

ORIGINAL RESEARCH PAPER

Urban management and sustainable business by entrepreneurs

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ABSTRACT

BACKGROUND AND OBJECTIVES: *The nation's urban sector has experienced significant changes since industrialization, both in terms of growth and improvement in terms of creating jobs and the depletion of natural resources. The development and destruction are commendable and need mention and attention. These days, issues such as environmental degradation, the wealth gap, and unequal access to opportunities and resources are increasing. These concerns have increased the need for urban management through sustainable and planned development. The development cannot be sustained unless the depletion is controlled and taken care of. The current study focused on how urban regions have changed and how sustainable development helps cope with the changes. Furthermore, the study focused on enhancing the well-being of urban communities and promoting inclusivity to develop sustainable businesses that are economically sustainable in the long run. The novelty of the study is that explores how sustainable development can mitigate the impacts of urban change and enhance community well-being and inclusivity. **METHODS:** *Quantitative methodologies, such as surveys and statistical analyses, may have shed light on the broader impact of sustainable business practices on urban development. To complement these findings, qualitative case studies and interviews could have fostered deeper insights into specific initiatives and the perspectives of entrepreneurs navigating this landscape. A mixed-methods approach, weaving together quantitative trends with rich qualitative narratives, would have further enriched the understanding of motivations and challenges encountered. Ultimately, regardless of the specific methodologies employed, this research likely aimed to achieve a holistic understanding of the intricate connections between urban management, sustainable business practices, and the innovative spirit of entrepreneurs driving change in India. In this study, the researcher used regression analysis and factor analysis to achieve the research objectives.

FINDINGS: The entrepreneurs examined in the study exhibited a proactive stance towards critical aspects of sustainable business, notably waste management, energy efficiency, and resource optimization. The study identifies significant associations between key variables and sustainable urban development. Urban management demonstrates a positive impact ($B = 1.286$, $SE = 0.621$, $Beta = 0.116$, $T = 2.071$, $P = 0.0039$), highlighting its crucial role in shaping sustainable practices. Sustainable practices, in turn, exhibit a strong positive correlation ($B = 1.088$, $SE = 0.257$, $Beta = 0.238$, $T = 4.242$, $P = 0.0001$), indicating their pivotal role in driving urban development towards sustainability. These findings underscore the importance of integrating effective urban management strategies and sustainable practices to foster inclusive and resilient urban communities.

CONCLUSION: The findings provide the government with all the criteria essential for a valid approach to the sustainable development of the urban regions of the country and provide the appropriate balance between growth and development. The researcher recommended that creating supportive policies and incentives, investing in green infrastructure, supporting local entrepreneurship ecosystems, collecting and sharing data, and promoting community engagement are requirements for urban management. In addition, recommended that focusing on triple bottom line impact, collaborating with other stakeholders, Innovating and adapting, communicating transparently, and advocating for change are required for Sustainable Businesses by Entrepreneurs.

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INTRODUCTION

Entrepreneurship has been viewed as an impetus assistant acting in the direction of uplifting the economy by developing new firms and industries encountering several hurdles and ultimately surfacing generating several jobs. While on the other side entrepreneurship would include multiple aspects by taking up the reachable inputs and generating the sustainable output needed (Noor et al., 2021). Sustainable development in India has continued to be a much-rationalized affair not just among governments but even amongst the student community. In light of the rationale of urban management and enhancement, sustainable development stands as the primary facet for the success of the project. The committee that the government established for this project took into mind the fact that as the population of nations like India grows, so does the corresponding need for resources (Mougeot, 2006). Regardless of the profitable upliftment happening worldwide, there has been a simultaneous growth in financial, societal, and environmental pitfalls. Natural coffers' reduction and the detrimental impact of environmental decline, comprising of a few extreme deficiencies such as unavailability of ample amounts of fresh drinking water (Samimi and Moghadam, 2024), loss of biodiversity, and draught, are some of the highlighted and brought to notice critical issues that need immediate attention for sustenance and survival (Greco, 2017). The term, sustainable refers to enhancing the current scenario for an even more developed foreseeable future. This has become even more vital in the context of the urban arena to deploy more environment-friendly protocols that would end up in more practical monetary situations workable for the individuals of the urban sector. The target of the government is to revamp around 100 cities into smart cities all over the nation which would be sustainable in the coming future as well-being civilian amicable in the current reference. This project is an initiative in the direction of paving the path for India, which is to be recognized among the developed nationals in the world. The primary etiquette created by the central and state governments is to attain the target of uplifting the urban section of the nation by allotting the required monetary aid for core support and other requirements. A part of the output of the project was expected to be met by 2022, but now the

vision can be expected to come to form by 2030 (Rai et al., 2020). Randhawa and Kumar (2017) studied the features that the incremental level of population, resulting in an increased range of pollution due to misuse of natural resources, has contaminated the environment at large. Government representatives should focus on the sustainable urbanization of metropolises. India has outgrown the rapid-fire urbanization developing nation where the government has initiated a smart megacity charge. The standard of smart megacities in India is been well explained in this study. The results of Randhawa and Kumar (2017) concluded that in India the development of the smart megacity is with the integration of Information communication technology with civic planning to attain quality of life. Several micro, small, and medium-sized enterprises (MSMEs) fail to provide importance to sustainability (Rudawska, 2019), and environmental deterioration is not a primary concern for various business managers (Haanaes et al., 2011). For example, the global textile industry recycles only 1% of its total production waste, resulting in losses totaling \$1 billion annually. Generating sustainable quick fixes to environmental issues can provide entrepreneurial hopes across all industries (Schaltegger and Wagner 2011). For initial adopters, sustainability is a strategic driver that requires a top-down approach and has a positive impact on key stakeholders (Haanaes et al., 2011). Sustainability-oriented companies maintain a network of mutually beneficial relationships with stakeholders, and building such collaborative partnerships has a longer-term potential than operating solely on profit maximization principles (Viswanathan et al., 2007). Sustainability-oriented business processes connect a company's daily operations with social, economic, and environmental priorities and influence stakeholder management (Stolze et al., 2012). Companies that want to build sustainable production and consumption systems practice stakeholder management at multiple levels, such as individual, corporate, industry, and society (Gonzalez-Porras et al., 2021). Adams et al., (2016) mentioned that a sustainability-pushed invention technique involves enhancing merchandise, tactics, or practices to attain the particular cause of generating and figuring out social and environmental costs similar to monetary returns. Companies prioritize stakeholder relationships based on converting

