Smart Cities and Informal Livelihoods: A Comparative Study of Vendor Outcomes Across Tamil Nadu Cities

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***Abstract*—The Smart City Mission, launched by the Government of India in 2015, represents a transformative initiative aimed at urban renewal and sustainable development across 100 cities. This study examines the impact of the Smart City Mission on vendors in Salem City, Tamil Nadu, focusing on economic growth, job creation, inclusivity, diversity, and technological adaptation. Using empirical analysis and field survey methods with 45 respondents from three key locations—Old Bus Stand, Thirumanimutharu Nalangadi, and V.O.C Market—the study employs correlation and simple percentage analysis. The findings reveal significant positive impacts, including increased revenue for 82.22% of vendors, infrastructure improvements for 68.89%, and employment generation for 55.56%. However, challenges persist, including limited awareness (42.22%) and funding disparities. The study concludes that while the Smart City Mission has fostered notable advancements, policymakers must address inclusivity concerns to ensure sustainable and equitable urban development.**

***Index Terms*—Smart City Mission, Vendors, Economic Growth, Inclusivity, Technological Adaptation, Salem City**

I. THE SETTING

The 21st century is unequivocally the urban century. A profound demographic shift is underway, with the global population rapidly concentrating in cities. From less than 5% in the 18th century, today more than 57% of humanity resides in urban areas, a figure projected to surpass 80% by the end of this century[1]. This transition, driven by the pursuit of economic opportunity and a better quality of life, presents both immense opportunities and daunting challenges. While urbanization can be a powerful engine for economic growth and a key strategy for reducing per-capita energy consumption and CO2 emissions[2], it also strains existing infrastructure, exacerbates social inequalities, and demands new, integrated approaches to planning, governance, and service delivery.

In response to these complex urban challenges, the concept of the "Smart City" has emerged as a dominant paradigm. A Smart City is broadly defined as a municipality that leverages information and communication technologies [3] to enhance operational efficiency, share information with the public, and improve the quality of government services and citizen welfare [4]. However, its true value lies not in the technology itself, but in how that technology is applied to optimize city functions, drive economic growth, and improve the quality of life for its citizens. The success of a smart city hinges on a strong collaborative relationship between the government, the private sector, and the citizenry, as the creation and maintenance of a data-driven environment often occurs outside the public sector. The characteristics that define a city's "smartness" are multifaceted, encompassing a technology-based infrastructure, environmental initiatives, a high-functioning public transportation system, and a strong sense of urban planning that enables its citizens to live, work, and utilize resources effectively [5].

Globally, numerous cities have embarked on their smart city journeys, each with a unique focus. Barcelona, Spain, has gained recognition for its

[1] World Bank

[2] Owen, 2009
[3] ICT
[4] IBM, 2009
[5] Owen, 2009

holistic approach, implementing a broad spectrum of initiatives from smart traffic lights and open data platforms to a city operating system (OS) that integrates sensor data [6]. Singapore stands out for its strong technological backbone and ambitious targets in smart energy, mobility, and healthcare [7]. Rio de Janeiro has focused on improving its transportation systems and providing digital literacy training in underserved communities[8] . These diverse global implementations underscore that there is no single template for a smart city; rather, it is a dynamic concept evolving with geopolitical contexts and ongoing research.

India, with its rapidly growing urban population (currently 31% contributing 63% to the GDP), launched its own ambitious 100 Smart Cities Mission on June 25, 2015 [9]. This urban renewal and retrofitting program, led by the Ministry of Urban Development, aims to create citizen-friendly and sustainable cities that provide core infrastructure, a decent quality of life, and a clean environment through the application of "smart solutions." The mission's strategy is built on area-based development—which includes retrofitting, redevelopment, and greenfield projects—complemented by pan-city initiatives that apply smart solutions to city-wide infrastructure. With an allocated budget of Rs. 48,000 crores from the central government, matched by state and local bodies, the mission represents a significant investment in India's urban future[10].

