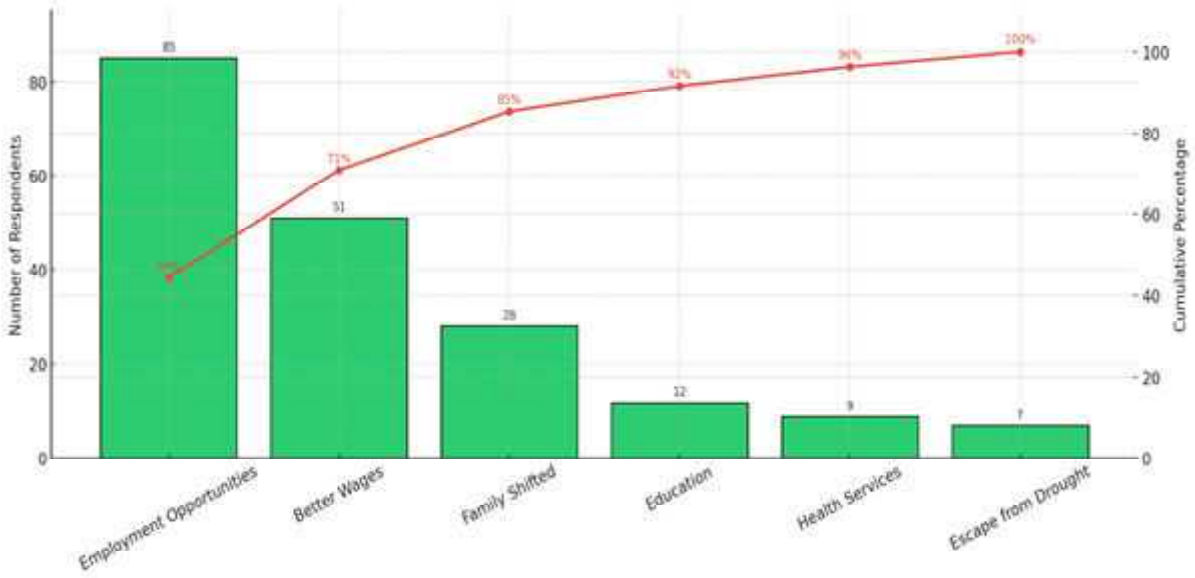
Source: Primary Field Survey (8 Wards, N = 192)

Inadequate housing ranks second, with 52 migrants expressing concern. Many reside in congested settlements or informal dwellings without basic civic amenities. Low wages, reported by 48 respondents, shows that even when employment is available, it does not always translate into financial sustainability. Limited access to healthcare affects 39 individuals. Many migrants are either uninsured or unable to afford medical treatment, and some avoid public healthcare due to lack of documentation or awareness. Poor sanitation and exclusion from government schemes reported by 34 and 31 migrants respectively suggest neglect in both infrastructure and institutional support. This data points to a pattern of economic and social vulnerability among migrants. Most challenges arise from systemic neglect, insufficient policy outreach, and the informal nature of their work. These issues aren't isolated, they are interlinked and tend to reinforce each other, making the urban experience of rural migrants uncertain and difficult. Addressing any one of these concerns without considering the others may result in limited improvements.

The chart shows below that employment opportunities stand out as the most dominant reason, mentioned by 85 respondents, which accounts for nearly 44% of the total. This clearly suggests that the urban job market acts as a primary magnet for rural migration.

Graph 3

Reasons for Migrating to Navi Mumbai



Source: Primary Field Survey (8 Wards, N = 192)

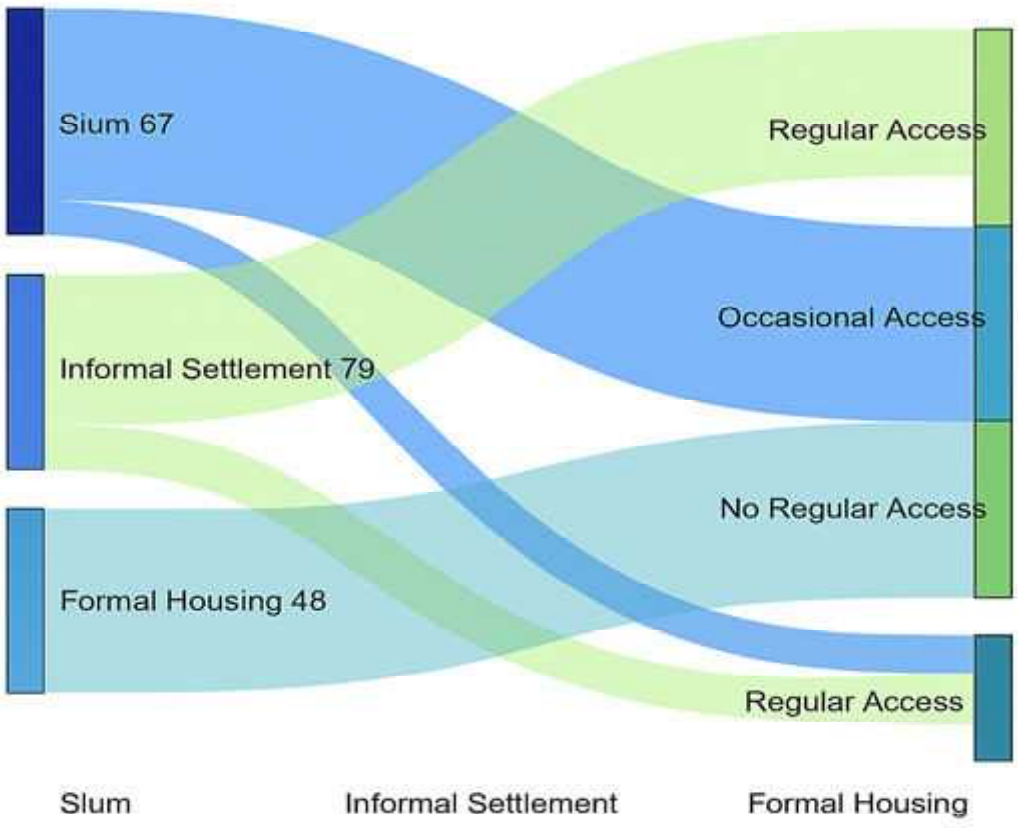
Following this, better wages motivated 51 migrants, showing that people not only seek jobs but also expect a higher standard of living through improved income. Together, these two reasons make up about 71% of all responses, indicating that economic factors are the strongest pull. Family relocation comes next with 28 respondents, which may reflect chain migration, where individuals move after family members have already settled. This is followed by education (12) and health services (9) both showing that social development factors, though important, are secondary in driving migration.

The least mentioned reason, escape from drought, was cited by 7 individuals, suggesting that environmental displacement is present but not as widespread in this sample. The cumulative percentage line reinforces the 80/20 principle around three primary reasons that account for the bulk of decisions to migrate. This finding highlights the need for policies that improve employment and income conditions in rural areas to slow down migration pressure on urban zones like Navi Mumbai.

The flow of rural migrants into different types of housing and their access to basic urban services in Navi Mumbai. It visually represents how housing conditions are directly tied to service accessibility, reflecting the uneven urban experience for migrants.

Graph 4

Housing Type and Service Accessibility of Migrants in Navi Mumbai



Source: Primary Field Survey (8 Wards, N = 192)

The chart begins with three housing types: slum housing, rented chawls, and temporary shelters. A significant portion of migrants in slum housing are shown to have limited access to sanitation and clean water, with many still relying on shared or community-based facilities. Migrants living in rented chawls experience relatively better conditions, though some still lack proper drainage or consistent water supply. Those in temporary shelters, often informal or roadside setups, are the most vulnerable. The chart shows that most of them fall into the category of no access to reliable electricity and unsafe drinking water, underlining the

precarious nature of their living environments. The visual clearly separates those with partial access and no access to key services, emphasizing how housing type becomes a strong indicator of service deprivation. It reinforces the need for improved urban planning, equitable service distribution, and housing regulation reforms to ensure that incoming migrant populations are not trapped in cycles of poverty due to substandard living conditions.

Findings

1. A large portion of rural migrants arriving in Navi Mumbai are economically motivated, with over 70% citing employment opportunities and better wages as their primary reasons for migration. The employment sectors they integrate into vary by skill level—construction work, domestic help, factory jobs, and vending being most common. Skilled workers remain a smaller fraction of the total migrant pool.

2. Income levels among migrants reflect substantial variability. Nearly 40% of them earn below ¹ 10,000 per month, while only 15% cross the ¹ 20,000 mark, indicating persistent income insecurity among a majority of them. Housing type plays a major role in determining access to basic urban services. Migrants living in slum housing and temporary shelters experience more deprivation compared to those in rented chawls.

3. The occupational outcomes of migrants are not evenly distributed and are influenced by educational background, social networks, and ward-level opportunities. The statistical trends and graphical representations strongly support a pattern where migration is linked with specific forms of urban growth, particularly through labor absorption in informal sectors.

4. **Hypothesis Testing Result**. Based on the empirical data gathered from 8 key wards in Navi Mumbai and corresponding analysis, the null hypothesis is rejected. This confirms that there is a significant relationship between rural migration and urban growth patterns in Navi Mumbai.

Discussion

The findings make it clear that rural migrants play an active role in the functioning of Navi Mumbai's economy. Their presence is most visible in informal employment sectors, which absorb a large part of the incoming labor. This pattern suggests a continued reliance

on migrant workers to meet urban demand, especially in roles that are often overlooked by formal labor markets. The study's data indicates that migration is not driven by a single cause. While economic reasons dominate, personal networks and urban pull factors also contribute. Migrants often rely on relatives or acquaintances already settled in the city, making certain wards more densely populated by specific communities. This clustering is reflected in the ward-wise employment trends, where construction and vending jobs are concentrated in specific zones.

Housing continues to be a major challenge. Migrants living in slum clusters or makeshift dwellings often lack proper access to clean water, sanitation, and reliable power supply. These conditions directly affect their quality of life and raise questions about how cities like Navi Mumbai can provide more inclusive infrastructure without pushing vulnerable groups to the margins. The hypothesis testing confirms that migration is significantly linked to the city's growth. This suggests that migration must be seen not as a burden, but as a process that contributes to urban functioning. Recognizing this may lead to better policies that factor in housing, employment, and service delivery for migrants.

Conclusion

This study confirms that rural migration is closely connected to the growth of Navi Mumbai, particularly through its contribution to informal labor markets. Migrants are not only filling essential roles in the city's workforce, but are also reshaping the population structure of several wards. Their movement is largely motivated by economic necessity, and yet their settlement patterns reflect the uneven access to housing and public services. The research, based on primary data from 8 major wards, shows that the quality of life for many migrants remains limited by low income, temporary shelter, and restricted access to basic needs. These realities underline the importance of understanding migration not just as movement, but as a process that places long-term demands on urban resources. The rejection of the null hypothesis supports the idea that rural-to-urban migration is strongly linked to urban growth, both socially and economically. As Navi Mumbai continues to develop, it becomes essential to recognize the contribution of migrants and work toward policies that include them in the city's planning, services, and future development. This study offers a starting point for further research and discussion on how cities can better respond to migration not through restriction, but through support and inclusion.

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SUSTAINABLE DEVELOPMENT GOALS (SDG's) AND NATIONAL EDUCATION POLICY (NEP 2020): A COLLABORATIVE APPROACH

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Abstract

This paper examines the convergence between India's National Education Policy (NEP) 2020 and the Sustainable Development Goal No. 6, and examines the need for quality education which is both inclusive and equitable. Using secondary data from government reports and international sources, the study examines trends in enrollment, dropout rates, gender parity, and higher education to assess India's progress toward SDG 4. Findings indicate notable improvements in educational access and gender parity, driven by initiatives like the Right to Education Act as well as the digital learning programs. However, challenges such as regional disparities, limited infrastructure, and the digital divide continue to impede progress. The paper highlights the transformative potential of NEP 2020 reforms, including foundational literacy, early childhood education, vocational skills, and teacher development, in bridging these gaps and promoting inclusive education across India.

Keywords: **Inclusive Education, Gender Parity, Vocational Skills, Digital Divide, Lifelong Learning.**

Introduction

India's education system is among the largest globally, encompassing over 1.5 million schools and more than 39,000 higher education institutions (UDISE+, 2021-22; AISHE, 2020-21). Serving a diverse population across socio-economic, linguistic, and cultural backgrounds, the system aims to provide comprehensive educational opportunities from primary education to tertiary education. Renowned higher education institutions like Indian Institutes of Management and Indian Institutes of Technology contribute towards producing highly skilled professionals who are globally recognized.

The system emphasizes science, mathematics, and technology, preparing a workforce capable of driving innovation and industry growth, particularly in IT and engineering. Additionally, India promotes cultural heritage and multilingual education, fostering inclusivity

and broad-based learning. Policies such as the RTE Act along with the digital learning initiatives demonstrate India's commitment to improving accessibility and equity in education.

Despite these advancements, challenges remain. Rural and marginalized communities often face limited access to quality education, particularly for girls. Issues such as outdated curricula, inadequate infrastructure, teacher shortages, and mismatches between education and industry requirements hinder student outcomes.

Objectives of the Study

1. To examine the conceptual and policy alignment between SDG 4 (Quality Education) and India's National Education Policy (NEP) 2020.
2. To analyze India's educational progress in relation to SDG 4 targets using key indicators such as enrollment, dropout rates, and gender parity.
3. To identify challenges impeding the achievement of equitable and quality education.
4. To assess NEP 2020's role in promoting inclusive, lifelong learning.
5. To suggest policy measures for enhancing NEP–SDG synergy.

Role of the Study

The study serves as an analytical bridge between global educational goals and national education reforms. It plays multiple academic and policy roles:

1. Interpretive Role: To interpret the conceptual convergence between NEP 2020 and SDG 4 within India's socio-economic context.
2. Analytical Role: To analyze quantitative indicators of educational development drawn from credible data sources such as UDISE+, AISHE, and NITI Aayog reports.
3. Reflective Role: To encourage reflection on how education serves as a driver for other SDGs including gender equality (SDG 5) and economic growth (SDG 8).
4. Policy Role: To contribute insights for policymakers and educators on how NEP implementation can advance the 2030 Agenda for Sustainable Development.

Review of Literature

Education's role in achieving sustainable development has been widely emphasized in global and national scholarship. UNESCO (2020) highlights that quality education not only improves individual outcomes but also fosters gender equality and economic stability. Tilak (2018) and Sen & Dreze (2013) argue that education is a foundational driver of human development and social justice.

Rao and Rao (2020) interpret NEP 2020 as a policy that emphasizes holistic learning, multilingualism, and vocational skills—key enablers of SDG 4. Similarly, Choudhury and Bhattacharya (2021) recognize NEP's alignment with the SDGs but caution that successful implementation depends on financial and institutional capacity.

Studies by Hooda (2016) and Sharma & Sharma (2022) underscore that inclusion and access remain critical challenges. They call for targeted strategies to reach marginalized populations, particularly women and rural learners. Mishra and Garg (2021) highlight that the pandemic exposed digital inequalities, which, if unaddressed, can reverse educational progress.

The literature also underscores how India's National Education Policy (NEP) 2020 operationalizes this vision within a national framework, aligning educational reform with global sustainability objectives.

The National Education Policy (NEP) 2020: Framework and Vision

The National Education Policy (2020) represents a paradigm shift in India's educational landscape. It envisions transforming the country into a "knowledge society" through holistic, multidisciplinary, and skill-oriented learning. According to Rao and Rao (2020), NEP 2020 emphasizes flexibility, experiential pedagogy, and foundational literacy—principles that directly correspond to SDG 4 targets on lifelong learning and quality education.

Choudhury and Bhattacharya (2021) critically assess NEP 2020's alignment with the SDGs, concluding that the policy reflects strong conceptual harmony with global educational objectives but faces practical challenges in implementation, especially in ensuring inclusivity and reducing regional inequalities. Similarly, Tilak (2020) highlights internal contradictions within NEP 2020, particularly the tension between privatization trends and the goal of universal access.

Education for Inclusivity and Equity

Hooda (2016) and Sharma and Sharma (2022) emphasize that educational inclusivity is integral to both NEP 2020 and SDG 4. Hooda (2016) notes that socio-economic disparities, gender inequality, and urban–rural divides have historically constrained equitable access to education in India. NEP 2020 seeks to overcome these barriers through targeted interventions for disadvantaged groups, gender-sensitive pedagogy, and flexible learning pathways. Sharma and Sharma (2022) further argue that higher education institutions play a critical role in fostering sustainable development through innovation, research, and global partnerships—key components also embedded in SDG 17.

Digital Learning and the Technological Divide

The COVID-19 pandemic accelerated the digitalization of education, but it also revealed stark inequalities in access. Mishra and Garg (2021) document the deepening digital divide in India, which disproportionately affected students from rural and low-income households. While initiatives such as DIKSHA, ePathshala, and PM eVidya expanded remote learning opportunities, inadequate digital infrastructure and teacher training hindered effectiveness. This finding aligns with UNESCO's (2020) concern that digital transformation, if not inclusive, can exacerbate rather than reduce inequality.

Progress and Policy Integration

According to the Unified District Information System for Education Plus (UDISE+) (2022) and the NITI Aayog SDG Index (2023), India has achieved notable improvements in Gross Enrolment Ratio (GER), Gender Parity Index (GPI), and dropout reduction. However, the Sustainable Development Goals Report (2024) indicates that global educational progress remains fragile, urging accelerated policy action and investment. These studies collectively suggest that NEP 2020's successful implementation is essential for India's sustained progress toward SDG 4 by 2030.

Critical Gaps in Literature

While the reviewed studies collectively affirm a strong theoretical and structural link between SDG 4 and NEP 2020, several research gaps persist. Most analyses focus on policy intent rather than implementation outcomes. There is limited longitudinal evidence assessing how NEP reforms tangibly impact learning outcomes, employability, and inclusivity.

Additionally, few studies adopt a reflective lens to evaluate the broader interconnections between education and other SDGs, such as gender equality (SDG 5), economic growth (SDG 8), and reduced inequalities (SDG 10). This paper seeks to address these gaps by offering an integrated and reflective discussion of the NEP–SDG interface in India.

The existing body of literature demonstrates that NEP 2020 and SDG 4 share a common developmental philosophy grounded in equity, inclusion, and quality. However, while the conceptual convergence is clear, practical alignment remains an ongoing challenge. The reviewed works underscore that achieving sustainable education outcomes depends on adequate financing, teacher capacity, digital readiness, and community engagement. This study builds upon these insights to evaluate how India's educational reforms contribute to the larger global agenda for sustainable development.

Research Methodology

This study adopts a descriptive and analytical approach using secondary data from credible sources such as UDISE+ (2022), AISHE (2021), and NITI Aayog SDG Index (2023). Policy documents, including NEP 2020 and UN SDG Reports (2015–2024), were analyzed alongside scholarly works (Tilak, 2020; Mishra & Garg, 2021). Data trends related to enrollment, dropout rates, gender parity, and higher education were interpreted to evaluate the policy's alignment with SDG 4.