collaboration dynamics, which affect their stakeholder engagement through the years, and they try to satisfy the expectations of their key stakeholders (Kujala *et al.*, 2019). The social element of sustainability additionally consists of building social networks (Dempsey *et al.*, 2011), and marketers create a complicated net of relationships to assist their sustainability ventures (Neumeyer and Santos 2018). Sustainable businesses flourish in the fertile ground of smart cities, fostering economic sustainability through cutting-edge technologies and innovative solutions (Cheraghipoor *et al.*, 2024). This combination highlights how important technology is to create smart cities, which are all-encompassing settings that are made to be open, automated, inclusive, scalable, safe, flexible, and simple to maintain. The winds of sustainable business model innovation sweep across organizations, bringing with them the power to transform. This creative force can breathe life into entirely new models, revitalize established ones, or even weave together different models into a cohesive tapestry. A redefined value proposition for customers, nestled within a fresh value framework that fuels the organization's journey towards sustainability. As technology accelerates and communities embrace its potential, entrepreneurial ecosystems within smart cities are buzzing with novel business models nurtured by these advancements (Khademi *et al.*, 2014). This trend of digitizing businesses serves as a powerful tool for innovation, potentially leading to a wave of positive impacts. Imagine a landscape where businesses leverage cutting-edge technology to offer personalized, efficient, and sustainable solutions tailored to the unique needs of smart city residents. This vision paves the way for exciting possibilities, but it's crucial to remember that responsible development and inclusive access are key to ensuring these benefits reach all corners of the community. Far from mere economic models, these innovative business structures wield the power to become decision-making engines and economic planning tools for smart city management. They empower urban authorities to navigate the complexities of their cities, optimizing their services to strike a delicate balance: economic viability, social inclusivity, and environmental sustainability. Imagine leveraging data-driven insights to tailor public transportation based on real-time demand, maximizing efficiency

while ensuring equitable access for all. This is the transformative potential that new business models unlock for smart cities. The United Nations 2030 proposal and the Sustainable Development Goals (SDGs) aims and supportability research is presently getting increasing consideration from the logical, political, and neighborhood decision-making organizations, which illustrates the need for organizations to rethink urban necessities to arrange to include social and natural issues that influence society as an entirety under consideration (Wolifson and Drozdzewski 2017; Mu *et al.*, 2022). Urban entrepreneurship, which is regularly connected to urban revitalization of the economy, society, and environment, plays a progressively critical part in cities where it empowers the advancement of neighborhood businesses and social systems by capturing unmistakable and intangible assets and drawing speculation and individuals to places. In arrange to form extra esteem, unused urban strategies therefore receive a technique that's centered on business enterprise and neighborhood systems (Franco and Rodrigues 2022; Hashmi *et al.*, 2023). Cities worldwide seek to become more astute as a portion of their key and inventive urban plans based on tending to existing urban issues and dangers (Chong *et al.*, 2018). Various studies and research have inspected the association between urban enterprise and supportability, with empirical proofs, and found that businesses affect maintainability (Azmat 2013; Dana *et al.*, 2022; Youssef *et al.*, 2018). Also, a couple of have been conducted to uncover the relationship between open administration and maintainability. Outstanding among these ponders are Pinz *et al.*, (2018) and Bessant *et al.*, (2015) who found that open administration activities profoundly impact supportability motivation, be that as it may, there exists a crevice in writing on the nexus of urban business, open administration and supportability in a single ponder (Begum *et al.*, 2022; Fu *et al.*, 2023; Hashmi *et al.*, 2023). Due to the large concentration of individuals in urban zones, people who act entrepreneurial in such ranges can be called urban entrepreneurs (Ziyae *et al.*, 2021). Subsequently, the business incorporates the exercises of the people related to making unused organizations (Gërguri-Rashiti 2017). The urban business enterprise gives a prolific ground for understanding unemployment and its issues for cities. Hence, later talks of financial

geology have progressively centered on urban imagination and the significance of imagination in accomplishing financial development (Yu *et al.*, 2020; Crittenden *et al.*, 2019). In Smart cities, expanding financial development and social improvement are sought after through mechanical advancement (Sarma and Sunny 2017) and with the steady alteration in innovation and society, savvy cities offer thoughts for urban development and future advancement ways (Jiang *et al.*, 2020). In connection with the shrewd city, businesses must alter the way values are made, displayed and ingested in natural, social and financial points of view. In this way, support in economic improvement forms can move forward commerce execution and make shared-value concepts (Morioka *et al.*, 2022). In arrange to move towards a maintainable trade show, imaginative exercises are basic to making economic values (Goni *et al.*, 2021). The current study focused on how urban regions have changed and how sustainable development helps cope with the changes. Furthermore, the study focused on enhancing the well-being of urban communities and promoting inclusivity to develop sustainable businesses that are economically sustainable in the long run. In comparison to previous studies of Brown and McGranahan (2016), this study aims to provide a more comprehensive understanding of urban challenges and proposes innovative solutions by synthesizing and building upon existing knowledge. This study was conducted during the academic year 2023-24 at Presidency Business School, Presidency College (Autonomous), Bangalore, Karnataka, in India.