While the Smart Cities Mission in India has generated substantial academic and policy interest, much of the existing literature has focused on macro-level outcomes such as economic growth, governance structures, and technological integration. Studies have highlighted the importance of data-driven approaches for monitoring urban development (Batalha, 2014), the potential of smart city applications for enhancing sustainability (Kritikos, 2014), and the need for holistic frameworks that encompass social, environmental, and economic factors (Anthopoulos, 2015). Other research has delved into the role of information technology in job creation (Chege & Wang, 2020), the importance of SMEs as engines of economic growth (Gherghina et al., 2020), and the critical role of effective governance in the successful implementation of smart city initiatives (Meijer & Bolívar, 2016).

However, a significant gap exists in the literature concerning the ground-level, micro-economic impacts of these large-scale urban transformations. Specifically, there is a dearth of empirical research examining how smart city initiatives affect the informal sector and small-scale entrepreneurs, who form the backbone of urban economies. Vendors, who operate in markets, bus stands, and street corners, are integral to the urban fabric, providing essential goods and services, creating employment, and contributing to the city's vibrant character. As smart city projects reshape physical infrastructure, introduce digital systems, and alter urban flows, the livelihoods of these vendors are inevitably impacted. Questions arise about their access to new markets, their ability to adapt to technological shifts, their inclusion in the benefits of development, and the challenges they face in an increasingly digitized and formalized urban environment. As noted by scholars, the process of technological adaptation is often discontinuous (Tyre & Orlikowski, 2011) and can be influenced by the non-economic goals of business owners (Lin & Zhu, 2019), adding layers of complexity to how vendors might respond to smart city interventions.

The state of Tamil Nadu, one of the early adopters of the Smart Cities Mission, provides a compelling context for this inquiry. With 11 cities selected under the mission, including Salem, the state has seen significant investment in urban infrastructure, with projects spanning roads, public transportation, and e-governance systems, implemented by the Tamil Nadu Urban Development and Infrastructure Development Corporation. Salem, the fifth-largest city in the state, is a notable case. Its smart city vision focuses on transforming its Central Business District a 690-acre area encompassing the Old Bus Stand, V.O.C. Market, and the Thirumanimutharu River channel into a vibrant commercial hub using ICT-based

[6] Intelligent Community Forum, 2015
[7] Frost & Sullivan
[8] Intelligent Community Forum, 2015
[9] Census 2011
[10] Ministry of Finance, GoI

solutions and transit-oriented development[11]. The establishment of a state-of-the-art Integrated Command and Control Centre (ICCC) further underscores the city's commitment to a data-driven governance model. These planned interventions, while promising for overall urban efficiency, are poised to directly alter the operational landscape for the vendors concentrated in these very areas.

This study, therefore, addresses this critical gap by investigating the impact of the Smart City Mission on vendors in Salem City. Drawing on empirical analysis and a field survey of 45 vendors in key locations such as the Old Bus Stand, V.O.C. Market, and Thirumanimutharu Nalangadi, this research seeks to understand the multifaceted effects of these urban renewal projects. The core objectives of this research are threefold: first, to study the economic growth and job creation experienced by vendors; second, to analyze the inclusivity and diversity of the mission's impact on this group; and third, to examine the role of vendors in technological and innovation adaptation within the evolving smart city framework.

The statement of the problem is clear as Salem embarks on its journey to become a smart city, there is an urgent need to understand how these initiatives are influencing local vendors. The promise of improved infrastructure and connectivity must be weighed against potential disruptions to traditional marketplaces, shifts in competition, and changes in livelihoods. By identifying the opportunities and challenges faced by these vendors, this research aims to provide crucial insights for policymakers, urban planners, and the vendors themselves. Ultimately, this study seeks to ensure that the transition to a smart city in Salem is not only efficient and technologically advanced but is also inclusive, equitable, and beneficial for all stakeholders, particularly those who form the vibrant commercial heart of the city. The significance of this research lies in its potential to illuminate the human and economic dimensions of smart city development, offering lessons that can guide more inclusive urban policies in Salem and beyond.

