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Lifestyle Patterns of the General Public and Utilization of Smart City Facilities

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ABSTRACT - Smart city initiatives aim to enhance urban living by integrating technology with sustainable development; however, their success largely depends on public lifestyle patterns and usage behavior. This study examines the lifestyle patterns of the general public and their utilization of smart city facilities in Coimbatore city. Primary data were collected from 665 respondents through a structured interview schedule using a convenience sampling method. The study employs percentage analysis and weighted average ranking to assess preferences related to transportation, energy usage, water conservation, waste management, and environmental practices. The findings reveal that respondents strongly prefer simple and cost-effective practices such as using public transportation, walking or cycling for short distances, sharing rides, and adopting basic energy-saving measures. In contrast, technology-intensive practices like gamified conservation applications, IoT-enabled systems, and electric vehicles show lower adoption. The study highlights the influence of socio-economic factors on lifestyle choices and emphasizes the need for improved awareness, incentives, and citizen engagement to enhance effective utilization of smart city facilities.

Keywords: Smart City Facilities, Lifestyle Patterns, Sustainable Urban Living, Public Participation, Weighted Average Ranking

INTRODUCTION AND BACKGROUND

Urbanization and technological advancement have significantly reshaped the way people live, work, and interact with their urban environment. In response to growing challenges such as traffic congestion, energy shortages, water scarcity, environmental degradation, and population pressure, the concept of smart cities has emerged as a comprehensive approach to sustainable urban development. Smart cities integrate digital technologies, intelligent infrastructure, and data-driven governance to improve service delivery, enhance environmental sustainability, and raise the overall quality of life of citizens. However, the success of smart city initiatives depends not only on infrastructure development but also on the lifestyle patterns and daily practices of the general public. Lifestyle patterns reflect individuals' choices related to transportation, energy usage, water consumption, waste management, and environmental responsibility. In a smart city context, these patterns include the adoption of public transportation, carpooling, cycling, the use of electric or hybrid vehicles, and walking or biking for short distances. Similarly, energy-related behaviors such as switching to LED lamps, using energy-efficient devices, unplugging idle electronics, relying on solar energy, and reducing excessive use of air conditioners demonstrate how citizens interact with smart energy systems. The incorporation of smart technologies such as IoT-enabled water tanks, motion-sensor lights, AI-based leak detection systems, and gamified conservation applications further illustrates the evolving relationship between technology and lifestyle.

Water and waste management practices are equally important components of smart city living. Practices such as rainwater harvesting, greywater recycling, proper water segregation, closed-loop water systems, banning open burning, recycling programs, and the use of vacuum street sweepers indicate the level of public engagement with sustainable urban systems. In addition, lifestyle choices influenced by family structure and residential location-urban or semi-urban-play a vital role in determining access to and utilization of smart facilities. Households that promote reusable products, biodegradable materials, eco-friendly packaging, and environmental awareness contribute directly to the sustainability goals of smart cities.

In developing countries like India, smart city missions emphasize citizen-centric development, where behavioral change and public participation are considered as important as technological deployment. Despite the availability of smart facilities, variations in awareness, attitude, and adoption persist across occupational groups and residential areas. Therefore, analyzing lifestyle patterns through a structured questionnaire and weighted average ranking method provides meaningful insights into how effectively smart city facilities are being utilized. Understanding these patterns is essential for aligning smart city infrastructure with public behavior, ensuring sustainable urban growth, and maximizing the long-term impact of smart city initiatives.

STATEMENT OF THE PROBLEM

Smart city initiatives aim to improve urban living through advanced technologies and sustainable infrastructure. However, the effective utilization of these smart city facilities by the general public remains uneven. Although facilities such as smart transportation systems, energy-efficient devices, renewable energy solutions, water conservation technologies, and waste management mechanisms are available, many people continue to follow conventional lifestyle practices. The adoption of smart lifestyle behaviors varies across individuals due to differences in occupation type, residential location (urban or semi-urban), and family structure. In many cases, limited awareness, lack of motivation, and resistance to behavioral change reduce public participation in smart city programs. As a result, a gap exists between the availability of smart infrastructure and its actual use in daily life. Without understanding how lifestyle patterns influence the utilization of smart city facilities, policymakers and planners may not achieve the desired sustainability outcomes. Therefore, this study addresses the need to analyze public lifestyle patterns to assess their role in utilizing smart city facilities effectively.