Contextual background of the study

Urban areas in India are witnessing exponential growth, fueled by factors such as rural-urban migration, population expansion, and economic opportunities. This urban expansion has led to increased pressure on natural resources, infrastructure, and public services, posing significant challenges for sustainable urban development. Issues such as air and water pollution, inadequate waste management, and limited access to basic amenities underscore the urgent need for holistic urban management strategies.

Research gap and objectives

Despite the growing recognition of the importance of entrepreneurship in urban development, there exists a significant gap in the literature regarding the intersection of urban management, entrepreneurship, and sustainable development in India. This study seeks to bridge this gap by providing a comprehensive understanding of urban challenges and proposing innovative solutions to promote sustainable urban development. Specifically, the objectives of the study are to:

1. Explore the evolving dynamics of urban regions in India and the challenges they face in the context of sustainable development.
2. Examine the role of entrepreneurship in addressing urban challenges and fostering sustainable business practices within urban environments.
3. Identify innovative strategies and best practices for integrating entrepreneurship into urban management frameworks to promote sustainable urban development.
4. Assess the potential impact of these strategies on enhancing the well-being of urban communities and promoting inclusivity in urban development initiatives.

Hypothesis

Hypothesis 1: Effective urban management strategies have a positive impact on shaping sustainable practices within urban environments, and verify whether there is any significant relationship between urban management and sustainable practices in urban environments.

Hypothesis 2: Sustainable practices play a pivotal role in driving urban development toward sustainability, and verify whether there is any significant relationship between sustainable practices and urban development towards sustainability.

Significance of the study

This study holds significant implications for policymakers, urban planners, entrepreneurs, and other stakeholders involved in urban development initiatives in India. By shedding light on the role of entrepreneurship in promoting sustainable urban development, the findings of this study will inform policy decisions, guide urban planning strategies, and inspire innovative solutions to address pressing urban

challenges. Ultimately, the study aims to contribute to the advancement of knowledge in the field of urban management and entrepreneurship, with a focus on fostering inclusive and sustainable urban development in India.

MATERIALS AND METHODS

Study area

The study's main focus was on sustainable urban management techniques in a few Indian metropolises. The area made up of a densely populated urban agglomeration and its environs that share infrastructure, commercial spaces, transportation hubs, industrial zones, and residential regions is known as a metropolitan city. The chosen cities provide a mix of dry and wet tropical weather due to their diverse geographic location, with a humid tropical climate found in the northern regions. The chosen study area is located north of the equator and spans latitudes 8°4' to 37°6' north and longitudes 68°7' to 97°25' east (Fig. 1). Metropolitan cities have larger and more diverse populations than smaller cities or rural areas. This can make them more generalizable to other large cities, and it can also allow

researchers to study a wider range of phenomena. Amritsar, Delhi, Agra, Varanasi, Kolkata, Udaipur, Jaisalmer, Jaipur, Mumbai, Pune, Hyderabad, Panaji, Mysore, Chennai, Bangalore, Kochi, and Madurai were the Indian cities chosen for the study.

Survey design and data collection

In the Indian context, unraveling the intricate link between urban management and sustainable business ventures by entrepreneurs necessitates a judicious blend of quantitative and qualitative research tools. The cornerstone of this investigative endeavor lies in well-crafted surveys, strategically designed to encompass distinct sections capturing comprehensive insights into entrepreneur profiles, their adopted sustainable practices, perceptions of urban management support, and encountered challenges or opportunities. The inclusion of diverse question types such as multiple-choice, Likert scales, ranking, and open-ended prompts ensures the collection of both numerical and textual data, thereby weaving a rich tapestry of nuanced insights. To augment this primary data, secondary sources in the form of government reports, policy documents,