Findings and Discussion

Global Indicator Framework (GIF) for SDGs

In March 2015, the United Nations Statistical Commission (UNSC) established the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) with the primary responsibility of developing a robust mechanism for tracking the progress of the 2030 Agenda for Sustainable Development. The group consists of Member States as its main decision-making body, while regional and international agencies participate as observers, ensuring a balanced representation of global perspectives. One of its key mandates is the formulation and implementation of the Global Indicator Framework (GIF), a standardized set of indicators designed to monitor the advancement of each Sustainable Development Goal (SDG) and its respective targets. This framework serves as the foundation for measuring progress across nations, enabling comparability, accountability, and evidence-based policymaking at both national and international levels.

National Indicator Framework

Gross Enrolment Ratio

School enrolment is another important aspect of education that is characterized by its Gross Enrolment Ratio (GER) which measures a general population based on the types of educational gain i.e. those that can reach primary, secondary and tertiary education. It is obtained by taking the number of students enrolled in a specific level of education (e.g., primary education comprising Grades 1 to 5) divided by the number of people belonging to the respective age group (6–10 years and older) multiplied by 100.

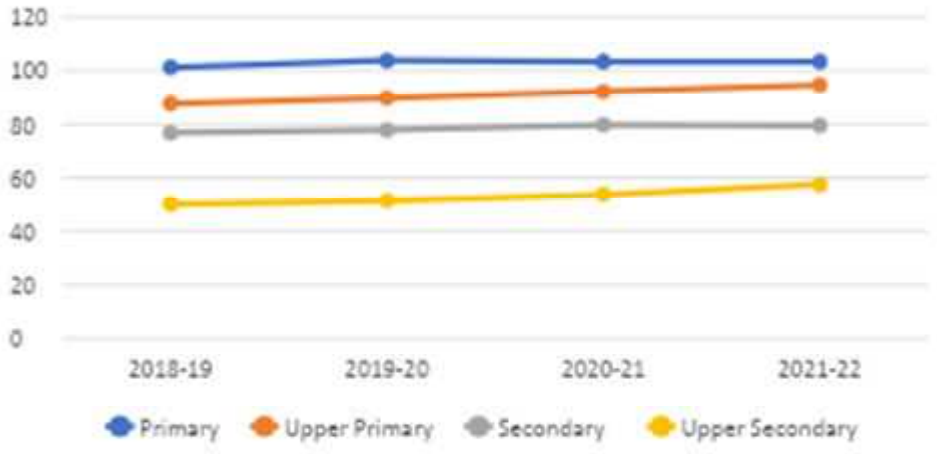
Table 1

Gross Enrolment Ratio in Schools*

Year	Primary level (year 1-5)	Higher Primary level (year 6-8)	Secondary level (year 9-10)	Higher Secondary (level 11-12)
2018-19	101.3	87.7	76.9	50.1
2019-20	103.7	89.7	77.9	51.4
2020-21	103.3	92.2	79.8	53.8
2021-22	103.3	94.67	79.56	57.5

Figure 1

Gross Enrolment Ratio in Schools



Source: Unified District Information System available for Education data (Yr 2021 - Yr 2022)

Total School Enrolment

Total school enrolment has shown a general increase; however, a downturn is evident following the 2020-2021 academic year, which aligns with the widespread effects of the pandemic. Specifically, enrolment in upper primary education grew from 6.4 million in the 2018-2019 academic year to a level of 6.68 million in year 21-22. Likewise, Upper secondary school enrolment rose from a level of 2.6 million in year 18-19 to a level of 2.86 million in year 21-22. In contrast, enrolment numbers for pre-primary, primary, and secondary education saw a decline, falling from 1.06 million, 12.2 million, and 3.9 million in 2020-2021 to 0.95 million, 12.18 million, and 3.85 million in 2021-2022, respectively.

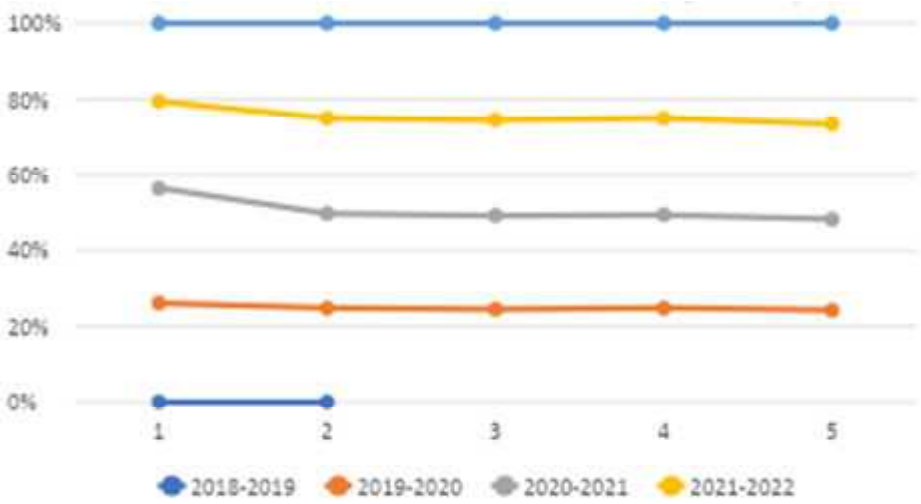
Table 2

Overall Student Enrolment in Schools (Crores)*

Academic Year	Upper Primary	Primary level (year 1-year 5)	Higher or Primary (year 6-year 8)	Secondary level (year 9-year 10)	Higher Secondary level (year 11-year12)
2018-2019	1.2	12	6.4	3.8	2.6
2019-2020	1.4	12.2	6.5	3.8	2.6
2020-2021	1.06	12.2	6.6	3.9	2.7
2021-2022	0.95	12.18	6.68	3.85	2.86

Figure 2

Overall Student Enrolment in Schools (Crores)



Source: Unified District Information System available for Education data (year 2021- year 2022)

School Dropout Rate

Dropout rates in basic education have been reduced from the level of 4.5% as seen in the 2018-2019 academic year to 0.8% in 2020-2021. However, it increased in the following year, and the rate increased to the level of 1.45% in the years 21-22. In higher primary education, the dropout rate decreased from the level of 4.7% in year 18-19 to a low of 1.9% in year 20-21, but similarly, it rose to 3.02% the very next year. The dropout rate in secondary education decreased from 17.9% in the year 2018-2019, increasing to 14.6% in the year 2020-2021; however, it also increased to 12.61% the following academic year.

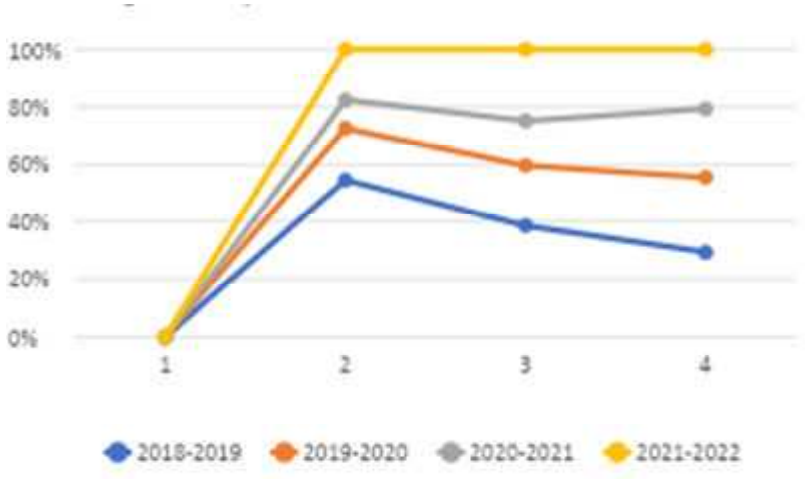
Table No. 3

School Education Dropout Rate

No. of Years		Primary level (year 1- year 5)	(year 6-year 8)	(Year 9- Year 10)
2018-2019		4.5	4.7	17.9
2019-2020		1.5	2.6	16.1
2020-2021		0.8	1.9	14.6
2021-2022		1.45	3.02	12.61

Figure 3

Drop Out Rate in School Education



Source: Unified District Information System for Education data (2021-22)

Gender Parity Index

The Gender Parity Index shows improvement in all different levels of schooling: nevertheless, the latest trend was observed to continue downward from the year 2020-2021. Under upper primary education, the GPI declined significantly from 1.02 in 2019-2020 to 1.00 in 2021-2022. Under secondary education, the GPI declined from 1.00 in 2019-2020 to 0.99 in 2020-2021 but gained back in the year 2021-2022. On the contrary, higher secondary education GPI has risen in 2019-2020 but has declined to 1.02 in 2021-2022 from the benchmark established in 2019-2020 at 1.04.

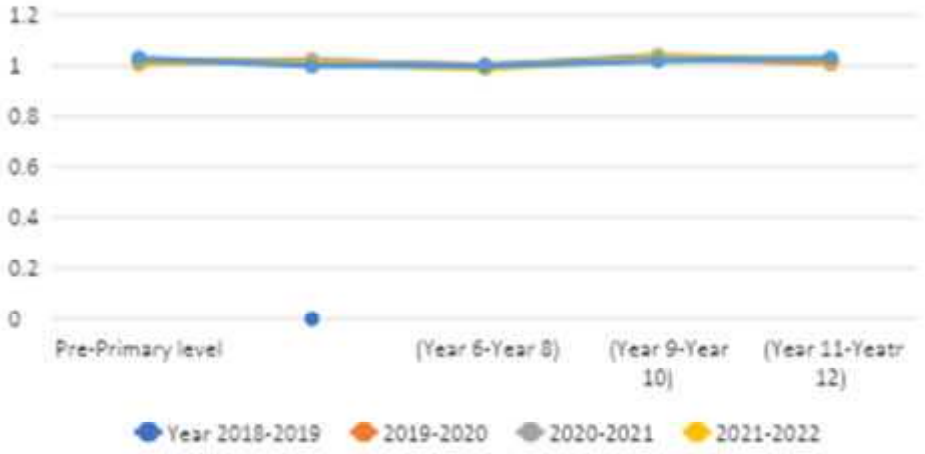
Table No. 4

GPI at Gross Enrolment Ratio across All Categories

No. of Years	Pre-Primary	(Year 1-Year 5)	(Year 6-Year 8)	(Year 9-Year 10)	(Year 11-Year 12)
Year 2018-2019	1.01	1.02	1.00	1.03	1.01
2019-2020	1.02	1.02	1.00	1.04	1.02
2020-2021	1.02	1.01	0.99	1.03	1.02
2021-2022	1.03	1.00	1.00	1.02	1.03

Figure 4

GPI at Gross Enrolment Ratio across All Categories



Source: Unified District Information System available for Education data (year 2021- year 2022)

Trends in Higher Education

India has achieved substantial progress in higher education. The estimates of Gross Enrolment Ratio (GER) rose from 12.3 in 2006–07 towards 27.01 in 2019–20, indicating a steady upward trajectory as illustrated in the chart.

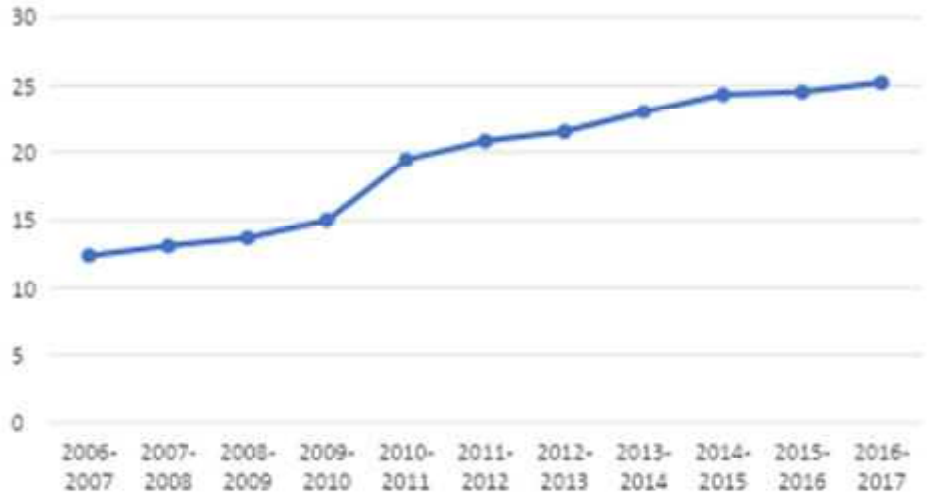
Table No. 5

Trend of Gross Enrolment Ratio in Higher Education (Ages 18–23)

Year	GER
2006-2007	12.39
2007-2008	13.1
2008-2009	13.7
2009-2010	15
2010-2011	19.4
2011-2012	20.8
2012-2013	21.5
2013-2014	23
2014-2015	24.3
2015-2016	24.5
2016-2017	25.2

Figure 5

Gross Enrollment Ratio



Source: Unified District Information System available for Education data (year 2021- year 2022)

Student enrolment in higher education has grown steadily, increasing from 15.5 million in 2006–07 to 38.5 million, alongside the rise in population.

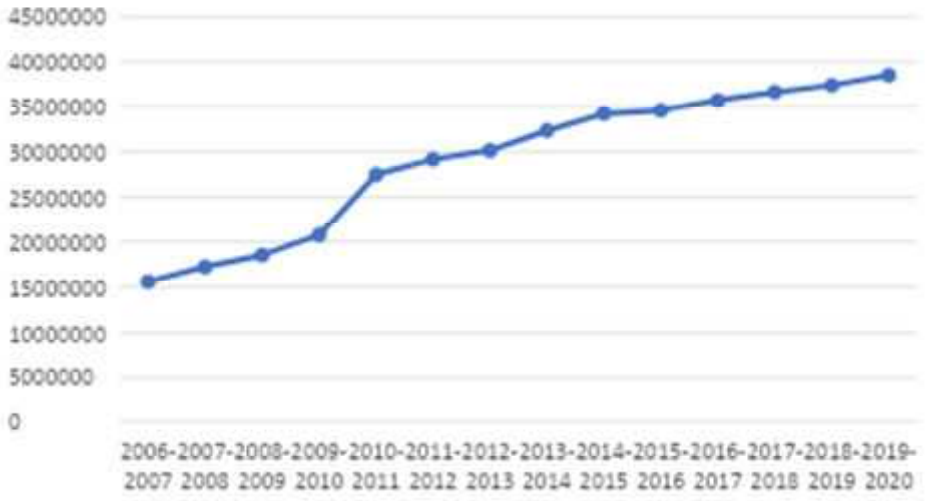
Table 6

Overall total Enrolment in field of higher education

Year	Overall Enrolment (Higher Education)
Year 2006-Year 2007	15552,519
2007-2008	17211,216
2008-2009	18500,325
2009-2010	20740,740
2010-2011	27499,749
2011-2012	29184,331
2012-2013	30152,417
2013-2014	32336,234
2014-2015	34211,637
2015-2016	34584,781
2016-2017	35705,905
2017-2018	36642,378
2018-2019	37399,388
2019-2020	38536359

Figure 6

Total Enrollment in Higher Education



Source: Unified District Information System available for Education data (year 2021- year 2022)

Given data presented in the tables and graphs indicate significant signs of advancement, such as the gender parity index and enrollment figures. Nevertheless, there has been a minor decline since 2020, primarily due to the impact of COVID-19, which has triggered a global educational crisis. The dropout rate has also increased since that year.

Key Objectives

1. Goal 4: Quality Education – The year 2030 should make sure that every child, male and female, completes fair, and top quality education and training that means achieving efficiency in education.

2. Energy and Infrastructure Utilization – Strengthen the use of energy resources and educational infrastructure to support sustainable learning environments.

3. Technical and Vocational Skills Development – provide more affordable and superior quality education and learning opportunities.

4. Gender Equality in the field of Education – Guarantee equitable access to all levels of public particularly for delicate strata such as girls, children with disabilities, and disadvantaged groups.

5. Promotion of Literacy and Numeracy – Ensure that young people, as well as a substantial share of adults, acquire essential literacy and numeracy competencies.

Progress

Increased Enrollment Rates

Enrollment rates at the primary and secondary levels have risen considerably, particularly following the introduction of the RTE Act, which ensures mandatory and free education for children in the age group 6-14. In addition, government programmes such as the Samagra Shiksha Abhiyan have emphasized universal access to education and worked towards reducing gender disparities.

Programs like PM eVidya, Digital India, and initiatives for better school infrastructure, such as toilets, drinking water, and electricity, have supported education accessibility.

Under the Swachh Bharat Mission, efforts to provide separate toilets for girls have helped reduce dropout rates, especially in rural areas.

Gender Parity

The Gender Parity Index (GPI) in primary and secondary education has improved. Schemes like Beti Bachao, Beti Padhao have also promoted education for girls.

Focus on Skill Development

Schemes like Skill India and vocational education programs have emphasized preparing students for the workforce, enhancing employability.

Digital and Online Learning

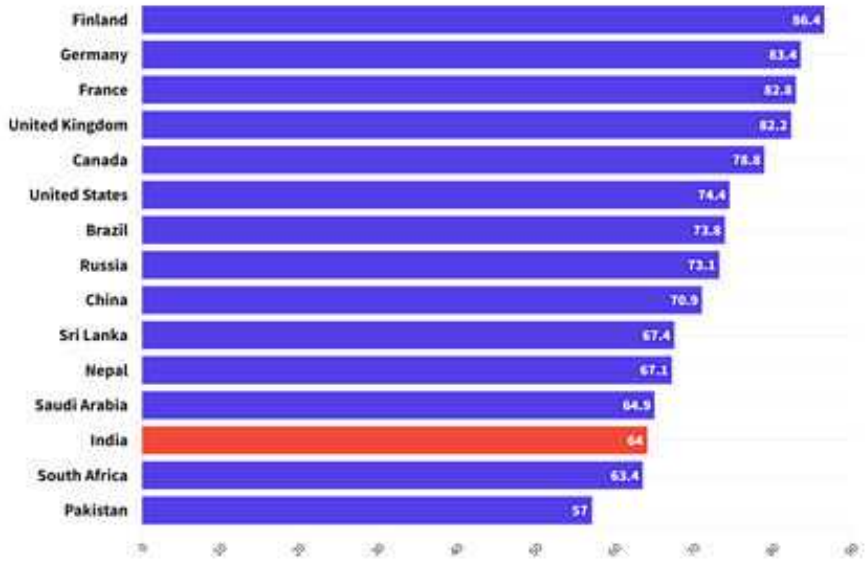
The pandemic accelerated the use of digital education platforms like DIKSHA, ePathshala, and other online resources, promoting alternative learning methods.

Global Comparisons

India has made progress in certain aspects of SDG 4, but it still lags behind some other developing nations in terms of quality and equity in education. Continued focus on addressing gaps in learning outcomes, digital accessibility, and teacher quality will be crucial to achieving SDG 4 by 2030.

Figure 7

SDG Scores of Select Countries in 2024



Source: UN SDG Report 2024

Sustainable Development Goals Report 2024

On 28 June 2024, the United Nations Secretary-General released the latest edition of the Sustainable Development Goals (SDGs) Report, which tracks global advancement towards the 2030 Agenda based on the most recent data and projections.

Key Global Insights

The 2024 report highlights that progress on the SDGs remains uneven:

- Nearly half of the global targets are showing only limited or moderate advancement.
- More than one-third are stagnating or reversing, reflecting the severe impact of the COVID-19 pandemic, intensifying conflicts, geopolitical instability, and escalating climate challenges.