SCOPE OF THE STUDY

The scope of the study is confined to examining the lifestyle patterns of the general public and their utilization of smart city facilities. The study focuses on key lifestyle dimensions such as transportation choices, energy consumption practices, water conservation behaviors, waste management habits, and environmental sustainability initiatives. It analyzes how factors such as occupation type, residential location (urban and semi-urban), and family structure influence the adoption and usage of smart city facilities. Data are collected using a structured questionnaire, and the weighted average ranking method is employed to identify the most and least preferred smart lifestyle practices. The study does not evaluate the technical efficiency of smart city infrastructure but concentrates on public behavior and usage patterns. The findings are expected to provide insights for policymakers, urban planners, and smart city administrators to improve citizen engagement, enhance awareness programs, and promote sustainable lifestyle practices within the smart city framework.

REVIEW IF LITERATURE

International research highlights that citizen happiness and meaningful public involvement are fundamental conditions for the sustainable success of modern smart city and urban development programmes worldwide. Van Twist, Ruijer, and Meijer (2023) distinguish between active discontent, where citizens openly oppose smart city technologies and governance processes, and passive discontent, where dissatisfaction remains hidden due to low awareness and limited channels for expression, indicating the need for responsive governance and better communication. Studies on Singapore's smart initiatives show that citizen trust depends strongly on transparent data governance, accountable institutions, and participatory mechanisms that protect personal data while ensuring open access to information. The Capgemini Research Institute reports that 58 percent of global citizens perceive smart cities as sustainable, yet 63 percent state that data privacy is more important than improved urban services, revealing a tension between technological benefits and privacy concerns.

Comparative work on Brazil, the United Kingdom, and the Netherlands demonstrates that citizen roles and reactions evolve under different urban governance models, ranging from contestation to acceptance and co-creation, rather than remaining static. Research on Smart Santander in Spain illustrates how large-scale sensor deployment and active communication of benefits can enhance public support, particularly for environmental quality and the city's image as an innovative urban brand. Silva and colleagues and similar reviews argue that many digital reporting and service platforms remain largely informational and do not fully embed deliberative, participatory tools for long-term citizen engagement in decision-making. Wirtz, Becker, and Schmidt (2022) find that citizens tend to prioritise smart services that provide immediate, tangible improvements, such as better transportation, digital administration, and social services, over more abstract or long-term digital innovations.

In response to these global trends, UN-Habitat has promoted people-centred smart city guidelines that emphasise

inclusion, human rights, and multi-level governance rather than purely technology-driven approaches. Studies of Hong Kong's smart city trajectory reveal that despite high technological capacity, persistent challenges in transparency, participation, and trust constrain public support, underscoring that advanced infrastructure alone is insufficient without strong participatory governance. Collectively, these studies suggest that smart technologies generate transformative value when combined with clear communication, robust data protection, inclusive participation, and trust-building governance frameworks.

OBJECTIVE OF THE STUDY

To identify the life style pattern of general public

SIGNIFICANCE OF THE STUDY

The study is significant as it provides valuable insights into the lifestyle patterns of the general public and their utilization of smart city facilities. By identifying preferred and least adopted lifestyle practices, the study helps understand the gap between smart city infrastructure availability and actual public usage. The findings assist policymakers and urban planners in designing citizen-centric strategies to promote sustainable behaviors related to transportation, energy conservation, water management, and waste reduction. The use of weighted average ranking highlights priority areas for intervention. Overall, the study contributes to improving public participation, enhancing smart city effectiveness, and supporting sustainable urban development initiatives.

RESEARCH METHODOLOGY

Source of Data

The present study is based entirely on primary data collected directly from the general public through a structured interview schedule. Interviews were adopted as the primary data collection method to obtain first-hand and reliable information on lifestyle patterns and the utilization of smart city facilities. The structured interview schedule ensured uniformity in questions posed to all respondents, thereby enabling consistency and comparability of responses. This approach enhanced the reliability and validity of the collected data and facilitated systematic analysis of public behavior toward smart city initiatives.

Sampling Technique and Sample Size

The study employed a convenience sampling technique to select respondents from Coimbatore city. A total of 665 respondents participated in the survey. Convenience sampling was chosen due to its practical feasibility and ease of access to respondents willing to participate in the study. However, it is acknowledged that this non-probability sampling method may limit the generalizability of the findings beyond the study area.

Framework of Analysis

The collected data were analyzed using both descriptive and inferential statistical tools. Percentage analysis was used to present the demographic profile of respondents and to summarize lifestyle and Weighted average ranking was applied to identify and rank key lifestyle practices influencing the utilization of smart city facilities.