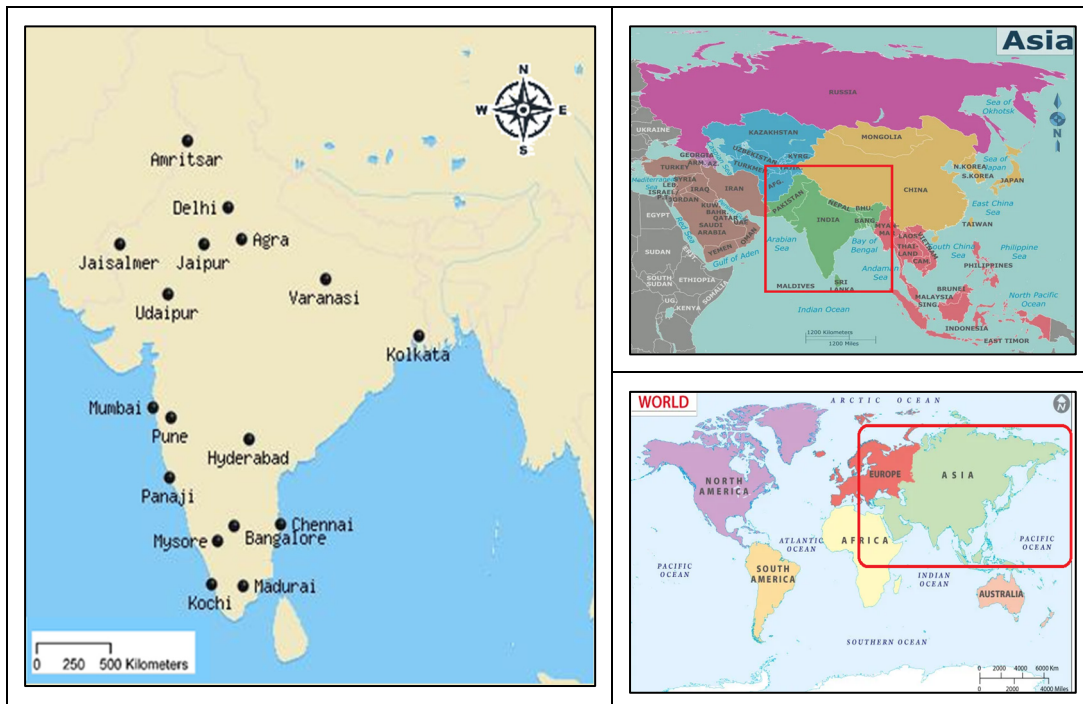


Fig. 1: Geographic location of the study area: India's metropolitan cities

and statistical resources on urban management and sustainable business practices provide a broader contextual understanding.

Entrepreneurs

Various diverse questions for entrepreneurs are

- Multiple Choice: Which sustainable practices do you currently implement in your business? (a) Waste reduction (b) Renewable energy (c) Water conservation (d) All of the above.
- Likert Scale: To what extent does your city’s urban management support sustainable businesses? (Strongly disagree and strongly agree)
- Open-Ended: What are the most significant challenges you face in integrating sustainability into your business model?
- Rank/Rate: Rank the following factors in terms of their importance for encouraging sustainable businesses in your city: (1 - Most important, 5 - Least important) (a) Financial incentives (b) Regulatory support (c) Technical assistance (d) Public awareness campaigns

Urban management officials

Various diverse questions for urban management officials are

- Multiple Choice: What types of policies or initiatives does your city have in place to promote sustainable business practices? (a) Green building codes (b) Waste management programs (c) Tax breaks for sustainable businesses (d) All of the above.
- Open-Ended: How do you collaborate with entrepreneurs to implement sustainable urban development initiatives?
- Rank/Rate: Rank the following challenges in preventing effective support for sustainable businesses in your city: (1 - Most challenging, 5 - Least

challenging) (a) Limited budget (b) Lack of awareness among entrepreneurs (c) Difficulty enforcing regulations (d) Insufficient data on sustainability impacts

Analytical framework

The analytical approach is two-pronged: quantitative data undergoes statistical methods like regression analysis to unveil relationships between variables, while qualitative data undergoes thematic analysis to identify central themes and recurring patterns in interview transcripts and observation notes. Throughout this empirical exploration, ethical considerations, including informed consent, data confidentiality, and strict adherence to research guidelines, remain paramount. The survey instrument undergoes a rigorous pilot test, the sources are triangulated for corroboration, and a reflective stance is maintained on potential biases and limitations of the study. By wielding these materials and methods with precision, the ensuing empirical study promises to illuminate the critical interplay between urban management and the burgeoning ecosystem of sustainable entrepreneurship in India. The use of statistical software, specifically SPSS, adds rigor to the quantitative data analysis process, further ensuring the reliability and validity of the findings.

RESULTS AND DISCUSSION

Statement on urban management

Table 1 shows the mean, Standard Deviation (SD), and priority ranking for the Statements on Urban Management. “I trust my city’s government to effectively manage public resources” got first rank with a mean value of 5.04. “I feel like I have a voice in shaping the future of my city” got second rank with a mean value of 4.99. “My city is well-equipped to

Table 1: Statements on urban management

Statements	Mean	SD*	Priority ranking
I trust my city's government to effectively manage public resources	5.04	1.523	1
My city is well-equipped to handle unexpected challenges like natural disasters or pandemics	4.96	1.547	3
My city prioritizes environmental sustainability in its urban planning	3.61	1.977	6
My city offers residents easy access to recycling and waste disposal options	3.29	1.188	7
The availability of parks and green spaces in my city contributes positively to my mental and physical well-being	4.48	1.693	5
My city government effectively communicates with residents about important decisions	4.87	1.488	4
I feel like I have a voice in shaping the future of my city	4.99	1.380	2

*SD: Standard deviation

handle unexpected challenges like natural disasters or pandemics” got the third rank with a mean value of 4.96. “My city government effectively communicates with residents about important decisions” got the fourth rank with a mean value of 4.87. “The availability of parks and green spaces in my city contributes positively to my mental and physical well-being” got fifth rank with a mean value of 4.48. “My city prioritizes environmental sustainability in its urban planning” got the sixth rank with a mean value of 3.61 and “My city offers residents easy access to recycling and waste disposal options” got the seventh rank with a mean value of 3.29.

Urban management factors

Urban management is an intricate field that takes many different aspects and factors into account. Urban planning, mobility and transit, housing, public health, social service, economic development, and community involvement are all included in urban management. For this study, some criteria are explained as follows.

Factor 1: Trust in government and crisis management

High positive loadings for statements about trusting the city government and its ability to handle unexpected challenges. Indicates a factor related to public trust in government and confidence in crisis management capabilities.

Factor 2: Green urban planning and communication

Positive loadings for statements related to environmental sustainability, green spaces, and effective communication with residents. Suggests a factor associated with urban planning that prioritizes sustainability and transparent communication.

Factor 3: Resident engagement and voice

Positive loadings for statements reflecting resident engagement and having a voice in shaping the future of the city. Indicates a factor related to citizen involvement and participation in urban decision-making.

Factor 4: Parks and well-being

Positive loadings for statements linking parks and green spaces to residents’ well-being. Suggests a factor related to the positive impact of accessible parks and green areas on mental and physical well-being.