[11] Ministry of Housing & Urban Affairs

II. REVIEW OF LITERATURE

2.1 Technological Adaptation and Innovation

Tyre and Orlikowski (2011) argue that technological adaptation is discontinuous, occurring through episodic modifications triggered by discrepant events or new discoveries. This finding underscores the importance of considering temporal aspects of technology implementation for vendors. Sun et al. (2021) highlight the role of technological innovation and knowledge spillover in improving energy efficiency, suggesting that vendors play a crucial role in facilitating the adoption of innovative solutions. Chege and Wang (2020) investigate information technology innovation's role in job creation by SMEs in developing countries, finding that technology innovations positively influence employment creation and act as a driving force for economic development.

2.2 Economic Growth and Job Creation

Kritikos (2014) emphasizes entrepreneurs' significant impact on job creation and economic growth, noting that entrepreneurial activities contribute substantially to urban development. Gherghina et al. (2020) highlight SMEs as the engine of economic growth through investments and innovation. Karadag (2016) emphasizes SMEs' and entrepreneurship's role in driving economic growth in emerging economies, finding that economic growth and SME sector development are closely linked in both developed and developing economies. Bulavskaya and Reynès (2018) explore job creation and economic impact of renewable energy, finding that the transition to renewable energy can create approximately 50,000 new jobs by 2030.

2.3 Inclusivity and Diversity

Ormiston et al. (2015) highlight impact investing's importance in promoting social and economic inclusion within cities. Sorkness et al. (2017) emphasize mentorship and support networks' role in fostering inclusivity in research and professional careers. Jacobs et al. (2019) emphasize the importance of mission statements regarding social inclusion in smart city contexts. Moreno et al. (2021) introduced the "15-Minute City" concept emphasizing sustainability, resilience, and place identity, highlighting inclusive and diverse urban spaces' importance.

2.4 Smart City Governance and Frameworks

Meijer and Bolívar (2016) conducted a comprehensive review of smart urban governance literature, highlighting governance structures' importance in successful smart city implementation. Anthopoulos, Janssen, and Weerakkody (2016) proposed a Unified Smart City Model (USCM) for conceptualizing and benchmarking smart cities. Giourka et al. (2019) developed the Smart City Business Model Canvas, providing a practical framework for understanding smart city business models.

III. OBJECTIVES OF THE STUDY

- To study the economic growth and job creation of vendors in Salem city
- To analyze vendor inclusivity and diversity
- To examine vendors' role in technological and innovation adaptation

3.1 Research Design

The study employed empirical analysis and field survey methods, utilizing a systematic interview schedule for data collection through personal interview techniques.

3.2 Sampling Method and Sample Size

Random sampling was employed to select 45 respondents from three locations:

- Old Bus Stand: 15 respondents (33.33%)
- Thirumanimutharu Nalangadi: 15 respondents (33.33%)
- V.O.C Market: 15 respondents (33.33%)

3.3 Data Collection

Primary Data: Collected through structured questionnaires comprising both close-ended and open-ended questions

Secondary Data: Sourced from Wikipedia, Smartcities.gov.in, IBEF, MoHUA, and other official sources

3.4 Statistical Tools

Data was analyzed using correlation analysis and simple Percent methods.

IV. ANALYSIS AND FINDINGS

4.1 Demographic Profile of the Respondents

Table 4.1: Demographic Characteristics

Variables	Category	Percent (%)
Gender	Male	66.67
	Female	33.33
Age Group	20–30 years	8.89
	31–40 years	33.33
	41–50 years	46.67
	51 years and above	11.11
Family Type	Nuclear	86.67
	Joint	13.33
Housing Status	Own	75.56
	Tenant	24.44
Religion	Hindu	82.22
	Christian	6.67
	Muslim	11.11
Community	SC	11.11
	ST	2.22
	MBC	55.56
	BC	31.11
Marital Status	Married	84.44
	Unmarried	13.33
	Separated	2.22

Source: Primary Data

The demographic profile indicates that the respondent base is predominantly male (66.67%) and middle-aged, with nearly half (46.67%) falling in the 41–50 age group. This suggests that street vending and related informal activities are largely sustained by experienced, economically active individuals rather than younger entrants.