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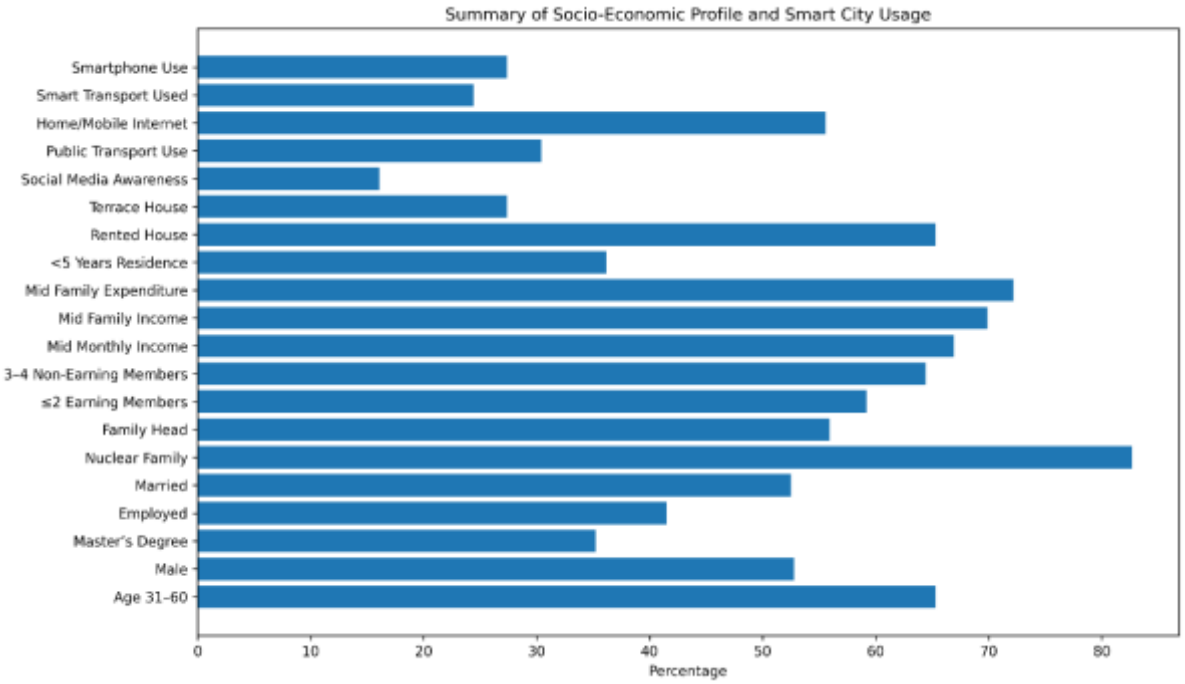
ANALYSIS AND INTERPRETATION



INTERPRETATION

The consolidated chart presents a comprehensive overview of the dominant socio-economic characteristics of the respondents. The majority of respondents belong to the economically active age group of 31–60 years, with a slight male predominance. A substantial proportion of respondents possess higher educational qualifications, particularly master's degrees, and are predominantly employed, indicating a relatively educated and working population. Most respondents are married, belong to nuclear families, and act as heads of their households, with up to two earning members and three to four non-earning members in the family. Income and expenditure patterns largely fall within the middle-income range, reflecting financial stability. A majority reside in rented and terrace houses and have lived in the city for less than five years. Social media emerges as a key source of smart city awareness, while public transportation is the most commonly used commuting mode. Internet access is mainly through home broadband and mobile devices, with smartphones being the most frequently used digital device, indicating readiness for smart city service adoption.

WEIGHTED AVERAGE RANKING – LIFE STYLE PATTERN OF GENERAL PUBLIC

S.No	Life Style	SA	A	N	DA	SDA	Total	Mean score	Rank
		5	4	3	2	1			
1	Walk or Bike for Short Distances	391	218	56	0	0	665	4.5038	**2**
		1955	872	168	0	0	2995		
2	Use reusable bags, bottles, and containers	296	265	104	0	0	665	4.2887	**3**
		1480	1060	312	0	0	2852		
3	Reusing of Waters	265	152	97	93	58	665	3.7113	**21**
		1325	608	291	186	58	2468		
4	Using energy efficient device	361	158	86	60	0	665	4.2331	**7**
		1805	632	258	120	0	2815		
5	Underground Reservoirs	66	186	283	130	0	665	3.2827	**27**
		330	744	849	260	0	2183		