Factor 5: Miscellaneous governance aspects

Mixed loadings on various statements suggest a more diverse factor related to other aspects of urban governance.

Urban management is a multifaceted approach to efficiently plan, organize, and control the complexities associated with urban areas to ensure sustainable development and the well-being of residents. It involves the coordination of various sectors, such as land use, transportation, infrastructure, and environmental sustainability. The management of urban areas requires a comprehensive understanding of the dynamic interactions among social, economic, and environmental factors. Previous researchers have employed diverse methods and techniques, including quantitative analyses, case studies, and modeling, to explore urban management challenges and solutions, according to [Robinson et al., \(2011\)](#). These studies have delved into topics such as smart city technologies, participatory planning, and resilient urban development. The insights gained from this research contribute valuable knowledge to urban policymakers and practitioners, aiding in the formulation of effective strategies for urban governance. What sets this study apart is its emphasis on a holistic and integrative approach to urban management, acknowledging the interconnectedness of various urban systems.

Statement on sustainable practices by entrepreneurs

[Table 2](#) shows the mean, SD, and priority ranking for the sustainable practices by entrepreneurs. “The upfront costs of implementing sustainable practices can be a barrier for small businesses” got first rank with a mean value of 5.10. “Educating customers about the value of sustainable products and services can be challenging” got second rank with a mean value of 5.08. “My business actively reduces its energy consumption and uses renewable energy sources whenever possible” got the third rank with a mean value of 4.98. “I believe that building a sustainable business is essential for long-term success” got fourth rank with a mean value of 4.87. “We minimize waste generation and prioritize recycling and composting within our operations” got fifth rank with a mean value of 4.31 and “Collaboration with other sustainable businesses can provide valuable resources and support” got sixth rank with a mean value of 4.23.”

Table 2: Statements on sustainable practices by entrepreneurs

Statements	Mean	SD	Priority Ranking
I believe that building a sustainable business is essential for long-term success	4.87	1.789	4
My business actively reduces its energy consumption and uses renewable energy sources whenever possible	4.98	1.603	3
We minimize waste generation and prioritize recycling and composting within our operations	4.31	1.564	5
Educating customers about the value of sustainable products and services can be challenging	5.08	1.698	2
The upfront costs of implementing sustainable practices can be a barrier for small businesses	5.10	1.694	1
Collaboration with other sustainable businesses can provide valuable resources and support	4.23	1.813	6

Sustainable practices factors

By incorporating sustainable practices into their business models and operations and encouraging a culture of sustainability throughout their organizations, entrepreneurs have a special potential to drive sustainability. Following are the explanations of several criteria for this study.

Factor 1: General support for sustainable business

High positive loadings for beliefs in the essential nature of sustainable business for long-term success. Indicates a factor related to the overall support and belief in the importance of sustainability for business success.

Factor 2: Energy efficiency and renewable sources

High positive loadings for statements related to reducing energy consumption and using renewable energy sources in business operations. Suggests a factor associated with sustainable energy practices within businesses.

Factor 3: Waste minimization and recycling

Positive loadings for minimizing waste generation and prioritizing recycling and composting. Indicates a factor related to sustainable waste management practices within business operations.

Factor 4: Customer education and challenges

High positive loadings for statements about educating customers on sustainable products and the challenges associated with them. Suggests a factor related to the difficulties and importance of educating customers about sustainability in products and services.

Factor 5: Barriers and collaboration

Mixed loadings on statements about barriers to sustainable practices and collaboration with other sustainable businesses. Indicates a more diverse factor related to challenges and opportunities in sustainable business practices.

Sustainable practices encompass a range of strategies aimed at meeting the needs of the present without compromising the ability of future generations to meet their own needs. Previous studies have examined various sustainable practices across different sectors, including energy, agriculture, transportation, and construction. These studies have highlighted the importance of reducing carbon emissions, promoting renewable energy sources, adopting eco-friendly agricultural methods, and implementing green building technologies. In comparison to earlier research, the present study builds upon these findings by emphasizing a more integrated and cross-sector approach to sustainability. The results of the current study reveal that a comprehensive and interconnected strategy is crucial for achieving sustainable outcomes. By synthesizing insights from previous studies and proposing a more holistic perspective, this research contributes to a more nuanced understanding of sustainable practices and offers a roadmap for a more effective and harmonized implementation of sustainable strategies across diverse sectors. This approach addresses the interconnected nature of sustainability challenges and underscores the need for collaborative efforts to foster a resilient and environmentally friendly future.

Regression analysis between urban management and sustainable business by entrepreneurs

Regression analysis is a useful tool for

Table 3: Regression analysis between urban management and sustainable business by entrepreneurs

Variables	B	SE	Beta	T	P
Urban management	1.286	0.621	0.116	2.071	0.0039
Sustainable practices	1.088	0.257	0.238	4.242	0.0001

comprehending and controlling the intricate dynamics of urbanization. Making better decisions on urban development and management can be aided by its insightful information about the relationships between various elements. Regression analysis can be used, from the perspective of urban management, to forecast the increase of the urban population based on variables such as past population statistics, economic growth, and urban development strategies. This can assist legislators and urban planners in making well-informed choices about housing, infrastructure development, and other urban services. Planning and development plans for land use can be optimized with the aid of regression analysis. Regression analysis is a useful tool for evaluating how different urban policies and interventions affect outcomes like economic development, crime rates, and air quality. Regression analysis can also be used to predict the growth of the urban economy based on variables like investment trends, income levels, and employment rates. One useful technique for entrepreneurs looking to create long-lasting companies is regression analysis. Entrepreneurs may estimate future performance and determine the critical aspects that go into measuring the impact of sustainability initiatives by employing regression analysis. Additionally, entrepreneurs can recognize and comprehend the essential elements that support sustainability and profitability by employing regression analysis. Regression analysis can be used to determine which elements have the biggest effects on the performance of the business to improve resource allocation. Regression analysis can be used to pinpoint areas that need improvement by figuring out what exactly is hurting the company's performance. In this study, the regression analysis has been performed between urban management and sustainable business by entrepreneurs, and the results are presented in Table 3.