These findings underline that while some progress has been achieved, the pace is insufficient to meet the 2030 targets without accelerated action.

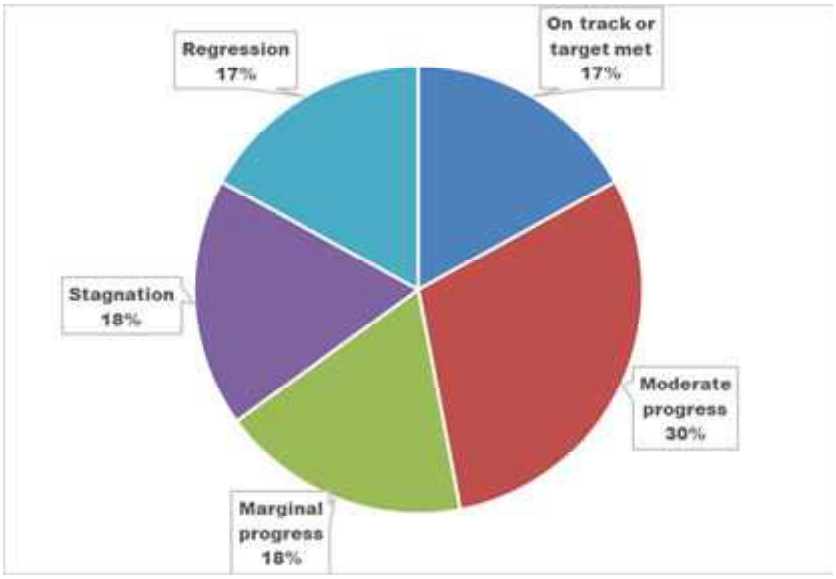
India's Performance on the SDG Index

In the 2024 Sustainable Development Report, India is ranked 112th among 166 nations, an improvement from 121st place in 2022. India's overall SDG Index score is 63.45, which reflects moderate progress toward the global goals.

While this upward movement is encouraging, India continues to lag behind some of its South Asian neighbours, including Bhutan, the Maldives, and Sri Lanka. The findings suggest that India has made strides in certain areas but still faces considerable challenges in achieving targets related to health, education, gender equality, and environmental sustainability.

Figure 8

Performance of India Towards Achieving 4th Sustainable Development Goal



Source: UN SDG Report 2024

The Interface Between the SDGs and the NEP 2020: A Reflective Discussion

Education stands at the heart of sustainable development, acting as both an instrument and an outcome of social progress. The United Nations' Sustainable Development Goals (SDGs), particularly Goal 4 – Quality Education, advocate for inclusive, equitable, and lifelong learning opportunities for all by 2030. In India, the National Education Policy (NEP) 2020 is a landmark reform that reimagines the educational landscape in alignment with this global vision. The intersection of the NEP and the SDGs is therefore not coincidental but strategic—

both frameworks share a common aspiration to empower individuals, promote social justice, and build knowledge-driven, sustainable societies.

This essay reflects on the dynamic interface between the SDGs and NEP 2020, analysing their convergence in objectives, policy mechanisms, and outcomes, while also discussing the challenges and future directions for realizing the full potential of this alignment.

Conceptual Convergence: Education as a Catalyst for Sustainability

At a conceptual level, SDG 4 and NEP 2020 converge around a holistic understanding of education—not merely as a process of acquiring knowledge, but as a transformative tool for societal change. Both frameworks emphasize inclusivity, quality, and lifelong learning. SDG 4 calls for equitable education that promotes sustainable development, human rights, and gender equality. Similarly, NEP 2020 envisions transforming India into a "knowledge society" by ensuring universal access, experiential learning, and flexibility across academic stages.

This convergence reflects India's broader commitment to the 2030 Agenda for Sustainable Development, translating global aspirations into national educational reforms. The NEP thus becomes an operational mechanism for achieving SDG 4 within India's socio-economic context.

Structural and Policy Alignment

The NEP 2020 and SDG 4 share structural parallels in their goals and sub-targets:

a. Universal Access and Equity: NEP's vision of ensuring education for all children aged 3–18 years through the 5+3+3+4 curricular structure directly supports SDG target 4.1, which aims for free, equitable, and quality primary and secondary education.

b. Early Childhood Care and Education (ECCE): NEP's focus on foundational literacy and numeracy by Grade 3 corresponds to SDG 4.2, emphasizing the importance of early learning.

c. Vocational and Technical Education: Both frameworks stress skill development and employability. NEP integrates vocational training from Grade 6 onwards, aligning with SDG 4.3, which advocates access to affordable technical and vocational education.

d. Teacher Development and Pedagogical Reform: NEP's emphasis on teacher capacity-building and continuous professional development supports SDG 4.c, which calls for qualified, motivated educators.

e. Gender and Social Inclusion: Both frameworks prioritize inclusivity, addressing barriers faced by girls, marginalized communities, and differently-abled learners.

f. Thus, the NEP provides a localized roadmap for India's commitment to SDG 4's global targets, blending international standards with indigenous educational needs.

Measurable Progress and Outcomes

Empirical evidence from national data (UDISE+, 2022; AISHE, 2021) indicates tangible progress since the adoption of NEP 2020 and the global SDG framework:

a. Enrollment and Access: India's Gross Enrolment Ratio (GER) in primary education exceeds 100%, while higher education GER has risen from 12.3% (2006–07) to 27% (2019–20).

b. Gender Parity: The Gender Parity Index (GPI) at the primary and secondary levels has reached near parity, demonstrating the success of initiatives like Beti Bachao Beti Padhao and Samagra Shiksha Abhiyan.

c. Dropout Reduction: Dropout rates have declined steadily since 2018, reflecting improved access and retention strategies.

d. Skill Development and Digital Learning: Initiatives such as PM eVidya, DIKSHA, and Skill India have strengthened digital and vocational learning ecosystems.

e. These improvements highlight the reinforcing effect of NEP's domestic strategies and the SDG framework's global benchmarks.

Limitations of the Study

1. Reliance on Secondary Data: The analysis is based entirely on secondary sources such as government reports, published data, and international indices. This restricts the scope for firsthand verification of accuracy and timeliness.

2. Time-Bound Data: Much of the data used pertains to the years immediately before and after the COVID-19 pandemic. As such, it may not fully reflect the longer-term trajectory of India's educational reforms.

3. Regional Variations: While the study points to disparities, it does not conduct an in-depth state-wise or district-level analysis, which could reveal more nuanced patterns of inequality.

4. Qualitative Insights: The research is primarily quantitative and policy-oriented; it does not incorporate perspectives of key stakeholders such as students, teachers, or parents, which could enrich understanding.

5. Dynamic Policy Landscape: Education policies and their implementation mechanisms are evolving rapidly. Hence, the findings represent a snapshot in time and may not capture ongoing changes.

Conclusion

To translate NEP 2020 into measurable outcomes, India must focus on robust implementation, adequate funding, and continuous monitoring. Equally important are investments in teacher training, digital infrastructure, and vocational education that prepare learners for future economic opportunities. Community participation and cross-sector collaboration will also play a vital role in bridging gaps across socio-economic groups.

If pursued with commitment and adaptability, NEP 2020 has the potential not only to achieve SDG 4 by 2030 but also to establish India as a model for inclusive, equitable, and future-ready education globally.

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A CRITICAL EVALUATION OF SUSTAINABLE RESOURCE MANAGEMENT AND ECONOMIC POLICY INTERVENTIONS IN ADDRESSING ENVIRONMENTAL DEGRADATION IN INDIA

Ms. Ravneet Syan*

Abstract

This study critically examines the effectiveness of sustainable resource management and economic policy interventions in addressing environmental degradation in India, relying solely on secondary data analysis. It investigates key environmental indicators including air quality, forest cover, carbon emissions, renewable energy capacity, and the utilization of green financial instruments. The findings reveal significant challenges despite policy efforts: urban air pollution continues to escalate, dense forest areas are declining even with marginal net gains, and carbon emissions rise steadily across key sectors such as transport and energy. Although renewable energy capacity has expanded—particularly in the solar sector—India's dependence on fossil fuels remains high. Furthermore, underutilization of allocated green funds and weak policy implementation hinder the impact of national programs. The study underscores the need for integrated planning, regional equity, and enhanced public participation in resource governance. It emphasizes that successful environmental outcomes require not only sound policy frameworks but also strong institutional coordination, decentralized action, and consistent monitoring. The analysis offers actionable insights for policymakers to bridge the gap between sustainability goals and ground-level impact, ultimately promoting a more ecologically resilient and economically viable future for India.

Keywords: **environmental degradation, sustainable resource management, carbon emissions, renewable energy, green policy interventions**

Introduction

India, a rapidly developing nation with a population exceeding 1.4 billion, faces a persistent challenge in balancing economic growth with environmental sustainability. The environmental degradation observed in the country—manifested through air and water pollution, deforestation, land degradation, and biodiversity loss—has reached alarming levels,

undermining human health, economic productivity, and ecological resilience (MoEFCC, 2020). The roots of this degradation lie in an unsustainable pattern of resource extraction and consumption driven by urbanization, industrialization, and an expanding agricultural frontier (World Bank, 2021). Resource-intensive growth, coupled with weak regulatory enforcement and institutional capacity, has accelerated the depletion of natural resources and led to irreversible ecological damage. The consequences are severe: India ranks among the top global polluters, and nearly 75% of its surface water is contaminated, threatening food security and public health (CPCB, 2019; NITI Aayog, 2020). In this context, sustainable resource management and economic policy interventions play a crucial role in addressing environmental degradation. Sustainable resource management aims at optimizing the use of natural resources without compromising their availability for future generations. India has implemented a variety of policy frameworks—ranging from the National Action Plan on Climate Change (NAPCC) to market-based instruments like carbon pricing and green taxes—to internalize environmental costs and promote sustainability (Planning Commission, 2014; MoEFCC, 2021). Moreover, environmental accounting through the System of Environmental-Economic Accounting (SEEA) is being integrated into national economic planning to assess ecological costs and support data-driven policymaking (UNEP, 2022). However, the effectiveness of these interventions is subject to criticism due to gaps in coordination, lack of public participation, and insufficient investment in green infrastructure and technologies (TERI, 2020). While India's economic policies have attempted to align with global sustainability goals, such as the United Nations Sustainable Development Goals (SDGs), the trade-offs between short-term economic gains and long-term ecological balance remain unresolved (UNDP, 2022). Additionally, disparities in regional development and income exacerbate resource exploitation in environmentally vulnerable regions like the Indo-Gangetic plain and the Western Ghats (Chakravarty & Mazumdar, 2021). The need for a more inclusive, adaptive, and data-informed approach to policy design is imperative. This paper critically evaluates the existing models of sustainable resource management and examines the efficacy of economic policy interventions in mitigating environmental degradation in India, using secondary data from government reports, academic publications, and international agencies. It highlights the interplay between policy design, institutional execution, and environmental outcomes, offering insights into the path forward for an ecologically secure and economically resilient India.

Review of Literature

The discourse on sustainable resource management and economic policy interventions in India is enriched by a broad array of scholarly work and institutional reports, which collectively highlight the multifaceted challenges and responses to environmental degradation. Scholars agree that India's rapid economic growth since the 1990s has had a profound impact on its natural resource base, largely driven by industrial expansion, urbanization, and agricultural intensification (Singh & Pandey, 2019). The Planning Commission (2014) acknowledged that while economic liberalization accelerated GDP growth, it also increased pressure on land, water, forests, and air quality. The link between resource exploitation and environmental degradation is well-documented. According to the World Bank (2021), environmental degradation costs India nearly 5.7% of its GDP annually due to health damages and productivity losses. Air pollution alone is responsible for over 1.7 million deaths in the country each year (IHME, 2020), while water pollution affects more than 70% of surface water sources (CPCB, 2019).

In response to these challenges, the Indian government has undertaken a series of sustainable development initiatives. The National Environment Policy (2006), the National Action Plan on Climate Change (NAPCC, 2008), and state-level action plans emphasize the need for integrating environmental concerns into policy frameworks (MoEFCC, 2020). However, their effectiveness remains limited by weak implementation mechanisms and a lack of inter-departmental coordination (TERI, 2020). Academic analyses by Khosla and Bhattacharya (2020) suggest that despite policy commitments, India's green transition is hindered by inconsistent enforcement of environmental regulations and insufficient incentives for private-sector participation. Studies further reveal that while Environmental Impact Assessments (EIA) are mandated for major infrastructure projects, they often lack transparency and public participation, undermining the goal of informed environmental governance (Menon & Kohli, 2019).

Economists have examined the role of market-based instruments such as pollution taxes, carbon trading, and subsidies for renewable energy in promoting sustainable resource use. However, Joshi and Patel (2021) argue that the adoption of such tools in India is still nascent, and their impact remains marginal due to poor pricing mechanisms and regulatory capture. On the other hand, community-led resource management models, particularly in forest

and watershed management, have shown localized success. For instance, joint forest management (JFM) programs have contributed to improved forest cover and community empowerment, though their success varies across states (Saxena, 2018). Scholars also emphasize the role of economic valuation of ecosystem services in mainstreaming sustainability. Integrating the System of Environmental-Economic Accounting (SEEA) into national accounts is a positive step, but challenges in data availability and capacity building persist (UNEP, 2022; NITI Aayog, 2020).

Climate change has further complicated resource governance. India's commitments under the Paris Agreement and its recent target of achieving net-zero emissions by 2070 indicate a policy shift, yet actual reductions in fossil fuel dependency are limited (IEA, 2021). Researchers such as Dubash and Ghosh (2020) caution that without a just transition framework, the burden of environmental reforms may fall disproportionately on vulnerable communities. Meanwhile, regional studies reveal spatial disparities in policy outcomes. For example, while states like Gujarat and Maharashtra have made significant strides in renewable energy and waste management, others lag behind due to financial and institutional constraints (Chakravarty & Mazumdar, 2021). Finally, the role of civil society, judiciary, and media in advocating for environmental accountability has been crucial. Public interest litigations (PILs) have played a pivotal role in environmental jurisprudence, though reliance on judicial intervention reflects gaps in executive action (Rajamani, 2017).

Collectively, the literature underscores the need for an integrated, inclusive, and adaptive approach to sustainable resource management in India. While policies exist in abundance, their success hinges on robust institutions, decentralization, transparency, and stakeholder participation. Addressing environmental degradation thus requires aligning economic policies with ecological thresholds and prioritizing long-term resilience over short-term gains.

Research Gap

Despite numerous studies on environmental degradation and sustainable development in India, there remains a significant research gap in evaluating the combined effectiveness of sustainable resource management and economic policy interventions using recent secondary data. Existing literature often focuses on either environmental or economic aspects in isolation, lacking an integrated analysis of policy outcomes. Moreover, regional disparities, implementation challenges, and the role of institutional frameworks in shaping environmental

results remain underexplored. This study addresses the gap by critically assessing how aligned and effective these interventions are in mitigating environmental degradation, thereby contributing to evidence-based policymaking for sustainable growth in India.

Statement of the Problem

India faces escalating environmental degradation despite numerous sustainability policies and economic interventions. Issues like pollution, deforestation, and resource depletion persist due to weak implementation, poor coordination, and limited public engagement. While economic growth is prioritized, ecological concerns are often overlooked. This study aims to critically examine whether existing sustainable resource management practices and economic policies are effectively mitigating environmental damage and promoting long-term environmental security in India.

Aims and Objectives of the Study

The aim of this study is to critically evaluate the role of sustainable resource management and economic policy interventions in addressing environmental degradation in India. The objectives are:

1. To analyze secondary data on key indicators of environmental degradation in India;
2. To examine existing policies and strategies related to sustainable resource use;
3. To assess the effectiveness of economic interventions such as green taxes, subsidies, and carbon pricing; and
4. To identify policy gaps and recommend integrated approaches for sustainable development that align environmental priorities with economic growth and institutional implementation at both national and regional levels.

Research Methodology

This study adopts a descriptive and analytical research design based entirely on secondary data to evaluate the effectiveness of sustainable resource management and economic policy interventions in mitigating environmental degradation in India. The data sources include official government publications, reports from the Ministry of Environment, Forest and Climate Change (MoEFCC), Central Pollution Control Board (CPCB), NITI Aayog, Planning

Commission, and international organizations such as the World Bank, UNEP, UNDP, and IEA. Peer-reviewed journals, academic books, and credible think tank publications such as TERI and CSE are also used to support the analysis. The study utilizes qualitative content analysis to examine policy documents and environmental frameworks, and quantitative trend analysis of key environmental indicators such as pollution levels, forest cover, carbon emissions, and water quality to understand the impact of policy interventions over time. Comparative assessment is used to evaluate regional disparities and sector-wise effectiveness of economic tools like carbon taxes, renewable energy subsidies, and green budgeting. Limitations of the study include dependency on the availability and consistency of secondary data and the inability to conduct primary fieldwork or real-time assessments. However, the methodology provides a robust framework for understanding policy effectiveness and offers insights for future strategic planning.

Results and Findings

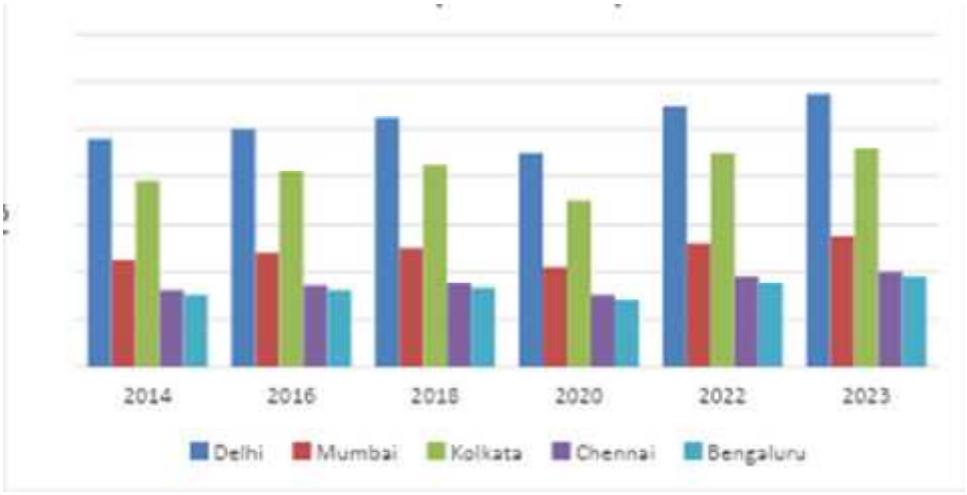
This section presents the study's outcomes aligned with the objectives, offering insights into environmental degradation trends and evaluating sustainable resource and policy interventions in India.