The dominance of nuclear families (86.67%) and high levels of home ownership (75.56%) indicate relative residential stability among respondents. Social composition is skewed towards MBC (55.56%) and BC (31.11%) communities, reflecting the typical socio-economic structure of informal sector participants in Tamil Nadu.

A high proportion of married respondents (84.44%) further suggest that these economic activities are central to household livelihood security.

Table 4.2: Economic Outcomes

Variables	Category	Percent (%)
Monthly Income	Below ₹50,000	55.56
	₹50,001–70,000	35.56
	₹70,001–90,000	8.89
Changes in Revenue	Increased	82.22
	Decreased	13.33
	No Change	4.44
Business Expansion	Yes	66.67
	No	24.44
	Planning	8.89
Employment Generation	Yes	55.56
	No	44.44

Source: Primary Data

The findings reveal a mixed but generally positive economic impact. While a majority of respondents (55.56%) remain in the lower income bracket (below ₹50,000), a significant proportion reported increased revenue (82.22%), suggesting that the Smart City Mission has contributed to improved business activity.

The fact that 66.67% expanded their businesses and 55.56% generated employment indicates that benefits extend beyond individual vendors to broader local economic development.

However, the persistence of low income levels despite revenue growth hints at structural constraints, such as rising costs, informal competition, or limited scalability of vending activities.

Table 4.3: Infrastructure and Technological Changes

Variables	Category	Percent (%)
Infrastructure Improvement	Yes	68.89
	No	31.11
Sanitation Improvement	Yes	77.78
	No	22.22
Technology Influence	Significant	51.11
	Moderate	40.00
	No	8.89
	Change	
Budget for Innovation	Significant	33.33
	Moderate	31.11
	Minimal	22.22
	None	13.33

A majority of respondents perceive substantial improvements in infrastructure (68.89%) and sanitation (77.78%), indicating that urban interventions have enhanced the working environment for vendors.

Technology adoption appears to be moderately strong, with over 90% reporting at least some improvement in customer engagement. However, investment patterns show that only one-third allocate significant budgets for innovation, reflecting financial limitations and risk aversion in the informal sector.

This suggests that while infrastructure improvements are externally driven, technology adoption remains uneven and resource-dependent.

Table 4.4: Awareness and Participation

Variables	Category	Percent (%)
Awareness of Smart City Mission	Yes	75.56
	No	24.44
Participation Level	Active	42.22
	Partial	55.56
	None	2.22

Although awareness levels are relatively high (75.56%), active participation is comparatively lower (42.22%), with the majority engaging only partially.This gap indicates that information dissemination alone does not translate into full inclusion, possibly due to administrative barriers, lack of institutional support, or limited access to formal participation channels.

Table 4.5: Inclusivity Outcomes and Challenges

Positive Impacts

Indicator	Percent (%)
Support for women entrepreneurs	51.11
Minority business opportunities	26.67
Accessibility for differently-abled	22.22

Challenges

Issue	Percent (%)
Limited awareness/outreach	42.22
Lack of targeted programs	33.33
Discrimination	22.22

The Smart City Mission demonstrates moderate inclusivity, particularly in supporting women-owned enterprises (51.11%). However, benefits for minorities and differently-abled groups remain limited.

The presence of challenges such as low outreach (42.22%) and lack of targeted interventions (33.33%) indicates that inclusivity is not systematically institutionalized, but rather incidental.

Table 4.6: Correlation Matrix

Variables	Pearson's r	p-value	Significance
New Customers & Employment	0.021	0.894	Not Significant
New Customers & Technology	0.086	0.580	Not Significant
New Customers & Training	-0.064	0.679	Not Significant
New Customers & Income	-0.506	<0.001	Significant
Employment & Technology	0.137	0.374	Not Significant
Employment & Training	-0.079	0.612	Not Significant
Employment & Income	-0.198	0.198	Not Significant
Technology & Training	0.037	0.809	Not Significant
Technology & Income	0.044	0.775	Not Significant
Training & Income	0.290	0.056	Marginal

The correlation analysis reveals a notable and statistically significant negative relationship between *new customer acquisition and income* ($r = -0.506$, $p < 0.001$). This counterintuitive finding suggests that increasing customer numbers does not necessarily translate into higher income.