The first row of Table 3 shows the results for the independent variable "urban management". The coefficient of the urban management variable is 1.286, and the p-value is 0.039. This means that the urban management variable is statistically significant at the

0.05 level. The fact that the coefficient of the urban management variable is positive means that there is a positive relationship between urban management and the dependent variable. In other words, as urban management increases, the dependent variable also increases. The second row of Table 3 shows the results for the independent variable "Sustainable practices". The coefficient of the sustainable practice variable is 1.088, and the p-value is 0.0001. This means that the sustainable practices variable is statistically significant at the 0.05 level. The fact that the coefficient of the sustainable practices variable is positive means that there is a positive relationship between sustainable practices and the dependent variable. Regression analysis Standard Error (SE) provides information about the overall fit of the regression model, the width of confidence intervals, statistical significance, and accuracy of coefficient estimations. It is an essential tool for analyzing regression analysis data and drawing defensible conclusions from it. The study's urban management and sustainable practices were determined to have standard errors of 0.621, and 0.257, respectively (Table 3). The sustainable methods had the least amount of standard error, followed by urban management. For sustainable practices, a smaller standard error denotes a more accurate estimate of the coefficient, higher statistical significance, a narrower confidence interval, better model fit, and more testing power for hypotheses. In regression analysis, a smaller standard error is often preferred as it denotes a more accurate and dependable assessment of the relationship between the variables. Regression analysis was performed to make a model to foresee the relationship between urban management and sustainable business by entrepreneurs and the results are presented in Table 4. The accompanying Regression model was viewed as affirming the connection between Independent and dependent variables (Samimi and Nouri, 2023).

The percentage of the dependent variable's variation that can be predicted from the independent variables is shown by the coefficient of determination (R^2), in regression analysis (Samimi and Mansouri,

Table 4: R and R² value between urban management and sustainable business by entrepreneurs

R	R ²	F	p
0.899	0.808	11.910	0.0001

2024). From Table 4, it may be observed that the value of R² (0.808) shows the change of the dependent variable being clarified by the independent factors and the worth of F (11.910) displays the significant relationship. The worth of F static affirms the wellness of the model. The R value (0.899) represents a solid connection between the independent and dependent factors. The R² also represents the autonomous factors like urban management and sustainable practices collected for the model together. The correlation coefficient (R) is 0.899, which indicates a strong positive correlation between the two variables. Even though the coefficient of determination is 0.808, the other variable accounts for 80.8% of the variance in the main variable. The study found a limited correlation between sustainable entrepreneurs and urban management, as indicated by the low value of R². The results of this research indicated that, given the low R², it could be necessary to speculate on whether any other variables should be taken into account when analyzing the relationship between sustainable practices and urban management. However, the connection is statistically significant as indicated by the F-statistic of 11.910, which is significant at the p-value of 0.0001.

Vari max rotated component matrix between urban management and sustainable business by entrepreneurs

By maximizing the variance of the squared loadings inside a factor, the Varimax rotation seeks to simplify factor interpretation and facilitate the identification of the main variables connected to each component between urban management and sustainable business entrepreneurs. This can be especially helpful in urban management when determining the major elements influencing quality of life, sustainability, or urban development. Understanding the fundamental elements that affect other facets of urban management, such as infrastructure, transportation, economic development, and environmental quality, can also be aided by this. Additionally, the Vari Max Rotated Component Matrix (VMRCM) is a tool that aids in the identification and

interpretation of the underlying elements influencing urban management by academics and urban planners. This information can be used to design policies and make decisions that are more effectively informed. For sustainable business shareholders, the Vari Max Rotated Component Matrix can be a useful tool for determining the fundamental elements that support sustainability and company success, assessing the success of sustainability programs, and spotting areas where their sustainability efforts can be strengthened. Through the examination of the rotational component matrix, entrepreneurs can determine which variables are not influencing the elements crucial for sustainable business practices and prosperity, offering them valuable perspectives on places in which to concentrate on their efforts to enhance sustainability. Data often contains underlying factors that influence multiple variables. These factors might represent broader concepts or latent constructs that aren't directly measured. Factor analysis helps us identify these hidden factors by statistically examining the correlations or inter-relationships between the observed variables. Table 5 displays the results of a Vari Max rotation applied to a factor analysis of different variables. By analyzing the loadings (values between -1 and 1), the study can identify underlying themes or factors that explain the relationships between the original variables. Table 5 shows the loadings of variables on extracted factors after Varimax rotation. Rotated Components for the Urban Management (RCUM) of various factors are designated as RCUM1, RCUM2, RCUM3, RCUM4, RCUM5, RCUM6, and RCUM7 for the urban statements 1, 2, 3, 4, 5, 6, and 7, respectively. Similarly, Rotated Components for the Sustainable Practices (RCSP) of various factors are designated as RCSP1, RCSP2, RCSP3, RCSP4, RCSP5, and RCSP6 for the sustainable practice statements 1, 2, 3, 4, 5, and 6, respectively. Vari max rotated component matrix between urban management and sustainable business by entrepreneurs is presented in Table 5.