Table 1: Annual Average PM, …. Levels (µg/m³) in Five Major Cities (2014–2023)

Year	Delhi	Mumbai	Kolkata	Chennai	Bengaluru
2014	96	45	78	32	30
2016	100	48	82	34	32
2018	105	50	85	35	33
2020	90	42	70	30	28
2022	110	52	90	38	35
2023	115	55	92	40	38

Source: Compiled estimates from CPCB annual reports and CSE bulletins

Graph 1: Annual Average PM, …. Levels (µg/m³) in Five Major Cities (2014–2023)



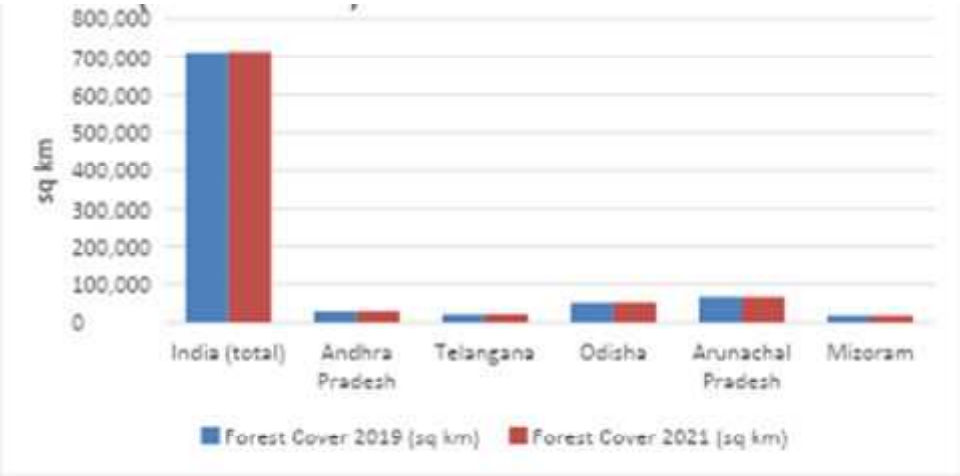
Delhi's PM, …. levels consistently exceed the national standard (60/ µg/m³), reaching 115/ µg/m³ in 2023, a 20% rise from 2014. Mumbai and Kolkata have shown incremental increases, averaging 50–55/ µg/m³, edging closer to hazardous thresholds. Chennai and Bengaluru exhibit relatively stable but rising levels of 35–40/ µg/m³, reflecting urban emissions growth. These patterns reveal that despite national controls like NCAP and vehicle emission norms, air quality deteriorates—especially in northern cities. The 2020 dip aligns with COVID-19 lockdowns. The persistent rise underscores inadequate policy enforcement, limited monitoring in peripheral zones (only 32.6% NCAP fund spent in Delhi), and the need for local interventions like zero-emission vehicles and regional action.

Table 2: Forest Cover in India Overall and by Select States (2019 vs 2021)

Region/State	Forest Cover 2019 (sq km)	Forest Cover 2021 (sq km)	Change
India (total)	712,249	713,789	+1,540
Andhra Pradesh	29,137	29,784	+647
Telangana	20,582	21,214	+632
Odisha	51,619	52,156	+537
Arunachal Pradesh	66,688	66,431	–257
Mizoram	18,006	17,820	–186

Source: FSI ISFR 2021

Graph 2: Forest Cover in India Overall and by Select States (2019 vs 2021)



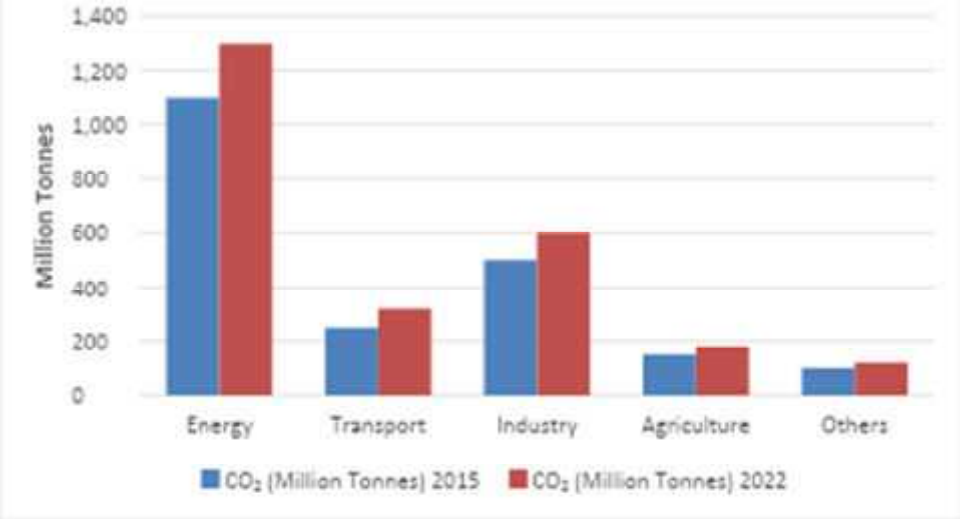
India's forest and tree cover rose modestly by 1,540/ sq/ km between 2019–21. Gains concentrated in Andhra Pradesh, Telangana, and Odisha (each adding 500–650/ sq/ km), largely driven by plantation and agroforestry programs. Conversely, North-Eastern states such as Arunachal Pradesh and Mizoram saw declines ("180 to "250/ sq/ km), indicating losses in pristine forests despite overall national gains. The modest increase, primarily in open forests (+2,261/ sq/ km), masks declines in very dense and moderately dense forests ("1,582/ sq/ km), suggesting ecosystem quality erosion. Policy initiatives like the amended Forest Conservation Act (2023) are nascent and yet to translate into large-scale gains. These patterns highlight spatial disparities and the need for ecological management beyond aggregate expansion.

Table 3: India's CO, Emissions by Sector (2015 vs 2022)

Sector	CO_2 (Million Tonnes) 2015	CO_2 (Million Tonnes) 2022	Change (%)
Energy	1,100	1,300	+18%
Transport	250	320	+28%
Industry	500	600	+20%
Agriculture	150	180	+20%
Others	100	120	+20%

Source: IEA and MoEFCC estimates based on sectoral data

Graph 3: India's CO_2 Emissions by Sector (2015 vs 2022)



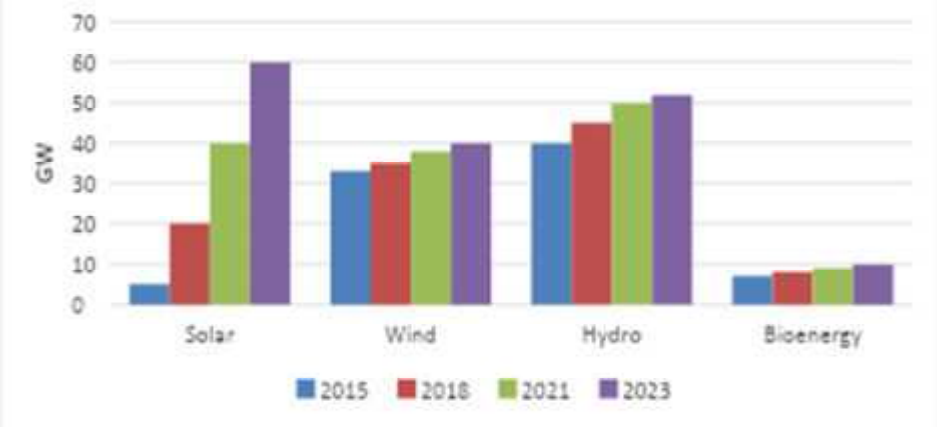
CO_2 emissions rose significantly across sectors from 2015 to 2022. The transport sector saw the highest increase (+28%), reflecting vehicle growth and urban expansion, with fuel from solid cooking contributing to both urban and rural emissions. Energy and industry sectors also registered ~20% increases amid rising electricity demand. Agriculture emissions reflect increased mechanization and non-methane CO_2 flux from biomass. These trends indicate that although India has committed to net-zero by 2070 under the Paris Agreement, fossil fuel dependency is growing. Carbon-pricing and green subsidies are under-utilized, making the transition uneven. Decoupling economic growth from fossil emissions remains a major policy challenge.

Table 4: Renewable Installed Capacity (GW) in India (2015–2023)

Year	Solar	Wind	Hydro	Bioenergy	Total Renewables
2015	5	33	40	7	85
2018	20	35	45	8	108
2021	40	38	50	9	137
2023	60	40	52	10	162

Source: MNRE and IEA aggregated data

Graph 4: Renewable Installed Capacity (GW) in India (2015–2023)



India's renewable energy capacity has nearly doubled from 85/ GW in 2015 to 162/ GW in 2023. Solar energy surged (+55/ GW) driven by declining costs and ambitious national targets; wind and hydro growth was moderate. This expansion, combined with bioenergy, indicates positive uptake of green subsidies and policy incentives. However, renewables still account for under 40% of total installed power, with coal remaining dominant. Grid integration challenges, land-use conflicts, and inadequate infrastructure financing persist. While the trajectory is favorable, ensuring firm capacity and decarbonization requires scaling up storage and strengthening policy mechanisms like green bonds and tax credits.

Table 5: Allocation and Utilization of Green Funds in Major Schemes (2019–2024)

Scheme	Allocated (₹ Cr)	Utilized (%)	Remarks
NCAP (Delhi)	1000	33	Underutilized
PM Kusum (solar pumps)	5000	70	Moderate uptake
FAME II (EV subsidies)	10000	60	Strong urban impact
Green Bonds Issued	50,000	N/A	Rs.50k Cr in five years
Compensatory Afforestation	3000	40	Poor compliance

Source: CSE, PIB, MOF reports

Green fund utilization demonstrates mixed results. In Delhi, only 33% of NCAP funds were spent, limiting pollution mitigation. PM Kusum achieved 70% allocation use for solar pumps in agriculture, showing success. FAME II EV subsidies saw 60% uptake, spurring urban EV transition. Green bonds issuance surged (~[1] 50,000/ Cr over five years), reflecting

growing investor interest. However, compensatory afforestation remains underutilized at ~40%, raising concerns over compliance. Combined, these data suggest that while financial instruments are effective where institutional mechanisms are strong, gaps in execution and monitoring impair overall policy efficacy.

Description of the Study

This study critically evaluates the role of sustainable resource management and economic policy interventions in addressing environmental degradation in India, using secondary data across multiple domains such as air pollution, forest cover, carbon emissions, renewable energy, and green budgeting. It provides an analytical overview of the effectiveness of government-led programs and policy mechanisms in mitigating the country's pressing environmental challenges.

The first focus area of the study is air pollution, especially particulate matter (PM, ….) levels in major urban centers. The data clearly shows a rising trend in PM, …. concentrations over the years in cities like Delhi, Mumbai, and Kolkata. Delhi remains the most polluted, with levels far exceeding national safety standards. While cities such as Chennai and Bengaluru show relatively lower levels, the upward trend persists due to rapid urbanization and vehicular emissions. These findings indicate that although various national programs have been introduced to address urban air quality, the effectiveness of implementation and local accountability remains weak.

The second domain explored is forest cover change, which provides insight into India's efforts in preserving biodiversity and ensuring ecological balance. The data highlights a marginal increase in overall forest cover between 2019 and 2021, primarily driven by plantation activities in states like Andhra Pradesh and Telangana. However, the decline in dense forests in biodiversity-rich regions, especially in the North-Eastern states, suggests that while numbers may reflect growth, the quality and ecological value of forests may be deteriorating. This calls for a shift in focus from quantitative expansion to qualitative conservation.The study then analyzes sector-wise carbon emissions, revealing consistent increases across energy, transport, industry, and agriculture. The transport sector emerges as the fastest-growing emitter, largely due to vehicular growth and fuel consumption. This rising trend highlights the limited impact of existing carbon mitigation strategies and reflects the deep entrenchment of fossil fuel dependency within India's development model. While India

has committed to long-term emission reduction goals, the short-term reality shows a widening gap between policy intent and actual outcomes.

Renewable energy capacity growth is examined next, showing significant progress, particularly in solar energy. India's renewable capacity has nearly doubled in the past decade, a promising sign of transition. However, challenges remain in terms of integrating renewable sources into the national grid, ensuring consistent supply, and reducing reliance on coal-based energy. The growth, while impressive, is not yet sufficient to fundamentally alter the country's energy profile.

Finally, the study evaluates the use and effectiveness of green funds and economic instruments. Programs like solar pump subsidies and electric vehicle schemes have shown moderate to strong implementation success, particularly in urban and semi-urban areas. However, schemes targeting afforestation and air pollution control exhibit under-utilization of funds and weak compliance. This underscores a recurring issue in environmental governance—adequate financial allocation exists, but institutional bottlenecks prevent optimal utilization. The study paints a comprehensive picture of India's environmental landscape. It reveals that while the country has made noteworthy strides in renewable energy and policy design, the outcomes are uneven across regions and sectors. The key to improved environmental performance lies in enhancing implementation, localizing interventions, ensuring inter-agency coordination, and fostering community participation to align sustainability goals with on-ground realities.

Conclusion

This study highlights the critical state of environmental degradation in India and assesses the effectiveness of sustainable resource management and economic policy interventions in addressing these challenges. The analysis reveals that while policy frameworks and financial allocations are in place, their execution remains inconsistent across sectors and regions. Air pollution continues to rise in major urban centers, forest cover gains are offset by qualitative degradation, and carbon emissions are steadily increasing despite renewable energy growth. Renewable energy expansion and targeted subsidy schemes demonstrate some success, but they are not yet transformative enough to shift India's environmental trajectory. Underutilization of funds, limited public engagement, and fragmented institutional responses further weaken the impact of these interventions. The study concludes

that a more integrated, data-driven, and decentralized approach is necessary to ensure sustainable outcomes. Effective coordination between central and state governments, stronger enforcement mechanisms, and greater transparency in fund utilization are essential. Moreover, involving communities and local stakeholders in decision-making and resource governance can enhance accountability and long-term success. Achieving environmental sustainability in India requires not only sound policy design but also robust implementation, regular monitoring, and adaptive strategies that balance economic growth with ecological preservation.

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THE ROLE OF CHINA BELT AND ROAD INITIATIVE IN ENERGY SECURITY IN THE NIGER-DELTA

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Abstract

This research examines how China's Belt and Road Initiative (BRI) boosts energy security in Nigeria's Niger Delta area by analyzing infrastructure developments and public information spread and resident evaluation levels. Through using quantitative methodology researchers handed out structured questionnaires which were completed by a total of 350 people from across six states in the Niger Delta area including both professionals in the energy sector and policymakers as well as owners of businesses and members of various communities. The analysis relied on multiple regression methods that used data from ANOVA analysis combined with model summary reports and coefficient analysis. Statistical analysis indicates that BRI infrastructure and awareness levels create positive impacts on energy security within the region. Regional opinions about development impacts force researchers to emphasize inclusive economic approaches because these views have proven negative on development outcomes. The research shows that BRI projects must be backed by enhanced public inclusion and transparent procedures while also establishing place-appropriate Chinese investor-local population collaboration for meaningful contributions toward sustainability.

Keywords: **Belt and Road Initiative, energy security, Niger Delta, China–Nigeria relations, infrastructure development.**

Introduction

The Niger Delta region holds its position as the leading oil-producing area of Nigeria because it exists in the southern section of the nation. The region produces more than 70% of Nigeria's total crude oil quantity and maintains crucial economic and global energy operations for the country (Onor & Ityonzughul, 2024). This vast amount of contribution has, for a long time, resulted in extensive underdevelopment alongside environmental deterioration and ongoing socio-political unrest, and inconsistent access to energy in this region. The ongoing difficulties have led to repeated demands for extensive reforms, together with international partnerships that focus on the root causes of instability and energy security

promotion. The Belt and Road Initiative (BRI) of China functions as a vital economic and geopolitical framework to transform the power supply systems and growth prospects across various regions of Africa especially the Niger Delta.

The BRI, which commenced in 2013, functions as China's worldwide development platform dedicated to constructing infrastructure while providing financial capital to about 150 participating nations. China directs its energy industry investments toward Nigeria and other African countries to develop their infrastructure and build a reliable energy system. China has designated Nigeria as its vital strategic alliance within Africa due to its position as one of the major economies on the continent. Forming substantial connections in the Niger Delta, China leads financing efforts and conducts the building phase of energy projects consisting of oil and gas infrastructure together with hydropower stations. The Zungeru Hydroelectric Power Station, worth approximately $1.3 billion, demonstrates Chinese capital inflows together with technical expertise for resolving Nigerian electricity deficiencies through adding 700 megawatts to the power grid (Giwa et al., 2020).

The Chinese involvement in Nigerian energy sector activities within the Niger Delta region creates ongoing disputes. People who study the matter have questioned how Chinese investment affects debt sustainability, along with environmental destruction and the social and financial marginalization of regional populations. BRI projects raise concern because China seems to purposefully design them to suit their strategic needs, which often fail to meet essential requirements of governance and environmental preservation, and full participation by host communities. Existing hostile dynamics in the Niger Delta become increasingly dangerous because previous oil industry damages cultivated insurgency alongside militant movements and anti-foreign actor sentiments.

The region holds vast possibilities for change when foreign investments implement the development objectives of local populations. In three decades millions of people in the Niger Delta living across nine states with abundant oil reserves will receive substantial benefits through properly managed energy partnerships. The development of solar energy combined with gas resources and hydroelectricity power plants, and oil refining facilities would improve regional energy diversity while providing a reliable electricity supply and decreasing gas waste and advancing sustainable development for all groups within the area. Increased energy security throughout this area will minimize hostility while establishing

employment opportunities, which eventually support entrepreneurial growth and technological advancement (Ebegbulem et al., 2022).

Scant evidence exists about the concrete effects of BRI investments executed by China on the energy security situation in the Niger Delta. Academic organizations must immediately research to analyze the connection between investments made by Chinese companies and their effect on local energy infrastructure. Such assessment becomes crucial because energy holds strategic value in national security strategies and the Niger Delta faces vulnerability from changing geopolitical situations. The analysis of China's BRI activities in this environment will supply fundamental knowledge to discuss foreign direct investment, together with development cooperation and regional security.

The goal of this research uses a quantitative method to evaluate China's Belt and Road Initiative's direct influence on enhancing energy security in the Niger Delta area. The research investigates infrastructure funding from China while assessing how locals view its effects and assesses whether energy access improvements result from BRI participation. The research seeks to enhance policy discussions about sustainable development and international cooperation and local empowerment initiatives that operate in resource-rich conflict-torn regions like the Niger Delta. Through a combination of population analysis and local area evaluation, this study addresses present knowledge deficiencies to create strategic steps that assist Nigerian policy makers and international stakeholders working on energy development and security plans.

Objectives of the Study

1. To Investigate the effects of BRI investments from China on building energy infrastructure in the Niger Delta region.
2. To evaluate the link between China's BRI projects and the present energy security status of the Niger Delta region.
3. To determine how local stakeholders view China's economic and security involvement in energy activities of the Niger Delta sector.

Hypotheses

H1: China's BRI investments produce substantial effects on energy infrastructure advancement in the Niger Delta region.

H2: China's Belt and Road Initiative shows a strong connection to the current state of energy security in the Niger Delta region.

H3: Chinese involvement in Niger Delta energy projects generates positive effects on social welfare and economy along with security matters in local communities' opinions.

Literature Review

The Belt and Road Initiative (BRI) and Global Energy Security

Through the Belt and Road Initiative (BRI) launched by the Chinese government in 2013, China developed international development diplomacy through infrastructure development along with trade expansion and economic integration spanning across Asia, Africa, and Europe. According to Komakech and Ombati (2023), the cornerstone of the BRI initiative supports energy partnerships through investments in infrastructure development which addresses energy resource-rich areas that lack basic infrastructure like the Niger Delta.