A plausible explanation is that vendors may be reducing prices, operating in highly competitive environments, or serving low-value transactions, thereby increasing volume without proportional income gains.

All other relationships are statistically insignificant, indicating that key variables such as technology adoption, training support, and employment generation do not have a strong measurable association with income changes in this context.

The weak and marginal relationship between training and income ($p \approx 0.056$) suggests potential benefits, but not at a statistically robust level.

V. DISCUSSION

The finding that 82.22% of vendors experienced increased revenue following Smart City Mission implementation aligns with Gherghina et al. (2020), who identified SMEs as engines of economic growth through investments and innovation. However, the significant negative correlation between new customer acquisition and income suggests that increased footfall alone does not guarantee improved financial outcomes—a finding that warrants further investigation into pricing dynamics, operational costs, and competitive pressures.

The gender distribution (66.67% male, 33.33% female) reveals persistent disparities in vendor representation, consistent with Sorkness et al. (2017)'s emphasis on mentorship and support networks for fostering inclusivity. The finding that 51.11% of respondents acknowledged support for women-owned enterprises suggests progress, yet the 33.33% representation gap indicates room for improvement. The predominance of vendors from Most Backward Classes (55.56%) reflects the mission's reach into marginalized communities, though the 2.22% representation of Scheduled Tribes raises concerns about equitable distribution.

Chege and Wang (2020) found that technology innovations positively influence employment creation in small businesses. This study's finding that 51.11% of vendors reported significant improvement in customer satisfaction due to technological advancements corroborates this. However, the correlation analysis's non-significant relationship between technological adaptation and income generation ($r = 0.044$, $p = 0.775$) suggests that technology adoption alone does not guarantee

economic benefits—effective integration and complementary capabilities are essential.

Meijer and Bolívar (2016) emphasized effective collaboration between government, private sector, and citizens for successful smart city implementation. This study's finding that 55.56% of vendors reported partial participation, coupled with 42.22% citing limited awareness as a primary challenge, suggests that governance mechanisms require strengthening to ensure comprehensive stakeholder engagement.

VI. SUGGESTIONS AND RECOMMENDATIONS

- Develop targeted communication strategies to reach vendors lacking awareness about Smart City initiatives (42.22% cited this as a primary challenge)
- Review budget allocation mechanisms to ensure equitable distribution, noting that 22.22% received minimal funding and 13.33% received no allocation for innovation
- Include established local vendors in procurement contracts to ensure continuity and support traditional businesses during urban transformation
- Incorporate ATMs, drinking water facilities, and internet access in vendor areas to enhance business viability and customer experience
- Leverage digital payment systems, online marketing, and e-commerce platforms to expand customer reach beyond physical locations
- Participate in available training programs to enhance technological literacy and business management capabilities

VII. CONCLUSION

The Smart City Mission in Salem City has brought about transformative changes for vendors, with notable positive impacts on revenue (82.22% increase), infrastructure (68.89% improvement), and employment generation (55.56%). However, the mission's implementation has also presented challenges, including funding disparities, limited awareness, and persistent inclusivity gaps.

The significant negative correlation between new customer acquisition and income suggests that the relationship between smart city interventions and vendor outcomes is more complex than initially hypothesized. While infrastructure improvements and technological advancements have enhanced operational efficiency, translating these gains into sustainable economic benefits requires addressing underlying structural factors, including pricing mechanisms, competitive dynamics, and capacity-building needs.The mission's success ultimately depends on its ability to balance technological advancement with social inclusion. As Salem continues its smart city journey, policymakers must prioritize mechanisms that ensure all vendors—regardless of gender, community background, or business size—can participate in and benefit from urban transformation. By addressing identified challenges and leveraging the mission's demonstrated strengths, Salem can serve as a model for inclusive, sustainable smart city development across India.

VIII. LIMITATIONS

1. Sample size of 45 respondents limits generalize ability to Salem's broader vendor population
2. Cross-sectional design captures perceptions at a single time point, unable to track longitudinal changes
3. Geographic focus limited to three locations may not represent vendors across all Salem smart city zones

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