From Table 5, it may be observed that RCUM1 was strongly correlated to "I trust my city's government to effectively manage public resources" of the urban

Table 5: Vari max rotated component matrix between urban management and sustainable business by entrepreneurs

Factors	1	2	3	4	5
Urban management					
I trust my city's government to effectively manage public resources	0.945	-0.110	0.059	-0.028	-0.037
My city is well-equipped to handle unexpected challenges like natural disasters or pandemics	0.884	-0.110	0.059	-0.028	-0.037
My city prioritizes environmental sustainability in its urban planning	0.815	-0.107	-0.284	-0.172	0.210
My city offers residents easy access to recycling and waste disposal options	0.739	0.905	-0.101	-0.033	-0.175
The availability of parks and green spaces in my city contributes positively to my mental and physical well-being	0.600	0.905	-0.101	-0.033	-0.175
My city government effectively communicates with residents about important decisions	0.538	-0.447	-0.204	-0.140	-0.187
I feel like I have a voice in shaping the future of my city	0.514	-0.433	0.221	0.268	0.305
Sustainable practices					
I believe that building a sustainable business is essential for long-term success	0.133	0.7617	0.924	-0.075	0.043
My business actively reduces its energy consumption and uses renewable energy sources whenever possible	0.133	0.6854	0.924	-0.075	0.043
We minimize waste generation and prioritize recycling and composting within our operations	-0.412	0.6665	0.502	-0.052	-0.119
Educating customers about the value of sustainable products and services can be challenging	-0.018	0.6417	-0.079	0.952	-0.086
The upfront costs of implementing sustainable practices can be a barrier for small businesses	-0.018	0.6215	-0.079	0.952	-0.086
Collaboration with other sustainable businesses can provide valuable resources and support	0.173	0.6121	0.007	0.470	0.129

management statement. RCUM1 was moderately correlated to urban statements 2, 3, and 4. Less was correlated to 5, 6, and 7 of the urban management statements. RCUM2 was strongly contributed by urban statements 4 and 5, which may be related to “my city offers residents easy access to recycling and waste disposal options” and “the availability of parks and green spaces in my city contributes positively to my mental and physical well-being”. RCUM3, RCUM4, and RCUM5 did not influence any of the statements mentioned for urban sustainability management. But, moderately correlated with the urban management statement, “I feel like I have a voice in shaping the future of my city”. Furthermore, from Table 5, it may also be observed that RCSP2 had a positive correlation with sustainable practices from 1 to 6, and RCSP2 was strongly correlated with the sustainable practice statement “I believe that building a sustainable business is essential for long-term success”. The RCSP2 was moderately correlated

with other sustainable practices, from 2 to 6. Whereas, all other factors (RCSP1, RCSP3, RCSP4, and RCSP5) were less correlated with all statements of sustainable practices. The overall observations made from Table 5 indicated that RCUM1 and RCSP2 were from strongly to moderately, correlated with the overall statement of both urban management and sustainable practices.

RECOMMENDATIONS

The study made some recommendations on sustainable practices for sustainability as well as urban management based on its findings.

For urban management:

Urban management in the context of sustainable business by entrepreneurs can be defined as the set of strategies, policies, and actions aimed at effectively planning, organizing, and governing urban resources and activities to promote economic development,

social equity, and environmental sustainability within urban areas. It involves coordinating various stakeholders, including entrepreneurs, local government, and communities, to achieve sustainable urban development goals.

- Encouraging green infrastructure development: Promoting the use of renewable energy sources, implementing green building practices, and creating green spaces within urban areas to enhance environmental sustainability and support sustainable businesses.

- Facilitating collaboration and networking: Fostering partnerships between entrepreneurs, local government, academic institutions, and community organizations to share resources, knowledge, and best practices for sustainable business development.

- Implementing supportive policies and incentives: Introducing policies that incentivize sustainable business practices, such as tax breaks for eco-friendly businesses or subsidies for renewable energy initiatives, to encourage entrepreneurship and innovation in sustainability.

- Promoting technology adoption: Encouraging the adoption of innovative technologies, such as IoT devices for energy management or blockchain for supply chain transparency, to improve efficiency and reduce environmental impact in urban businesses.

- Support local entrepreneurship ecosystems: Invest in incubators, accelerators, and mentorship programs tailored to sustainable businesses. Facilitate access to funding, co-working spaces, and networking opportunities.

- Collect and share data: Track the impact of sustainable businesses on economic, social, and environmental indicators. Share data publicly to inform policy decisions and attract further investment.

- Promote community engagement: Encourage dialogue between residents, businesses, and local government to identify shared sustainability goals and develop inclusive solutions.

For sustainable businesses by entrepreneurs:

- Focus on triple bottom line impact: Measure and report on economic, social, and environmental performance. Prioritize practices that benefit community well-being, such as fair wages, local sourcing, and inclusive hiring.

- Collaborate with other stakeholders: Partner with local non-profits, government agencies, and

academic institutions to leverage expertise and resources. Explore collective efforts like shared supply chains or joint marketing initiatives.

- Innovate and adapt: Continuously seek new technologies and business models that enhance sustainability and address community needs. Embrace experimentation and pilot projects to learn and evolve.

- Communicate transparently: Share your sustainability values and impact stories with stakeholders. Foster understanding and trust through engaging communication channels.

- Advocate for change: Participate in policy discussions and support organizations working towards a more sustainable future. Raise awareness about the positive role of sustainable businesses in urban communities.

Addressing the Role of Local Government and Policymakers:

- Creating a conducive regulatory environment: Developing policies and regulations that support sustainable business practices, streamline permitting processes for eco-friendly businesses, and ensure compliance with environmental standards.