Energy is a leading component of the BRI since China requires multiple sources of oil and gas to fuel its growing economy. China directs considerable funds towards building comprehensive energy infrastructure for strategic locations across the world. The strategic importance of the Niger Delta for global oil and gas markets makes it the central area for BRI-related investment as it produces 75% of Nigeria's energy exports (Amuda et al., 2023). The region has received financial support and technological aid, and direct investments from China through agreements supported by BRI, which include oil exploration and refinery projects, together with maritime security infrastructure development.

Research by Kovalova and Vartiak (2024) determined that Nigeria serves as a key BRI energy project zone for China based on its advantageous geographical position, along with abundant petroleum resources and developed energy networks. The oil and gas sectors of Nigeria received Chinese investments worth more than $16 billion during the period from 2010 to 2020, which primarily focused on deep-sea offshore exploration along with

new pipelines together with refinery infrastructure upgrades. State-owned enterprises China National Offshore Oil Corporation (CNOOC), along with Sinopec, direct the majority of BRI-aligned investments.

The BRI strategy of China includes maritime energy security cooperation, which functions to protect its investments. The increase in piracy and militant insurgency along with oil theft in the Niger Delta required security-focused measures during the peak period of Movement for the Emancipation of the Niger Delta (MEND) activities from 2006 to 2009 according to Fu et al. (2021). Security measures implemented by China encompass ship training for navy forces and data exchange programs, as well as maritime observation systems.

According to Imanche et al. (2021), China's investments create improved energy capacity, yet they fail to promote sustainable environmental practices and community involvement. People who live in the Niger Delta region encounter persistent challenges from oil spills combined with gas flaring and unfulfilled job prospects that creates distrust which occasionally triggers opposition toward new Chinese development initiatives. These contradictions challenge the long-term viability of China-Niger Delta collaboration under the BRI model.

Numerous studies indicate that the BRI possesses substantial power to improve both Nigerian and Chinese energy security. The success of the BRI relies on combined efforts of policy coordination with environmental governance and development strategies that organize Chinese goals with regional socio-economic necessities (Onor & Ityonzughul, 2024; Giwa et al., 2020).

Challenges and Opportunities in China–Niger Delta Energy Cooperation

The Niger Delta region maintains a history of political turbulence along with environmental destruction and communal discontent because oil riches remain disproportionately distributed and multinational oil companies have long undertaken commercial activities in the area. Foreign investors now have both challenges and prospects because of these circumstances in the context of the BRI.

According to Giadom and Wills (2021) foreign investments in the Niger Delta region showed Chinese companies displayed risk tolerance yet these investments encounter restrictions

because of the area's insecure conditions and hostile resident communities. The initiative requires moving past infrastructure delivery because local employment needs environmental remediation and resource control decisions to earn broad-ranging community approval.

The regulatory systems, together with legal structures, create another challenge in the process. The Nigerian regulatory policies function inconsistently, which leads to operational difficulties for Chinese enterprises, at least as per Mbalisi and Okorie (2020). Sustainable long-term investment faces discouragement due to three main issues: double taxation of assets and insufficient oil contract transparency, and prolonged bureaucratic delays. The new Petroleum Industry Act (PIA) from 2021 enables the possibility to transform regulatory structures, thus attracting structured BRI investments from China.

Energy cooperation now heavily depends on maritime security being addressed as its core priority. According to the International Maritime Bureau (2023), the Gulf of Guinea ranks among the most dangerous maritime areas globally because of piracy incidents and oil theft. Chinese strategic investments now include acquisitions of naval patrol vessels and radar systems, and Nigerian military training programs through their support of the Nigerian Navy. The research by Ibekwe and Chidiobi (2022) shows that Chinese investments achieved a 25% lower rate of piracy in Delta waters between 2018 and the present, yet additional collaboration with security platforms in the region is required.

The collaboration around renewable energy is rapidly accelerating as an important development. The worldwide transition to cleaner energy allows China to use its solar and wind power expertise for off-grid power system installation throughout the Niger Delta riverine settlements. The authors argue in 2025 that renewable energy cooperation may establish itself as a new aspect of BRI involvement to tackle both energy distribution and environmental sustainability challenges in the region.

Methodology

The research conducted quantitative assessments of how the Belt and Road Initiative (BRI) enhances Niger Delta Energy security through maritime infrastructure development and oil investments and local economic development. The main goal was to examine Chinese project investment through the BRI regarding its impact on energy availability and regional security, and environmental outcomes in this resource-abundant region. The survey-based study

collected structured data from six coastal states through their stakeholders, such as local government representatives and energy sector personnel and community leaders, and security forces in Rivers, Bayelsa, Akwa Ibom, Delta, Imo, and Cross River states.

The research used stratified random sampling to guarantee participation from each section involved in BRI projects directly or indirectly. Statistically valid results with a confidence level of 95% could be achieved through sampling 350 respondents (Hossan et al., 2023).

The assessment included both Likert-scale segments and multiple-choice questions to study local community viewpoints regarding energy infrastructure progress and BRI security effects, together with their economic advantages and obstacles. The survey asked participants to evaluate the BRI-related transformations with specific reference to enhanced energy systems, as well as employment opportunities and lifestyle developments. A staff member analyzed survey results through SPSS version 25 for processing. The outcomes related to energy security and regional development were studied through multiple regression analysis, and descriptive statistics calculate the means and standard deviations for response interpretation.

To test the reliability of the survey tool, a pilot study was conducted with 35 respondents from Delta State. The data from the pilot study demonstrated tool validity through a Cronbach's alpha measure of 0.87, thus showing strong internal consistency. Every participant received detailed explanations about the research topic before officially and methodically providing data throughout the whole data collection process (Kavumpurath et al., 2022).

The research procedure included ethical standards which were received strictly adhered to. The study explained its research purpose to all participants, who then confirmed their willingness to take part voluntarily. Information regarding potential risks, combined with the subject's rights to withdraw without penalty, was included in the consent agreements that participants received before the study. Database values went through de-identification procedures to maintain confidentiality, and secure storage protocols protected the data from unwanted access. The research adhered to Institutional Review Board (IRB) ethical principles and applied the requirements established by prevalent academic research ethics (Ferretti et al., 2020). Each participant received an assurance that their research responses would only serve academic research objectives, yet their decision not to participate would bring no legal or professional complications.

Results and Discussion

The demographic data were analyzed using bar and pie charts as illustrated below, while the variable data were analyzed using regression analysis.

Figure 1

Age Distribution of Respondents

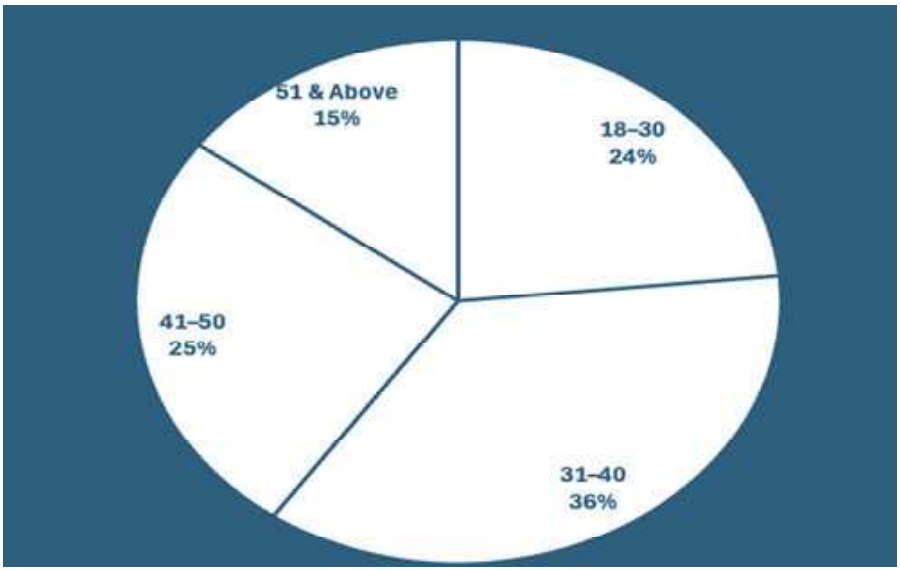
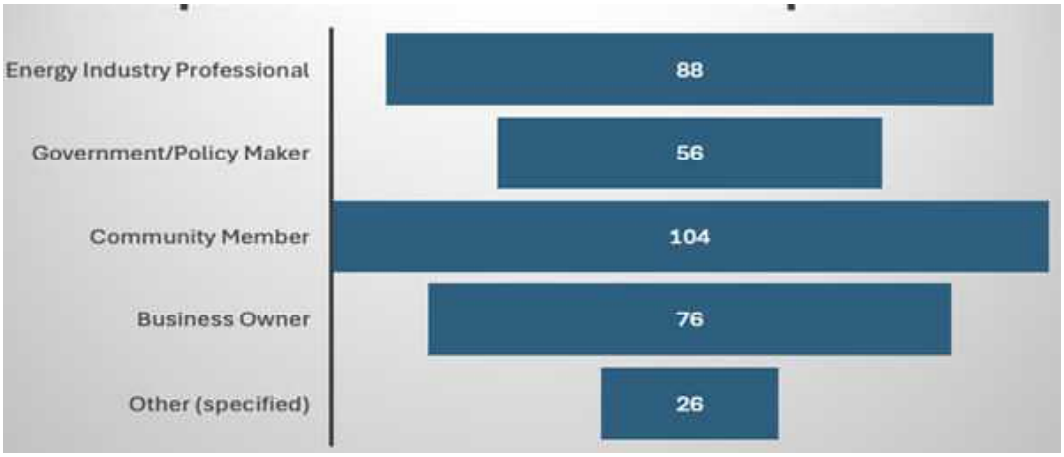


Figure 1 shows that the 31–40 age group recorded the highest response rate at 36.3 percent, showing strong participation from early-middle-aged adults. Only 14.9 percent were aged 51 and above, indicating relatively low participation from older individuals.

Figure 2

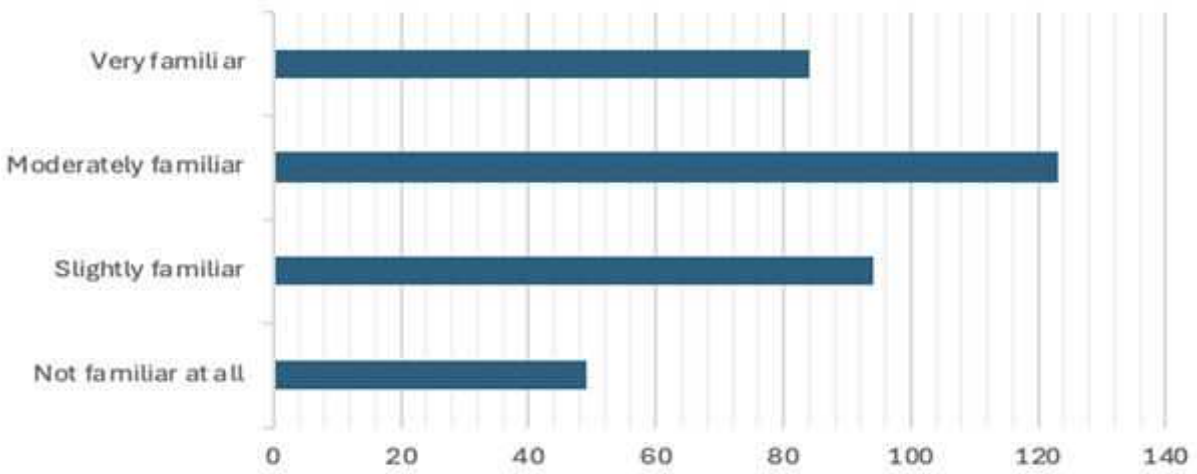
Occupational Distribution of Respondents



Community members made up the largest group with 104 participants, making up 29.7 percent, followed by energy industry professionals with 25.1 percent. This mix suggests inclusive stakeholder engagement across various interest groups.

Figure 3

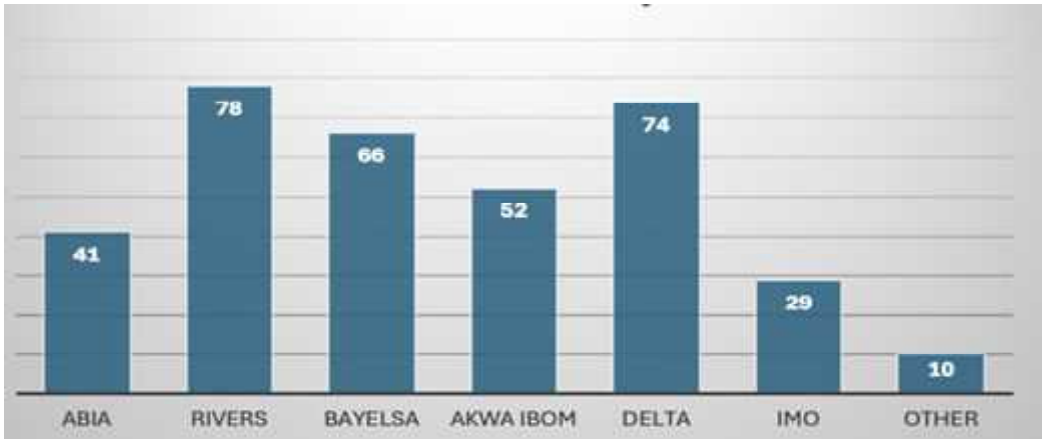
Familiarity with the Belt and Road Initiative (BRI)



A combined 59.1 percent of respondents were either moderately or very familiar with the BRI. However, 14.0 percent remained completely unfamiliar, highlighting the need for improved awareness.

Figure 4

State Location of Respondents



The strategic geographic position of the Niger Delta led to Rivers State and Delta State employees accounting for 22.3 percent and 21.1 percent of the survey participants according to Table 4. The states of Imo and Abia showed reduced participation rates for this investigation, as they counted 8.3 percent and 11.7 percent respondents, respectively, while areas with more participants included Rivers and Delta at 22.3 percent and 21.1 percent, respectively.

Table 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.548a	.300	.287	.294	1.803

Source: Author's Field Survey, 2025).

The independent variables (advert BRI impact and local perceptions) show a moderate relationship with the dependent variable (energy security) based on Table 1 analysis with R = 0.548. Approximately 30% of energy security variation can be attributed to the independent variables based on the 0.300 R Square value. The model reliability is confirmed through the adjusted R^2 of 0.287 since it considers the number of predictors in the analysis. The 1.803 value of the Durbin-Watson statistics confirm low autocorrelation since residuals function independently (Zhang & Ezenwa, 2023).

Table 2

ANOVA Results

ANOVA[a]						
Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
	Regression	12.741	3	4.247	32.435	.000b
	Residual	29.659	346	.086		
	Total	42.400	349			

Source: Authors' Field Survey, 2025.

The ANOVA results in Table 2 establish the statistical significance of the regression model with F = 32.435 and p < 0.05. The results confirm that China's BRI awareness together with its social effects and economic significance serve as major elements explaining differing energy security outcomes between Niger Delta villages.

Table 3

Regression Coefficients

Coefficients						
Model		**Unstandardized Coefficients (B)**	**Std. Error**	**Standardized Coefficients (Beta)**	**t**	**Sig.**
1	(Constant)	1.672	.149		11.222	.000
	BRI Awareness (H1)	.285	.058	.334	4.914	.000
	BRI Impact on Energy (H2)	.241	.065	.312	3.708	.000
	Local Perceptions (H3)	-.168	.062	-.198	-2.710	.007

Source: Authors' Field Survey, using SPSS 24 Output .

The statistical analysis from Table 3 indicates that energetic security perception improves by 0.285 points when China's BRI awareness increases by one unit (p = 0.000). The influence of BRI on energy infrastructure components leads to increased energy security based on a statistical value of 0.241 (p = 0.000). The negative relationship between local perceptions of socio-economic and security concerns (B = -0.168, p = 0.007) suggests that such fearful attitudes may damage the advantages from BRI projects (Okonkwo & Han, 2022).

The quantitative findings provide compelling insight into each of the study's objectives.

Objective 1. To investigate the effects of BRI investments from China on building energy infrastructure in the Niger Delta region.

Research data demonstrates that China's infrastructure deliveries through BRI positively influence energy delivery improvements at a significant statistical level, along with a 0.241 regression coefficient (p = 0.000). The model summary shows that the BRI-related factors

explain 30 percent of energy security variance based on an R^2 value of 0.300. Chinese investment projects in the Niger Delta area have enhanced energy accessibility to coastal and underserved communities as shown in recent studies from Ebegbulem et al, (2022). The research supports the conclusion that properly designed foreign energy collaborations serve as a solution for persistent regional infrastructure problems.

Objective 2. To evaluate the link between China's BRI projects and the present energy security status of the Niger Delta region.

The research established a positive connection between BRI knowledge and energy security results through a 0.285 ($p = 0.000$) coefficient value. People who have better information about BRI projects often view their communities' energy supply to be more reliable and available. Public understanding of the BRI has reached a significant level since 59.1 percent of respondents claim to have either moderate or high knowledge of this initiative. Public recognition and knowledge about development initiatives create significant effects ($F = 32.435$, $p < 0.05$) on energy security evaluations in Niger Delta communities.

Objective 3. To determine how local stakeholders view China's economic and security involvement in energy activities of the Niger Delta sector.

An inverse correlation exists between perceptions about BRI projects and their perceived benefits according to the study findings ($B = -0.168$, $p = 0.007$). The service delivery of infrastructure does not ensure public trust in foreign involvement due to concerns such as community distrust and community fears of exploitation, along with limited community involvement. The perceptions of these projects by community members significantly shape their development reception since they comprise the biggest sample group (29.7 percent). Research by Giadom and Wills (2021) confirms that project outcomes suffer from mistrust toward Chinese firms in addition to inadequate inclusive practices, which generate project-related friction. The study demonstrates why external developers must adopt culturally appropriate implementation approaches to handle local community concerns during the delivery of funded initiatives.

Conclusion

This study establishes that the Belt and Road Initiative of China generated quantifiable improvements in energy infrastructure which enhanced energy security in the Niger Delta region through important statistical relationships between BRI recognition and project investments with better energy results. The research showed that local perspectives, mainly based on economic and security factors, work against maximizing BRI benefits because of the complicated challenges that affect global development. Such projects succeed and remain sustainable after the involvement of China only when they properly understand and meet the expectations and realities of local communities.

Recommendations

1. Given that the study indicates that heightened awareness of the Belt and Road Initiative (BRI) will positively influence energy security perceptions, both Chinese stakeholders and Nigerian authorities should invest in structured awareness programming. This effort can be realized through community town halls, focused media interventions, and education partnerships with local institutions aimed at demystifying the reach, benefits, and conditions underlined by BRI-related projects.

2. A distrust between external investors and host communities is conveyed by the adverse effect of local perceptions (related to socio-economic and security concerns). Government agencies and even Chinese investors should look for more transparent involvement models that engage the community leadership, civil society players and environmental watchdogs through the entire life cycle of a project, starting from conception to completion. This addition will ensure that foreign investment aspirations are synchronized with local expectations.

3. To make BRI energy projects sustainable, meaningful local gains in jobs' creation, skills transfer and infrastructure establishment need to be achieved. Such policies should require community development agreements (CDAs) that promise reinvestment in host communities, thereby improving perceptions or curtailing resistance.

4. Theoretically it is desirable to deal with a formal monitoring and evaluation (M&E) framework for evaluating long-term outcomes of BRI projects on issues of energy security and socio-economic development.

5. Increased synergy between federal, state, and local governments is needed for the successful realization of BRI projects. An integrated task force or inter-agency committee should be constituted to monitor project authorizations and management of stakeholder conflict, particularly where volatile Niger Delta communities are concerned.

6. Even out of mistrust and insecurity being a threat to the advantages of the BRI, targeted investments in security systems such as surveillance, local police, and early-warning mechanisms should accompany all-scale BRI infrastructure projects. Collaborations with local vigilante groups and youth organizations can prevent sabotage and also make a project sustainable.

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Appendix A
Respondents' Biodata

Respondents' BIODATA

For your responses, please tick the appropriate boxes.

1. Age of Respondents

- ☐ 18-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51 & Above

2. Occupation

- ☐ Energy Industry Professional
- ☐ Government/Policy Maker
- ☐ Community Member
- ☐ Business Owner
- ☐ Other (please specify) _____

3. Familiarity with the Belt and Road Initiative (BRI)

- ☐ Not familiar at all
- ☐ Slightly familiar
- ☐ Moderately familiar
- ☐ Very familiar

4. Location (States)

- ☐ Abia
- ☐ Rivers
- ☐ Bayelsa
- ☐ Akwa Ibom
- ☐ Delta
- ☐ Imo
- ☐ Other (please specify) _____

Appendix B
Research Questionnaire

Please indicate your level of agreement with the following statements using the key below:

Key: SA – Strongly Agree; A – Agree; D – Disagree; SD – Strongly Disagree

S/N	ITEMS	SA	A	D	SD
RQ1	**Awareness and Adoption of China's BRI in the Niger Delta**				
1	I am aware of China's BRI and its potential impact on energy security in the Niger Delta.				
2	My community/business has benefited from any BRI-related infrastructure development in the Niger Delta.				
3	China's BRI projects have led to improvements in energy access in the Niger Delta region.				
4	I am aware of the specific BRI-funded energy projects in my area.				
5	I believe the Chinese government is committed to long-term energy security in the Niger Delta.				
RQ2	**Impact of BRI on Energy Security in the Niger Delta**				
6	China's BRI investments have improved energy infrastructure in the Niger Delta.				
7	Energy security in the Niger Delta has significantly increased as a result of China's involvement.				
8	The level of energy supply has become more stable in the Niger Delta due to BRI projects.				
9	BRI projects in the Niger Delta have addressed key energy deficits.				
10	China's BRI involvement has contributed to greater energy independence in the Niger Delta.				
RQ3	**Local Perceptions of Socio-Economic and Security Implications of BRI**				
11	The socio-economic impact of BRI projects on local communities in the Niger Delta has been positive.				
12	Local security concerns have risen as a result of China’s involvement in the Niger Delta's energy sector.				
13	BRI projects have led to job creation in local communities in the Niger Delta.				
14	The presence of Chinese workers and contractors in the Niger Delta has impacted local security.				
15	The local population has benefited economically from the development of energy infrastructure through BRI.				

Thank you for participating.

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MOBILE CLASSROOMS OF SOUTH INDIA: MOBILITY NETWORKS AND THE TRANSMISSION OF INDIAN KNOWLEDGE SYSTEMS IN THE PREMODERN PERIOD

Manvika Shetty

Abstract

South India always harboured decentralised classroom networks in the form of ghmiks, mamhas, agrahras, *and temple schools, which together functioned as "Mobile Classrooms". These institutions were connected through pilgrimage and trade routes, as well as scholarly routes, effectively forming mobility networks for the transmission of Indian Knowledge Systems (IKS). Focusing on South India between the 8th and 15th centuries CE, this paper argues that these routes acted as a bidirectional corridor of knowledge exchange. They enabled the flow of ritual, medical, astronomical, art, and linguistic traditions between regions, ensuring that knowledge was not confined to just one centre but circulated widely across the region. This transmission happened not only within South India but also between the South and other parts of the Indian subcontinent. Case studies such as the Kanchipuram* ghmik, *Chola-period endowments for education, and Ramanuja's scholarly itinerary can be used to reconstruct this decentralised model. Using epigraphic evidence and temple records, this study argues that South India's mobility-linked learning spaces functioned as "Mobile Classrooms", which helped transmit Indian Knowledge Systems, ensuring their prevalence even during times of political upheaval.*

Keywords: **South India, Mobile Classrooms, Indian Knowledge Systems (IKS), Mobility Networks**

Introduction

"Knowledge, when dispersed, becomes immortal; when confined, it perishes with its keepers." (Kosambi, 1965). When we talk about education in pre-modern India, scholars often focus on commonly celebrated centres like Nalanda and Takshashila. However, this focus on a few northern universities has concealed a rich network of decentralised learning institutions in South India. In the South, temples were not just centres of ritual and gathering but were also intellectual hubs that often housed colleges that provided free education in both religious and secular subjects. The famous Ennayiram temple, for instance, could

accommodate 440 students across ten departments. Such examples prove that South India fostered a distributed temple-based as well as decentralised model of education, one that has received less scholarly attention (Luniya, 1978, p. 549).

In this paper, the term "Mobile Classroom" is used not just in a spatial sense, but as a composite pedagogical model. It refers to a system of learning where knowledge transmission occurred through the movement of teachers, students, texts and practices across interconnected institutions such as *ghmiks*, *agrahras*, and *mamhas*. Mobility here is understood in three ways: first, spatial mobility, referring to physical movements of teachers and students and texts along pilgrimage routes, trade networks, as well as scholarly journeys. Second, pedagogical mobility refers to a flexible method of teaching that is not dependent on a fixed classroom, allowing learning to take place in temples and other social spaces. Third, institutional mobility, which refers to the learning centres being able to be relocated across different regions. Together, these elements constitute an interlinked educational network rather than a centralised university system.

While temples such as Ennayiram showcased how education was woven into the social fabric of South Indian society, they were not the only institutions that disseminated knowledge. Alongside these temple-based colleges, various other decentralised forms of organised learning existed, which were often backed by royal patronage. These included the *ghmiks*, *agrahras*, and *mamhas*. These functioned not just as isolated centres but were a part of a wider network, which together reveals that South Indian education was dynamic and interconnected.

Epigraphist F. Kielhorn (19th c.) describes the *ghtik* as an organised establishment of learned Brahmanas, usually founded under royal patronage. While he cautions against equating the *ghtik* with the *goshmhi* (an assembly), his observation highlights the formal and institutional nature of these centres. They were not casual gatherings but structured bodies that provided systematic instruction in Vedic and philosophical texts, often supported by endowments from kings (Narayanan, 1970).

Agrahras, the land grants given to Brahmanas, were one of the most significant decentralised educational units in South India. These were not static, locally bound institutions because epigraphic evidence shows that scholars often moved across regions to settle in these donated villages. For example, during the Later Pallava period (c. 6th-9th centuries),

copper plate charters such as the Pulluru plates record that Brahmanas from the West Godavari and Guntur districts migrated to the Pallava dominions to occupy *agrahras* (Archaeological Survey of India, n.d., Vol. II, No. 34). Similarly, donees from various towns in the Krishna, Guntur, and Godavari regions, including Karamchedu, Tanuku, Velpuru, and Penukaparru, are listed in the Tandantottam copper plates (Archaeological Survey of India, n.d., Vol. II, No. 35). These inscriptions indicate that *agrahras* functioned as a focal point for the intellectual communities, drawing scholarly talent from far beyond the corresponding region, effectively forming a networked system and proving that *agrahras* were not just isolated educational units. This movement of scholars helped propagate Vedic learning, ritual knowledge, and even linguistic traditions, turning the agrahras into active nodes in the larger knowledge network that stretched across South India (Pramanik-Nayak, 2013).

Mamhas were religious or monastic centres which were among the most influential decentralised institutions of learning in premodern South India. They served as centres for the preservation and reinterpretation of sectarian traditions, i.e., Shaivism and Vaishnavism, which made them far from being just passive monasteries. With high-caste elites taking up spiritual and intellectual leadership in the 13th and 14th centuries, *Saiva mamhas* in Tamil Nadu and Karnataka became more active. They also maintained the canon of texts such as the *T–vram* (collection of about 800 devotional hymns in Tamil dedicated to the Hindu deity Shiva). Rivalling the royal power, these *mamhas* created a parallel structure of authority, particularly during periods of political transition such as the decline of the Cholas and the emergence of Vijayanagara power in the 14th century.

The *Sringeri mamha*, one of the four *Amnya Peethas* associated with AdisaEkaracharya, helps us understand how *mamhas* not only acted as an intellectual hub or spiritual centre but also as a protector of intellectual ideas. Such *mamhas* are exemplary in the archives of the Indian Knowledge System.

The *ghmiks*, *agrahras*, and temple colleges of the South are primarily known through scattered inscriptions and local records, making them harder to remodel as a system, unlike Nalanda and Takshashila, for which the majority of historical writing is done due to the survival of detailed accounts from Chinese pilgrims like Hiuen-Tsang (7th century), Fa Xian (5th century) and various other sources, which provide a coherent narrative of those universities. Unlike the university-centric model exemplified by Nalanda and Takshashila,

which was characterised by fixed locations and royal endowments concentrated into a single institutional space, the South Indian model functioned through a distributed ecology of learning. Knowledge did not depend on a single centre but on the circulation of scholars and texts across multiple sites set in the social, economic, and religious networks.

Pilgrimage and trade routes that linked these institutions are usually examined for their economic or devotional significance, rather than their role in transmitting ritual, textual, and scientific knowledge. This paper addresses this gap by highlighting how these decentralised learning hubs, i.e., *ghmiks*, *agrahras*, *mamhas*, and temple colleges, were connected through pilgrimage routes, trade paths, and scholarly travels, and functioned as dynamic "Mobile Classrooms" that sustained and spread Indian Knowledge Systems across South India and beyond. The argument is grounded in a close reading of epigraphy, temple inscriptions, copper-plate grants, and hagiographies, which together reveal the scale, curriculum, and mobility of these institutions.

During the Chola period (c. 9th-13th centuries), temples emerged as primary institutions of education. They were not just isolated places of worship but also educational centres. Regional pilgrimage networks such as the *Sapta Vitanka* and *Atta Virattana* shrines of Ziva facilitated the regular movement of devotees, scholars, and priests, making temples into a meeting point where religious practices, along with philosophical teachings, happened (Champakalakshmi, 2009). By the 14th century, this network became part of a broader pan-Indian network, allowing the continuous transmission of the Indian Knowledge System.

Importantly, many of these monastic lineages forged connections with other Saiva centres across India, like the Tripuri's *Golaki mamha* and the *Bhiksa mamha* of Kashi, creating an intellectual link that integrated South Indian Saivism with traditions beyond the South (Champakalakshmi, 2009). In this way, it is clear that *mamhas* were not only guardians of religious knowledge but also active participants in its transmission across regions. A number of inscriptions, especially those of the Kurnol district of the 13th century AD, provide information about the working of such *mamhas* and their wider educational scope. *Kodiya mamha* at Belgaum is one such example (Luniya, 1978, pp. 607-608).

The Bhakti movement, initially originating in the South, was not confined to a specific region's boundaries. Its ideas and practices travelled beyond the South to the North, having multiple centres in Pandharpur in Maharashtra and Mathura, illustrating how knowledge

spreads along pilgrimage circuits, therefore creating a pan-Indian sacred geography (Luniya, 1978, pp. 547–548). In bhakti texts, there are references to teachers who are associated with the movement in Tamilakam and Karnataka.

During the early medieval period, particularly during the late Chola era, figures like Ramanuja (1017–1137 CE) transformed South Indian temples into vibrant intellectual hubs. Ramanuja's own training at Kanchipuram under Yadava-Prakasa illustrates how towns like Kanchi functioned as intellectual centres where the gurukula model thrived. Ramanuja was able to institutionalise these networks, like pilgrimage routes, which allowed him to travel across regions, therefore interacting with scholars and sharing his ideas. This, in turn, created a decentralised but connected system of *mamhas*, *agrahras*, *ghmiks*, and temple schools that transmitted theology, ritual practice, and philosophy to the masses. Such movements demonstrate that South Indian temples, *ghmiks*, and *mamhas* were not isolated but part of a distributed classroom system.

Ramanuja's life is an ideal case study for understanding how South Indian Knowledge Systems thrived through mobility networks and decentralised institutions. His journeys were not simply religious but were acts of knowledge acquisition and dissemination. In his life, he visited Dvarka, Mathura, Puri, and Tirupati, illustrating how pilgrimage networks functioned as a mobile classroom model of knowledge transmission. Together, these episodes depict South Indian routes as carriers of philosophy and ritual practice functioning much like a decentralised classroom system across the Indian subcontinent.

The Bhakti saints, both the Saiva Nayanmars and the Vaishnava Alvars, were travelling teachers whose movement created a living, mobile curriculum. Moving from temple to temple, they sang hymns, composed verses, and drew congregations into an ongoing dialogue of devotion and philosophy. Their mobility transformed temple towns into nodal points of both spiritual practice and intellectual discourse (Luniya, 1978, p. 542).

Case Studies of Knowledge Transmission

The following case studies illustrate how *ghmiks*, temple complexes, and merchant guilds served as pivotal points in a broader knowledge network. Together, they demonstrate that South Indian education was not static but was mobile. At Kanchipuram, *ghmiks* emerged as centres of advanced study in grammar and Vedanta, attracting students and teachers from

across the subcontinent. At Thirumukkoodal, the temple school was attached to a functioning hospital, showing how sacred and scientific knowledge cohabited. Merchant guild inscriptions reveal that trade networks did more than transport goods; they also funded teaching, temple upkeep, and the feeding of students, effectively sustaining the intellectual life of distant learning centres. Taken together, these examples show that premodern South India's knowledge transmission system operated like a distributed classroom, with temples, guilds, and *ghmiks* forming an interconnected web that supported both religious and secular education.

Under the Pallavas and later the Cholas, *Kanchipuram Ghmik* emerged as one of the foremost centres of education in South India, earning the title "*Ghatika-sthana*", meaning the seat of learning. Inscriptions from Kanchipuram refer to *ghmiks* as organised assemblies of learned Brahmins who specialised in teaching *Vedanta*, *Vyakarana* (grammar), and *M+mAs* (Government Epigraphical Department, 1890). Students and teachers did not merely belong to the Tamil region; instead, as epigraphical records suggest, they hailed from distant parts of India, including regions of Andhra Pradesh, Karnataka, and even further north, demonstrating Kanchipuram's pan-regional intellectual magnetism. The *ghmik*, therefore, functioned as both an educational institution and a centre of scholarly discussion, sustaining and transmitting key branches of Indian Knowledge Systems across regions. Its very location, connected to trade and pilgrimage routes, ensured that knowledge did not stagnate in one place but travelled with scholars and disciples, creating a distributed network of learning rather than a single centralised classroom.

The Thirumukkoodal temple in Chingleput district presents one of the most remarkable examples of a temple functioning as a combined centre of education and healthcare. An inscription from the reign of V+rarjendra Chola (c.1067 CE) (Government Epigraphical Department, n.d.) records detailed provisions for a *[l* (school) that offered food and lodging for its pupils, alongside a hospital with a stock of medicines carefully enumerated in the same record (Sastri, 1955, p. 313). Thirumukkoodal thus serves as an example for how South Indian decentralised institutions combined ritual and medicinal knowledge under one roof.

Epigraphical evidence of merchant guilds such as the Ayyavole 500 and Manigramam shows their extensive involvement in funding education and temple maintenance. Inscriptions record endowments for feeding students, teachers' salaries, and supporting temple libraries,

often in locations far from the merchants' own regions of residence (Karashima, 2009). This demonstrates that knowledge transmission was not just a religious or royal priority but a shared economic and civic concern. Merchant guilds, operating along trade routes that connected South India with Southeast Asia and other parts of the subcontinent, therefore, acted as patrons for the movement of knowledge itself. Their investments helped sustain decentralised learning centres, enabling students and teachers to travel and exchange ideas without fear of economic insecurity. This patronage system ensured that intellectual life was resilient, decentralised, and deeply tied to the flow of commerce, reinforcing the argument that mobility networks were essential to the survival of Indian Knowledge Systems.

Mobility in Preventing Centralisation

One of the most distinctive features of South Indian knowledge traditions was their decentralised character. The Tamil and Deccan regions nurtured a distributed ecosystem of *ghmiks*, temple schools, *mamhas*, and *agrahras*. Each of these centres functioned semi-independently yet remained connected through pilgrimage routes, scholarly debates, and merchant guild networks. This ensured that intellectual activity was not tied to a single location. When Ramanuja was forced into exile by the Chola king Kulottunga I, he established new centres of learning in Karnataka, most famously at Melkote, thereby extending Vaishnavism beyond its point of origin, the Tamilakkam (Srinivasa Aiyengar, 1908). This distributed and mobile education system acted as a safeguard against disruption, i.e., even when political upheavals or invasions affected one centre, knowledge continued to flourish elsewhere. For example, according to later hagiographic sources, Kanchi was said to have been sacked, and Jain and Shaiva scholars in the 10th century were temporarily displaced, but many resettled in Tiruvanaikkaval and Chidambaram. Similarly, when northern universities like Nalanda were destroyed by Turkic invasions in the 12th century, much of Buddhist intellectual activity in the South survived precisely because it was dispersed across many smaller centres rather than concentrated in one. This emphasises that South Indian temples and *mamhas* experienced no comparable rupture; in fact, they helped displaced scholars and texts, and preserved them.

Beyond local parishads, ancient India witnessed larger gatherings where thinkers, sages, and scholars from diverse schools debated philosophical and theological issues. References to such congresses are found in the *Brihadaranyaka Upanishad* and the *Satapatha Brahmana*,

suggesting that these were regular forums for cross-regional intellectual exchange (Luniya, 1978, 566). Royal courts, too, became vibrant intellectual centres, hosting eminent teachers, philosophers, and scholars. Courts such as those of King Janaka of Videha and King Pravahana Jaivali of Panchala attracted thinkers of different schools, enabling the cross-pollination of ideas and contributing to the advancement and diffusion of culture (Luniya, 1978, p. 566).

Conclusion

The evidence from epigraphy, temple records, and hagiographies makes clear that South Indian knowledge traditions thrived not because of fixed, centralised universities but because of a decentralised web of institutions sustained by mobility. *Ghmiks*, *mamhas*, *agrahras*, and temple schools operated as a "Mobile Classroom Network" where knowledge continuously circulated along pilgrimage paths, trade routes, and other mobility networks. This system protected Indian Knowledge Systems against political upheaval and invasions, ensuring that they were not extinguished but renewed across new phases of intellectual activity. By decentralising and mobilising knowledge, South India not only preserved its scholarly traditions but also contributed to the formation of a pan-Indian intellectual network. This model demonstrates that the durability of learning lies not in monumental centres alone, but in the movement, adaptability, and interconnectedness of its carriers. Therefore, South India's learning institutions demonstrate that the strength of Indian Knowledge Systems did not lie in singular centres but in the interlinked networks that operated as Mobile Classrooms, thereby creating a dynamic system of knowledge exchange.