- Providing financial support and resources: Offering grants, loans, or subsidies to entrepreneurs for implementing sustainable business initiatives, conducting research and development in sustainable technologies, or participating in training and capacity-building programs.

- Facilitating access to markets and networks: Facilitating access to local and global markets, providing networking opportunities with potential partners and investors, and promoting collaboration between sustainable businesses and other stakeholders in the urban ecosystem.

While Indian cities face challenges in achieving sustainability, "Urban Management and Sustainable Business by Entrepreneurs" shines a light on the potential of entrepreneurial solutions. The study concludes that harnessing the power of innovative businesses, coupled with supportive government policies and collaborative efforts, can unlock a brighter future for urban India. Entrepreneurs, armed with diverse business models like circular economy ventures and resource-efficient technologies, are key players in tackling environmental and social challenges. However, their success hinges on a supportive

ecosystem. Clear, long-term government policies that incentivize sustainability and streamline regulations are vital. Collaboration between entrepreneurs, NGOs, and government agencies unlocks knowledge, resources, and best practices for broader impact. Living in densely populated urban centers sparks a unique brand of entrepreneurial spirit, giving rise to the distinct phenomenon of "urban entrepreneurs" (Ziyae *et al.*, 2021). By harnessing the city's inherent dynamism and resource diversity, these enterprising individuals offer innovative solutions that not only tackle urban unemployment but also fuel economic growth. This growing trend has captivated the attention of economic geographers, who highlight the crucial role of urban creativity in unlocking a city's economic potential (Yu *et al.*, 2020; Crittenden *et al.*, 2019). The rise of digital technologies has become a potent force in reshaping urban governance. Transforming cities into data-driven landscapes fuels not only the optimization of governance processes but also contributes to capital accumulation for further urban development. However, this burgeoning trend towards smart cities, heavily reliant on technological solutions, services, and infrastructure, risks reinforcing a singular ideology that can potentially narrow the scope of urban decision-making, potentially leading to homogenized outcomes across diverse urban contexts (Ziyae *et al.*, 2021). Equally important is ensuring inclusivity and equity. Sustainable initiatives must empower marginalized communities, providing equitable access to resources and benefits. Standardized metrics and participatory planning processes further strengthen the impact of these initiatives. By empowering entrepreneurs, fostering innovative business models, and ensuring effective urban management, the study paves the way for a future where Indian cities thrive – environmentally responsible, socially just, and economically vibrant. The journey towards this vision requires continued research and active collaboration, but the potential rewards are immense. Let's embrace the power of entrepreneurship and chart a sustainable course for India's urban future. The findings underscore the critical role that entrepreneurs play in shaping urban landscapes and fostering sustainability. Firstly, it is evident that successful urban management and sustainable business practices are intertwined, with entrepreneurs serving as key actors in driving positive change. The study reveals a growing awareness

among Indian entrepreneurs regarding the importance of integrating sustainable practices into their business models. This shift is not only driven by ethical considerations but also by a recognition of the long-term economic benefits associated with environmentally responsible practices. Additionally, the study highlights the challenges faced by entrepreneurs in navigating the complex landscape of urban development policies and regulations. There is a need for greater collaboration between entrepreneurs and government bodies to create an enabling environment that supports sustainable business practices. Overall, the empirical evidence suggests that a holistic and collaborative approach involving entrepreneurs, policymakers, and other stakeholders is essential for fostering urban sustainability in the Indian context. This research contributes to the ongoing discourse on sustainable business and urban management, providing practical insights that can inform both policy and entrepreneurial decision-making for a more sustainable and resilient future.

CONCLUSION

The empirical study on urban management and sustainable business by entrepreneurs in the Indian context yields valuable insights into the intersection of economic development, environmental considerations, and entrepreneurial endeavors. The findings underscore entrepreneurs' proactive adoption of sustainable practices, focusing on waste management, energy efficiency, and social responsibility. This highlights innovation's crucial role in fostering balanced urban growth and development through holistic approaches beyond profit. The novelty of the study lies in its exploration of how sustainable development can mitigate the impacts of urban change and enhance community well-being and inclusivity. By shedding light on the proactive stance of entrepreneurs towards sustainable business practices and their critical role in shaping urban landscapes, the study contributes to the ongoing discourse on sustainable business and urban management. The significance and value of the study are twofold. Firstly, it emphasizes the importance of integrating sustainable practices into entrepreneurial endeavors, not only driven by ethical considerations but also recognizing the long-term economic benefits. Secondly, the study highlights the need for greater collaboration between entrepreneurs and

government bodies to create an enabling environment that supports sustainable business practices. These insights have practical implications for policymakers, entrepreneurs, and other stakeholders, informing decision-making processes for a more sustainable and resilient urban future in India.

AUTHORS CONTRIBUTION

K. Ravindran handled the literature review, analysis, and interpretation of the data. The review was revised and written under the supervision of C.A. Chandan and offered expertise and insights into the research design and methodology. D. Sivakumar provided insightful commentary to ensure the manuscript's technical soundness. A.S.B. Inayath collected the data and finished writing portions of the text. T. Dhanabalan conducted statistical analysis of the collected data, applying appropriate methods to analyze relationships between variables. Both the literature review and a portion of the manuscript preparation were done in part by V. Kumaresan.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancy, were observed by the authors.

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ABBREVIATIONS	DEFINITION
%	Percent
MSME	Micro, Small, and Medium-sized Enterprises
RCSP	Rotated Components for Sustainable Practices
RCUM	Rotated Components for Urban Management
SDG	Sustainable Development Goals
SD	Standard Deviation
SE	Standard Error
VMRCM	Vari Max Rotated Component Matrix

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