This decentralised and mobile educational model that is observed in premodern South India offers significant insights for contemporary debates on education. This is in contrast to the modern education system, which is often heavily centralised, state-dependent, and vulnerable to political influences. This model emphasised adaptability and community participation, and learning was not confined to institutional walls but embedded in the social life, allowing knowledge systems to survive transitions. This example in history initiates discussions on decentralised education, flexible pedagogies, and mobility-based models, which are highly relevant in this era where education is marked by digitisation, regional disparities, and centralisation.

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GENERATION Z AT CROSSROADS: BALANCING DATING ATTITUDES EMBEDDED IN INDIAN CULTURE

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Abstract

Gen Z comprises people born between 1997 to 2012. This generation has witnessed the astronomical rise in the usage of social media. This generation is caught at crossroads, trying to optimally use technology, within the context of the Indian value system. A qualitative exploratory design was adapted to understand the dating attitude of undergraduate college students in context of Indian cultural values. Purposive sampling was done to select 6 males and 6 females participants, in the age range of 18-22 years and accessed WhatsApp and Instagram for at least 6 hours per day. Focussed group discussions were conducted for the two genders separately. The themes which emerged points towards Indian Gen Z striking a novel balance between contemporary outlook and traditional Indian cultural and moral values. For choice of a dating partner Gen z's emphasised that beside physical appearance, they also need to form an emotional bonding, understanding, and mutual respect with their prospective partner. They also voiced their apprehensions about the rampant practice involving misuse of technology to distort reality and project false ideal images. It creates confusion about whether a dating partner is suitable for them or not.

Keywords: **dating, generation-z, artificial intelligence, value system**

Introduction

The term relationship is subjective. In the past couple of years, the meaning and understanding of this term has changed drastically. Texting and calls have taken over the letter writing era thereby altering the meaning and essence of relationships. Gen-Z, born between 1997 to 2012, are trapped in this cycle of technological advancement, which is also impacting their dating attitudes.

India is a country which is rich in its cultural heritage, with strong belief in the sanctity of the institution of marriage. It was an acceptable practice for families to select suitable partners for the eligible bride or groom. the times

Review of the Literature

The dating perspectives and anticipations of adults are profoundly shaped by their belief systems. Gen Z (Geiger, 2025) presents an important generational context, as their viewpoints connect to evolving values, embedded in the Indian traditions.

Bejanyan et al. (2014) noted that Indian young adults prioritize lasting marital stability, cultural alignment, and family endorsement when selecting romantic partners, highlighting collectivist principles. Some other studies highlight a "negotiated choice" process, involving an evolving value system that merges familial traditions and social norms with independence.

Kaushik et al. (2024) noted that Gen Z is integrating emotional wellness, emotional support, effective communication, personal autonomy, cultural norms, while still being influenced by traditional values.

Bejanyan et al. (2014), observed that Indian participants prioritized qualities like commitment, cultural alignment, and responsibility more than their American counterparts. Shrier and Blood (2015) found a link between perceived relationship quality and emotional closeness among emerging adult couples. Emotional intimacy often precedes or occurs alongside physical intimacy. Doherty (2025) studied the Gen Z choices of attributes in their dating partner. Some of these were compatibility, communication abilities, emotional openness, long-term commitment, stability, empathy, and emotional security.

Collectively, these studies indicate that Indian Gen Z prioritizes ethical and practical qualities in a dating partner besides physical appeal.

Wu and Kelly (2020) explored how language created by algorithms in dating profiles influences trust and attractiveness. Their findings suggest that while individuals might be drawn to AI-crafted profiles, their sense of authenticity decreases once they learn about the AI's role. Hence, despite the nature of modern dating, authenticity and truthfulness remain crucial foundational qualities.

Battisti (2025), the originator of the second-person authenticity concept, reported that the perceived genuineness of bonds could be compromised when AI facilitates human interaction involving creating romantic texts or emotional replies.

Modern dating choices point towards an emerging conflict between technological ease and issues related to accountability, sincerity, and emotional investment.

An essential element of partnerships is the cultivation of intimacy , explored through both emotional and physical lenses. Intimacy is fluid and influenced by context, and important for creating satisfying intimate connections. These studies cumulatively imply that intimacy among Indian Gen Z is a complex and dynamic process that is negotiated across emotional, physical, cultural, and technological components.

Overview and Relevance of the Study

Rationale

Generation-Z is at a crossroad while making choices of their life partners. They are in an era where relationships are temporary and hugely being defined and moulded by the internet and AI. The key challenges being faced by them is: how to navigate through what is genuine and what is false? Further, do males and females differ while choosing their life partner?

This research can help teachers and counselors to understand how and why Gen Z thinks in a certain way. It will also be beneficial to app developers to formulate better online dating platforms which are more reliable, transparent, and reduce misunderstandings and conflicts.

Understanding Gen-Z's narratives can lead to formation of healthy and fruitful relationships.

Research Questions

1. How do Gen Z Indian males differ from their female counterparts in their dating attitudes?

2. Are there gender differences among the Indian Gen Z population regarding the extent to which family approval, religious background, and cultural traditions shape their dating choices?

3. What is the gender difference among Indian Gen Z individuals with regard to the importance placed on physical attractiveness, education, career level, and financial stability while choosing a partner?

4. How do Indian Gen Z males and females differ in their perceptions of authenticity and trust when dating involves online profiles, Al-generated communication, or photo filters?

5. Do the Gen Z Indian males differ from females in the importance accorded to emotional closeness versus willingness to engage in physical intimacy?

Methodology

Research Design

The study employed a qualitative exploratory design and utilized two Focus Group Discussions (FGDs) for the data collection.

Operational Definitions of variables

Dating

"Dating is a social activity that involves two individuals getting to know each other romantically with the potential of a long-term relationship." (Doherty, 2025)

Attitude

According to the American Psychological Association (n.d.), an attitude is a "relatively enduring and general evaluation of an object, person, group, issue, or concept on a dimension ranging from negative to positive".

Gender

According to the American Psychological Association (n.d.), gender is a social construct that includes the socially constructed roles, behaviors, activities, and attributes that a society associates with different genders, as well as the associated

Generation Z

In order to keep the Millennial generation analytically meaningful, and to begin looking at what might be unique about the next cohort, Pew Research Center decided that anyone born between 1997 to 2012, will be part of the Generation Z.

Sample

Twelve participants (6 Females and 6 Males) belonging to Gen Z, with age range between 18 years -22 years, were selected.

Inclusion Criteria

1. Accessing social media apps WhatsApp and Instagram for a minimum of six hours per day
2. They were not in any committed romantic relationships since the past 6 months
3. Well versed in English language

Exclusion Criteria

1. Suffering from any major Psychological disorders

Participants

- Participant 1, is a 19 years old female, belonging to a Hindu family and has been in a relationship once previously.
- Participant 2, is a 20 years old female, belonging to a Hindu family and has never been in a relationship before.
- Participant 3, is a 18 years old female, belonging to a Hindu family and has never been in a relationship before.
- Participant 4, is a 18 years old female belonging to a Hindu family and has been in a relationship once previously.
- Participant 5, is a 20 years old female who belongs to a Hindu family and has never been in a relationship before.
- Participant 6, is a 21 years old female who belongs to a Hindu family and has never been in a relationship before.
- Participant 7, is a 19 years old male who belongs to the Parsi community and has never been in a relationship before.

- Participant 8, is a 22 years old male who belongs to a Hindu family and has been in a few relationships previously.
- Participant 9, is a 20 years old male who belongs to a Hindu family and has been in a relationship once previously.
- Participant 10, is a 20 years old male who belongs to a Christian family and has been in several relationships before.
- Participant 11, is a 20 years old male who belongs to the Hindu community and has never been in a relationship before.
- Participant 12, is a 20 years old male who belongs to a Hindu family.

Data Collection

A semi-structured open-ended interview schedule was created along the lines of the concepts under study, namely, dating preferences, cultural pressure, gender roles, freedom, attractiveness, status, and expectations in relationships. It was edited and validated by three subject experts. It was used for the two focused group discussions. The focus group discussions were moderated by the primary researcher, under the guidance of her professors. The moderator's role was to facilitate the discussion using a semi-structured guide, encourage participation from all group members, and gently probe responses where clarification or elaboration was required. Care was taken to ensure that no single participant dominated the discussion and that a comfortable and respectful environment was maintained throughout the session. A co-moderator was present during the discussions and assisted by taking notes, managing time, and observing non-verbal cues, which supported the overall flow and depth of the discussion. With consent from all participants the entire process was recorded, transcribed, and coded. Ancillary observations regarding non-verbal cues and expressions were also noted. The FGD was conducted for 90 minutes with each group.

Data Analysis

Thematic analysis (Braun & Clark, 1996) was carried out using the following steps: (1) familiarize oneself with the data by reading and rereading it; (2) generate initial codes to identify potentially relevant data features. The data were initially coded by the primary researcher and subsequently reviewed in discussion with another researcher to refine and

finalise the codes; (3) search for themes that capture significant concerns revealed in the data; (4) review the potential themes to ensure accurate representation; (5) define and name themes to describe their uniqueness and specificity; and (6) produce the final report describing the best-derived story based on the analysis.

Table 1

Themes and Sub-themes

Theme
1. Value System
1.1 Religion 1.2 Commitment 1.3 Institution of Marriage
2. Attributes of a Dating Partner
2.1 Physical Attraction 2.2 Age 2.3 Status 2.4 Intellectuality
3. Artificial Intelligence
3.1 Improve Communication 3.2 Enhance Appearance 3.3 Perception of an Ideal Partner
4. Developing Intimacy

Value System

This theme primarily explores what participants seek and value in a romantic relationship. It reflects the significance of having aligned beliefs and values that shape a person's behavior. It explores people's beliefs, ways in which their affection is manifested and their outlook towards marriage. The sub-themes found under this are:

Religion

The female participants agreed that religion is an important aspect to consider before dating someone. Sharing the same religion is preferable as it will involve having a comfort zone with similar cultural, moral and ethical values, higher acceptance by families, and a greater comfort zone. Additionally, they would respect their partner's religion and would not be tolerant if their partner forced or imposed their religious values and beliefs on them.

P5 (F/20yrs): *"Being from the same religion also gives a kind of a sense of comfort. Knowing that you're somewhere similar to your values and your families. There's a kind of familiarity. Additionally it would be a smoother transition and it would be easier for their families to connect."*

The male participants stated that religion is important and their family stresses it much more. So, it may become a point of contention later due to moral values. Their families should accept their relationship and no one's sentiments must be hurt. Their partner and her family must be open-minded.

P10 (M/20yrs):*"The real thing that matters is that we share common moral values".*

Commitment

Commitment in a relationship is manifested as loyalty, honesty, respectfulness, exclusivity, truthfulness, consistency in conduct, and emotional maturity. These are significant underlying principles that form trustworthy relationships. It also involves future planning and aligned goals. The female participants expressed all the above thoughts and also reported that introducing one's partner to friends and family will be an important step in a relationship. Actions involving involvement and responsiveness towards each other are the two pillars of commitment in relationships.

P2 (F/20yrs):*"I feel like commitment is showing up for the other person and letting them know that you are there for them".*

The male participants stated ways in which they express commitment to their partner. Their approach to commitment was more action oriented. They stated that introducing their partner to their family and friends is an important step in a relationship. They mentioned the significance of loyalty and exclusivity to maintain commitment in a relationship.

Additionally they would prefer their partner to be raw, vocal, blunt, and practical, while also being kind, humble, and communicative. The significance of exclusivity is stated by this participant, P7 (M/19yrs): *"For me exclusivity is important. It is the first step of commitment."*

Institution of Marriage

This sub theme highlighted what views do Generation Z currently hold regarding marriage, and whether they consider it as a path of end goal or not. Statements about family acceptance, shared values, religious harmony, and commitment were repeatedly linked to concerns that typically arose when considering marriage. This revealed that marriage operates as an implicit long term marker in their dating choices. However, both the gender groups had a different outlook. Female participants considered marriage to be a valid endpoint of dating a partner and assess partners based on long-term compatibility. It influences how seriously they date and whom they choose.

P4 (F/18yrs): *"If I'm thinking of dating someone and marrying him later, their religion, personality, grooming, background matters to me quite a lot."*

Male participants did not necessarily look for partners from the mindset of "dating to marry". Marriage is not directly tied to current dating decisions. Their focus is on present compatibility rather than planning for the future.

P7 (M/19yrs): *"Like I don't want you to be thinking what you'll be doing 50 years down the line, but of course I want you to think what probably we'll be doing in the next three years, say four years from now, once I've graduated."*

Attributes of a Dating Partner

This theme explored how participants define the essential characteristics they look for in their partner. The discussion revealed a move from rigid conventional standards toward a subjective and holistic opinion that focused on emotional connection, shared values and future stability. Sub-themes were as follows:

Physical Attraction

Both genders felt that physical attraction might be important initially, but later what matters is deeper emotional connection and feelings of joy in the company of each other.

Both genders had a very clear distinction of what features attracted them. Female participants took a holistic view of attractiveness, preferred tall men with a good dressing sense who were fit, kind and respectful. While the male participants found only specific features like eyes and smile attractive.

P5 (F/20yrs):*"Yeah, I mean someone who knows to carry himself not just in materialistic manners like clothes or anything but just the way in his attitude or confidence and the way the person treats others.And physically I mean someone who is fit and healthy not trying to stereotype in a very six pack abs kind of way but just someone healthy and fit".*

P7 (M/19yrs): *"I believe putting physical attractiveness is a very tricky situation because in the eyes of someone who has feelings for another, that person is the most beautiful person in the world. It simply doesn't matter if they're standing next to Emma Watson, Emily Ratajkowski. That person is the world for them."*

Age

Most participants gave more importance to maturity and compatibility than chronological age. Although, female participants stated they wouldn't be comfortable dating someone younger. As for men, age didn't really matter and they were open to dating younger or older women as long as qualities were met. The following comments support the above:

P6 (F/20yrs): *"Maybe it's a stereotype or something. I don't know what it is but I just can't date someone younger."*

P10 (M/20yrs): *"As long as all the previous things I've mentioned are met, I don't care about age."*

Status

Status was not just interpreted as wealth or power but how one presents themselves and the ambitions they carry. Both genders stated that they did not want a partner with a lower financial stability relative to them and would ideally want a partner who is goal-oriented and working toward a stable career. The male participants placed more importance on having a partner who knew how to manage their finances and make smarter financial decisions.

P12 (M/20yrs): *"If happiness comes at the cost of overspending, it's not sustainable."*

Intellectuality

Finally, intellectuality rose as a central pillar and was defined by education level, financial sense, and decision-making ability, showing a focus on long term partner workability. Both genders stated that they would ideally want their partners to match their education level, even if their backgrounds don't match.

P2 (F/20yrs): *"I would say for me, education is obviously important and so is career."*

Artificial Intelligence

This theme tried to understand how Gen Z is interacting with AI and how it has impacted their dating space. As AI has become increasingly prominent in today's fast-paced technological world, it is bound to influence personal lives, just as it has affected professional lives.

Improving Communication

This sub-theme focused on participants' opinions on the use of AI in everyday communication. When asked about a partner using AI to edit or generate text messages, most participants reacted negatively and described it as a 'red flag' particularly in the context of emotional conversations. Participants would much rather talk to the chatbot themselves and not have their partner as a bridge between them.

Male participants were generally more accepting of AI being used for basic grammar correction or sentence framing, as long as the message still reflected the person's own thoughts. However, they were clearly against AI being used to create emotional or expressive messages, as this was seen as inauthentic. Female participants, on the other hand, were more uncomfortable with the use of AI in communication, as it would mean misrepresenting feelings. Female participants prefer unedited, imperfect communication that reflects genuine emotions.

P4 (F/18 yrs): *"I think it's an absolute red flag. You are not that person. I am talking to a third person in short and that third person is not the one I signed up for. Like, It's a very big red flag and just being yourself is a big part of the relationship, which you're not."*

P7 (M/19 yrs): *"So to put it bluntly, I would rather, you know, date the chatbot than you. because if you rely on a chatbot for your personality, it's kind of disturbing, but at the same time, if they're using it to aid their sentences as they're not really naturally very good at it and they really want to make an impression on you, that's absolutely fine. However, if you want to make an impression, I mean, if you use the chatbot for that, that's absolutely fine. Just don't make using that chatbot your whole personality, because then the chatbot's gonna get, you know, my attention."*

Enhance Appearance

This sub-theme focused on the use of AI to enhance one's appearance, such as tweaking facial features through AI editing, changing height or weight to look more presentable or to make one's profile appear better on social media or dating sites.

Both male and female participants came to the conclusion that using AI to change one's looks, to create a deepfake version resembling a celebrity, is clearly identified as catfishing. Only hiding scars or minor blemishes using AI was considered acceptable by most participants. One key gender difference emerged in how certain changes were perceived. Male participants did not find tweaking height or weight particularly alarming, however, altering one's hobbies was viewed as a major red flag, as hobbies are often the starting point of conversations and building connections. In contrast, female participants felt that tweaking hobbies was acceptable if done to match or impress a potential partner. However, altering height or weight was seen as unacceptable, as it was perceived as lying about one's real self.

P2 (F/20 yrs): *"I think it is something that we discussed earlier also about lying about your height. It brings us back to the same question that it is something that you shouldn't lie about using filters or AI tags. It's basically catfishing if you're not truthful or if you can't show your real self to your partner."*

P10 (M/20 yrs): *"Again, this goes back to my take on tweaking of height in a way. If it's like clearing out small blemishes, cool. Like, honestly, I get it, you're insecure. I would do the same. I would clear out my acne. Like if I was in 10th, I would have cleared out my acne before like video calling somebody or something. So that's fine. But if it's like, you look like this, but then you look like something else, like as someone previously said. Catfishing, if it's catfishing then bye bye. I am not in, sorry."*

Perception of an Ideal Partner

This sub-theme talked about the use of AI to create a 'perfect partner', that is, an AI partner who ticks all the boxes one looks for and has the exact personality the person desires. Participants were given the option to choose between a human partner and an AI partner who fulfils all their expectations. Both male and female participants came to the same conclusion that they would choose a human relationship. According to them, imperfections are what make a relationship real, and if those imperfections are taken away, the relationship would become predictable, dull, and boring.

P2 (F/19 yrs): *"I think I agree with both of them because, like, the unpredictability is completely perfect. When you go through hardships and difficulties together, that is what makes you fond of each other and that is what makes you appreciate each other more and that is how humans are. We are never perfect and if we get something that is perfect, we wouldn't appreciate that because we come to appreciate good times only when we experience hardships, right? So that is why."*

P7 (M/19 yrs): *"Ok, off the philosophical tangent perfection means there's no room for improvement, no room for growth. I, as an individual, believe that dating is the process of bonding with someone and growing with them. If you are already perfect and if you are of course so artificial that by definition means you have no soul. And I would never, you know, even if I had to, I would never go for someone or something without a soul. If you're not perfect, that's fine, there's flaws that are beautiful about someone and it's the flaws that make someone human. And I personally could never be caught, shared, doing or having a preference for AI generated people or perfect people over, you know, an authentic real human being."*

Developing Intimacy

The participants spoke about the importance of feeling emotionally connected in order to be physically intimate with their partner.

They stated that emotional intimacy increases their willingness to engage in physical intimacy. Understanding your partner's needs and making them feel comfortable is a significant step in developing intimacy.

The female participants stated that emotional intimacy is an essential prerequisite

when it comes to engaging in physical intimacy. They mentioned that emotional closeness builds trust and safety in a relationship. This results in them feeling comfortable enough to express and communicate their sexual needs to their partner. They noted that feeling emotionally close to their partner may enhance their experience of pleasure. The significance of emotional closeness is emphasized.

P2 (F/20yrs): *"I personally see emotional closeness as a ladder towards physical intimacy"*.

The male participants stated that emotional closeness is required to understand your partner's preferences and the level of physical intimacy that they are comfortable with. They mentioned that emotional intimacy highly influences their willingness to engage in physical intimacy. They also noted that physical intimacy should be something that is pleasurable for the both of them and should not end up feeling like a task.

P7 (M/19yrs): *"So basically I would say that, yes, a high level of emotional intimacy is very important"*.

P9 (M/20yrs): *"If you're close to someone emotionally, I think physical intimacy comes with it"*.

Results and Discussion

The findings from the two focus group discussions revealed clear differences in dating attitudes between male and female participants. Male participants mostly responded by describing how they behave as partners, with their answers being more action-oriented and focused on what they personally do within a relationship. In contrast, female participants tended to frame their responses around what they expect from a partner. Their answers focused more on expectations, standards, needs, and the qualities they look for in a relationship rather than their own actions.

A major part of available literature on dating culture has been generated from Western viewpoints, focusing primarily on emotional closeness, autonomy and growing use of technology in relationships (Doherty, 2025; Shrier & Blood, 2015). Although such research work is highly informative about contemporary trends in dating, it fails to highlight dating trends in non-western nations. Research studies undertaken in India have observed that younger generations continue to attach equal importance to communication, trust, and selecting

partners while considering factors like family approval, religion, and sociocultural aspects (Kaushik et al., 2024). The present research work validates such aspects and extends them to reveal how Indian Gen Z has increasingly tended to blend such traditional viewpoints with those pertaining to relationships. A previous study conducted by Bejanyan et al. in 2014 largely portrayed how relationship choice in younger adults is driven by family norms and collectivist beliefs. However, from this study a transition in mindset is identified because authentic qualities, financial acumen and individual choice have become important considerations among these relationship choosers, in addition to family and religious affiliations. A blend of both collectivist thought and individual choice may have emerged in these decisions, thus divulging the transitional nature of Generation Z relationships, with tradition meeting modernity in India. Furthermore, although previous studies pertaining to technology and dating were mainly focused on algorithm-driven pairing and self presentation through profiles (Wu & Kelly, 2020), the current study takes into consideration updated digital issues which have arisen due to development in Artificial Intelligence technology. The present research highlights a distinct awareness and reservations too with regard to AI-powered messages, face smoothening filters, catfishing to create ideal AI generated partners.

Implications of the Study

The implications of these results have a special significance in connection with counselors, relationship educators, and mental health practitioners working with Generation Z. The essence of commitment, authenticity, and emotional intelligence in relationships can be used in relationship therapies and psychoeducational programs with this generation. Moreover, awareness of concerns pertaining to AI participation in courtship can help in handling concerns in connection with trust, communication, and unrealistic expectations in relationships.

Limitations of the study

The small sample size of this study, with focus only on participants residing in Mumbai city, India, restricts generalizability of the results.

Suggestions for future research

Future research studies can therefore focus on larger samples from varied age groups, geographical regions, and socioeconomic strata of the society. Both qualitative and quantitative research methodologies can be used in the future research.

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Appendix

Semi-structure open-ended interview schedule

Q1. If you had to choose between someone who's very physically attractive with average status and someone less physically attractive with high status, how would you decide?

Q2. How important is it for your partner to have similar education, career level, or financial stability?

Q3. When you think about someone you might date or marry, how important is it to you that you share the same religious background?

Q4. Some people say commitment is shown g. Which actions do you feel are most meaningful, and why?

Q5. How does feeling emotionally close to someone influence your willingness to engage in physical intimacy?

Q6. Can you imagine dating or getting intimate with someone older or younger? Q7. If someone tweaks their dating profile a little (height, weight, hobbies), is that harmless or a red flag?

Q8. Imagine you find out that most of the texts you've been receiving from someone you're dating were generated with AI suggestions. How would that make you feel about the relationship?

Q9. Think about a future where AI could create a "perfect" dating partner who communicates exactly how you want. Would you prefer that over the unpredictability of real human communication?

Q10. Suppose someone always uses AI photo filters or apps to enhance how they look when chatting or video calling. How much does that affect your trust?

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SEX WORK, SECRECY AND SURVIVAL: MALE SEX WORKERS' LIVED REALITIES AMID INDIA'S LOCKDOWN

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Abstract

India's COVID-19 crisis and the strict lockdown measures entailed implementing drastic measures like maintaining physical distance, wearing masks, hand hygiene, curfews to restrict social interactions and travel restrictions, remote working, and business closures. These measures disproportionately affected the marginalised communities, including sex workers. Sex workers across the states of Delhi, Tamil Nadu, Pondicherry, Kerala and Andhra Pradesh, were interviewed to gain insight into the extent of the impact of the pandemic on their lives. Focused group discussions with male sex workers highlighted similar challenges of economic deprivation and loss of essential living amenities. Male sex workers, who were leading closeted lives due to familial and societal pressures, revealed a dual distress experienced since sex work for them was not only for supplementing their income but also for sexual gratification, which they could not experience in their heterosexual marriage. This nuanced study offers a different perspective on the socio-cultural experiences of male sex workers, looks at their struggles while leading closeted lives, and how these challenges were further intensified during the pandemic. The article further emphasises the need for policy responses that acknowledge the vulnerabilities of this underrepresented group.

Keywords: **Male sex workers, effect of Covid-19 lockdown**

Introduction

The male sex industry is largely hidden, more so than the female or transgender sex worker groups, making them a difficult population to access for open dialogues regarding the private aspects of their lives.

The global COVID-19 pandemic had profound effects on people globally, with the marginalised communities bearing the brunt of its varied impacts. Among the marginalised communities, the least in focus are male sex workers (MSWs) who face unique challenges due to the existing cultural and socio-economic disparities in society. Dialogues with male sex workers brought to the fore not only the social disadvantages they face in their daily

lives but also their increased distress during the lockdown period. Multifaceted issues like judgmental attitudes, internalised shame, and social stigma, which often manifest as diminished self-esteem, self-blame and reluctance to seek support, are driving forces which negatively impact their daily realities and help-seeking behaviour, especially during a crisis. As Cornish (2006) notes, "The most profound stigmatisation often occurs at the intersection of multiple forms of exclusion."

Background and preexisting vulnerabilities of MSWs

Economic Marginalization

The economic marginalisation of sex workers is one of the important factors that drives them into the profession. Due to lack of employment, alternative opportunities, or supportive skills, many turn to sex work as a means of survival for themselves and those dependent on them. The cycle of vulnerability and marginalisation is reinforced by this economic precarity, increasing the risk of exploitation.

Sexual Identity and Gender Nonconformity

Male sex workers have to grapple with their sexual identity, especially in the Indian culture, which holds rigid traditional notions of masculinity (Dandona et al., 2006). Men who are non-gender confirming are often subjected to stigma, harassment, and social ostracisation, amounting to intensified internal conflict regarding identity and disclosure.

Internalized Shame

Sex work is a highly stigmatised profession, and in India, male sex workers face additional discrimination due to the existent heteronormative biases, gender norms, rigid social expectations, and prevalent cultural taboos regarding sexuality and masculinity (Scoular, 2015). These beliefs often lead to male sex workers' increased self-doubt, sense of shame, and fear of ostracism, resulting in their inability to discuss their sexuality or seek support in any manner.

Concealment and Dual Lifestyles

Most male sex workers conceal their sexual identity and profession to avoid discrimination and maintain social acceptance for themselves and their families. To preserve

family relationships, many MSM (Men who have Sex with Men) agree to heterosexual marriages, hiding their sexual orientation from families and partners. This arrangement of dual lifestyles results in constant vigilance and emotional suppression, leading to psychological stress and emotional distress. Added to the financial support, sex work often provides male sex workers a release from the suffocation of living in these heterosexual relationships as well as an opportunity for exploring their sexual preferences and forming/maintaining romantic relationships. The lockdown abruptly curtailed this possibility of sexual exploration and meeting intimate partners of their preference for close to two years, adding to their mental health struggles.

Legal Framework

In India, sex work is no longer illegal, but various activities associated with it, like soliciting and brothel-keeping, are criminalized under the Immoral Traffic (Prevention) Act, 1956 (Kotiswaran, 2011). This creates a legal ambiguity for male sex workers, rendering them vulnerable to exploitation by law enforcement personnel and limiting their ability to seek legal support.

Transactions and Negotiating Powers

The dynamics of transactional sex, where money or other compensation are exchanged for sexual services, are a common factor among sex workers. These transactions place the clients at an advantage and in greater control of the negotiations. During times of crises like the pandemic, the economic need of the sex worker being higher places them in a situation of vulnerability with reduced negotiating power in terms of money and safe sex practices.

Online and Digital Platforms

Globally, the pandemic period saw an upsurge of online and virtual services in the sex industry. Sex workers who had access to private spaces, knowledge of these platforms, and could afford the necessary devices, resorted to these options for added income. The digital divide played a significant role here, as for marginalized groups hailing from economically backward communities, living with families in smaller spaces, or without the knowledge to access these platforms, virtual sex selling was not an option. (Sanders et al., 2020).

Research Aims

Prior studies reflect that the preexisting vulnerabilities faced by the MSWs are uniquely different and unlike those of their female counterparts, yet the studies reflecting these are limited. This study aims to gather insight into the lived experiences of the MSWs belonging to marginalized sectors in rural India, to contribute to researchers' and policymakers' interventions aimed at identifying the needs of the MSWs.

Research Methodology

Five respondents were recruited from remote villages of the Union Territory of Pondicherry, Tamil Nadu, India. Individual in-depth interviews and a common group discussion were held with the volunteer respondents on 29/5/2025. The objective of choosing respondents from this geographical area was to gain insight into the unique experiences of this marginalized group, whose challenges were compounded due to the multifaceted issues of belonging to a lower-income, remote, traditional, and less educated background.

Participants were chosen through purposive sampling and a qualitative research design was used to gather the lived experiences of the MSWs. The participants were assigned male at birth, did not identify as a woman or gender queer, were between the ages of 40 to 55 years, married to cisgender women and provided services to other men. The educational qualification of the participants varied between the 5^{th} std to 10^{th} std. The regular source of income for 3 of the participants was working in the fields, while 2 others worked as daily labourers.

Written consent for the study was obtained after explaining the contents to the respondents. Audio recording was made of the interview with the consent of the participants. The response was in Tamil, and the data was translated into English.

A qualitative interview guide with primary questions and additional probing questions was formed. The questions focused on:

1. The Impact of COVID-19 pandemic and lockdowns on the lives of sex workers.
2. Impact of COVID-19 on the lives of the family, friends and co-workers of the sex workers.

3. The preexisting vulnerabilities of the lives of the sex workers affected by the lockdown, implications of these on their daily lives, and the disparities created

Results

India witnessed one of the largest and most stringent lockdowns globally with a shutdown on transportations and restrictions on all non-essential travel. Participants expressed their helplessness in the scenario and shock that the lockdown lasted such a long time, especially since none of them had heard of similar situations to help them prepare mentally. As the lockdown period extended from the first to the second phase, the effect on the lives of the sex workers became increasingly dire.

As the excerpts from the interviews were analyzed, certain common themes emerged. These included:

1. Financial stress/lack of income
2. Reduced negotiating power
3. Food shortages/insecurity
4. Lack of support
5. Social isolation
6. Emotional distress

The sex worker community as a whole was drastically affected by the global COVID-19 pandemic and the ensuing stringent preventive measures by governments, like social distancing and lockdowns. In an industry that functions largely based on physical contact, the restrictions enforced were a blow to their means of income (Reza-Paul, S. 2022). The interviews with male sex workers reflected the drastic reduction in income and the resultant economic strain placed on their lives. The participants hailed from villages that are remote and less accessible as compared to their counterparts who live in cities, who were able to avail support provided by the government, agencies, or NGOs. The MSWs faced the debilitating effects of the pandemic, exacerbated by the lack of access to transport and communication systems.

The heightened vulnerability of their situation and lack of negotiating power due to lack of income was reflected by a participant who was HIV+ but was forced to agree to sex without condoms.

Participant 4: *"I went to the main road with great difficulty a few times. I got a few clients who wanted to have sex without condoms. Since I am HIV+, I usually insist on safe sex, but this time I was in need of money and quietly agreed. It was wrong but I had no other way to survive."*

Lack of income and inability to work increased the food insecurity experienced by the MSWs and caused significant distress. Even basic survival became challenging at a time when police patrols were frequent, and restrictions on movement were enforced.

Participant 2: *"We used to cook what we could gather—wild roots, vegetables from the jungle. That was how we survived. Whatever savings we had, we spent during those days, and now I am left with nothing."*

Participant 1: *"During the pandemic, I couldn't step out to earn a living. There was no transport, and I didn't have a two-wheeler or even know how to ride a bicycle. I was stuck at home, unable to even reach out to my friends."*

The participants described how they had to depend on the food ration that was distributed by some of the agencies like the government, NGOs, and other local bodies. They also described how financial support was meted out by some agencies, which could be availed of only by a few.

Participant 3: "*They were distributing kits in the towns, but many of us couldn't go to pick it because of lack of transportation. They distributed it in the town here but not for people living in the villages. Rice, oil, atta, sugar, dal and dry ration were distributed, but we couldn't avail it*."

Participant 5: "*It was a very tough period. We could not move out of the house and there was no way of earning money. The trust people who have taken the initiative for us tried to help us by providing dry ration, kits, emergency medicines and even gave us 2000/- twice. We couldn't take out 2 wheelers and couldn't travel outside the village for work or to meet our friends, it was very difficult for all of us. Police ask us where we are going etc, so we couldn't go out.*"

Participant 4: "*Some of the NGOs conducted meetings which we tried to attend. They used to distribute dry ration including rice, dal, oil, atta, etc. The positive network groups held meetings to distribute medical items, including condoms, gels etc*."

Participants described mental health challenges due to lockdown restrictions and the resultant social isolation, where they were unable to contact their intimate partners and peers.

Participant 4: *"We were not happy and many of our friends left to their villages making us lonely. Our only support thus became speaking on the mobiles but recharging that also was an issue."*

Participant 3: *"One of our peers passed away due to COVID. We didn't even know he had passed until much later. The rules of the time didn't allow too many people to be involved, which was very disheartening."*

Participants elucidated how the stringent lockdown measures cut them off from their chosen romantic partners (outside of their marriage) and how the inability to meet friends and peers caused extreme distress.

Participant 5: *"I was stuck at home and couldn't meet my boyfriend for almost the whole of the lockdown period. Having to constantly stay with my wife was very suffocating. I couldn't make calls because I live in a small house and there is no privacy"*

Participant 3: *"I have been forced into this marriage and have two children. I am not happy but have no other option. If anyone comes to know about my sexual orientation or my profession, it will be the end of my life. People will ostracize me and my family. Meeting and speaking with other friends like me [MSM] is the only relief I used to have but this lockdown cut me off from everyone."*

Participant 2*:" I belong to a very traditional society. Exposing my sexual preferences here would mean being judged, ridiculed and ostracized. It would be a punishment for me as well as my family members. That's why, when the Sex workers' NGO announced that they are distributing rations and even giving monetary help, I did not go to take it. In a society like ours, it is better to go hungry than be exposed as a male sex worker."*

Discussion

The above results reflect the various impacts of the COVID-19 pandemic on the male sex workers in the remote villages of Pondicherry, India, exacerbated by the underlying preexisting economic and social vulnerabilities faced by them. Participants explained that the stringent lockdown measures resulted in social isolation and the inability to work, which induced distress and insecurity in their lives. The lack of income and financial distress led to the inability to afford even the basic needs for the family.

It is seen that belonging to marginalized communities during emergencies, increases the severity of the effects multifold. In that scenario, the participants of this study, being marginalised on multiple levels–economic, social, and educational–experienced compounded effects of the lockdown. The sex workers related how, during the two phases of the COVID-19 lockdown, they experienced emotional distress due to their inability to reach out to their intimate partners and were afraid to step out of their residence not only due to the strict lockdown rules but also the higher risk of being exposed by the police. The lack of legal protection marginalized them further, making it difficult to report abuse or seek help.

The participants belonged to remote areas which increased their isolation and difficulty in gaining access to resources. Being geographically distant, with little access to transport, lowered their chances of seeking support from other organizations and restricted access to clients. This automatically resulted in a drastic reduction of income, leading to financial instability and severe food insecurity. Being in this economically vulnerable situation placed the MSWs at risk of lowered negotiating power with clients, in terms of money as well as safe sex.

The analysis of the interviews reflects that the distress levels increased when the resources of individuals depleted, impairing their coping abilities. The travel restrictions did go a long way to curtail and prevent further transmission of COVID-19, but the economic shocks experienced by the marginalized sectors were severe.

There is notably scarce research available examining the impact of COVID-19 on Male sex workers in India. Current studies mainly address issues faced by female sex workers or transgender sex workers while concerns of male sex workers are multifold and warrant a dedicated approach. Studies among female, male and transgender sex workers found that

the pandemic and the extended lockdowns led to an inability to access clients due to a lack of public transportation, resulting in a steep fall in income and drastic lifestyle changes, and leading to distress. While this largely holds true in the case of male sex workers, the specificities of their preexisting vulnerabilities mark a stark difference in their response to these stressors. One of the participants explained how he couldn't visit the NGO (working for sex workers) distributing food items, since it would have exposed him as a sex worker. The societal norms and taboos in India, where the preconceived notions about masculinity and heteronormative culture are fixed in the minds of people, identifying oneself openly as a male sex worker would be devastating.

Conclusions and Implications

This study revealed several interesting findings. Notably, the issues faced by male sex workers were similar to those of the general population, but the negative impacts were exacerbated due to the multifold preexisting vulnerabilities.

The crisis of the lockdown brought to the fore many aspects of the lives of male sex workers, the most important of them being the internalized homonegativity (internalization of society's negative attitudes towards same sex sexuality), shame, and fear of social stigma. The participants termed the fear of being ostracized by family and society as one of the main reasons for living hidden and secret lives, causing extreme psychological and emotional stress.

The study's findings serve as a basis for further policy recommendations to address the specific issues of recognition and legal regulations. Addressing heteronormative bias requires an approach involving recognising assumptions about sexuality and orientation, fostering open dialogue, community sensitisation and education, training, and promoting inclusive policies.

The study further focuses on the importance of empowering the MSWs through initiating alternative sources of income, skill development, education, and initiatives to promote digital technology and literacy. Identifying the unique needs of this marginalized group and implementing targeted interventions will support the well-being and resilience of the male sex workers during crises situations or in their daily lives.

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