6	Participate in local recycling programs.	270	177	150	68	0	665	3.9759	**12**
		1350	708	450	136	0	2644		
7	Air-Dry Clothes	210	252	162	41	0	665	3.9489	**13**
		1050	1008	486	82	0	2626		
8	Avoid burning waste	136	263	216	50	0	665	3.7293	**18**
		680	1052	648	100	0	2480		
9	Gamified Water Conservation Apps	138	60	42	152	273	665	2.4556	**36**
		690	240	126	304	273	1633		
10	Unplug Idle Devices	356	138	37	94	40	665	4.0165	**9**
		1780	552	111	188	40	2671		
11	Rainwater Harvesting	128	240	229	68	0	665	3.6436	**22**
		640	960	687	136	0	2423		
12	Avoid using of plastic	189	255	183	38	0	665	3.8947	**14**
		945	1020	549	76	0	2590		
13	Reduce Refrigerator Usage	0	80	187	182	216	665	2.1970	**37**
		0	320	561	364	216	1461		
14	Maintain a steady speed on vehicles	250	223	128	64	0	665	3.9910	**11**
		1250	892	384	128	0	2654		
15	Switch to Biofuels	0	176	332	157	0	665	3.0286	**33**
		0	704	996	314	0	2014		
16	Open curtains and blinds	49	157	256	154	49	665	3.0045	**34**
		245	628	768	308	49	1998		
17	Encouraging Biodegradable Materials	134	280	207	44	0	665	3.7579	**16**
		670	1120	621	88	0	2499		
18	Use Fans Instead of Air Conditioners	311	232	122	0	0	665	4.2842	**4**
		1555	928	366	0	0	2849		
19	Proper water segregation	134	258	227	46	0	665	3.7218	**20**
		670	1032	681	92	0	2475		
20	Ban Open Burning	96	178	211	124	56	665	3.2015	**30**
		480	712	633	248	56	2129		
21	Motion-sensor lights	170	326	169	0	0	665	4.0015	**10**
		850	1304	507	0	0	2661		
22	Smart tanks equipped with IoT devices	73	256	244	92	0	665	3.4662	**24**
		365	1024	732	184	0	2305		
23	Spreading environment Awareness	265	205	148	47	0	665	4.0346	**8**
		1325	820	444	94	0	2683		
24	Making use of LED lamps	347	193	78	47	0	665	4.2632	**6**
		1735	772	234	94	0	2835		
25	closed-loop water systems	54	207	275	129	0	665	3.2797	**28**
		270	828	825	258	0	2181		

26	Share rides with coworkers and friends	351 1755	182 728	93 279	39 78	0 0	665 2840	4.2707	**5**
27	Use vacuum street sweepers	185 925	165 660	99 297	78 156	138 138	665 2176	3.2722	**29**
28	Conserving natural resources	96 480	167 668	162 486	97 194	143 143	665 1971	2.9639	**35**
29	Opting Biodegradable packaging	119 595	297 1188	204 612	45 90	0 0	665 2485	3.7368	**17**
30	Promoting Eco friendly Products	72 360	180 720	242 726	126 252	45 45	665 2103	3.1624	**32**
31	Greywater Recycling	216 1080	136 544	129 387	140 280	44 44	665 2335	3.5113	**23**
32	Use public transportation, carpooling, or cycling	403 2015	209 836	53 159	0 0	0 0	665 3010	4.5263	**1**
33	Conservation of water	138 690	250 1000	235 705	42 84	0 0	665 2479	3.7278	**19**
34	Monitoring energy consumption	222 1110	174 696	178 534	91 182	0 0	665 2522	3.7925	**15**
35	Use sensors and AI to detect and fix leaks	46 230	219 876	289 867	111 222	0 0	665 2195	3.3008	**26**
36	Switch to electric or hybrid vehicles	127 635	221 884	119 357	51 102	147 147	665 2125	3.1955	**31**
37	Use Solar Energy	96 480	203 812	275 825	91 182	0 0	665 2299	3.4571	**25**

From the weighted Average Rank test, it is inferred that majority of the respondents prefer using public transportation, carpooling, or cycling, followed by walking or biking for short distances, use of reusable bags, and use of fans instead of air conditioners, while technology-driven practices like gamified water conservation apps and reducing refrigerator usage are least adopted.

SUGGESTIONS

- Sustainable mobility practices such as public transportation, cycling, and walking should be continuously promoted, as they are highly preferred by the general public.
- Awareness programs should emphasize simple and low-cost energy-saving practices like using fans instead of air conditioners, LED lamps, and unplugging idle devices.
- Public understanding of advanced smart technologies such as IoT-based water management systems and AI-enabled leak detection tools should be improved through targeted education.
- User-friendly and localized gamified water and energy conservation applications should be encouraged with suitable incentives to increase adoption.
- Financial support and subsidies should be provided to motivate households to adopt solar energy systems, electric or hybrid vehicles, and energy-efficient appliances.
- Citizen engagement should be strengthened through community-based recycling programs, social media outreach, and regular feedback mechanisms to improve smart city utilization.

CONCLUSION

The study concludes that lifestyle patterns of the general public play a vital role in the effective utilization of smart city facilities. The findings reveal that respondents show a strong preference for simple, cost-effective, and environmentally friendly practices such as using public transportation, walking or cycling for short distances, sharing rides, using reusable products, and adopting basic energy-saving measures. These practices require minimal technological intervention and align closely with daily routines, making them easier to adopt. Energy-efficient behaviors such as using LED lamps, fans instead of air conditioners, unplugging idle devices, and monitoring energy consumption also received positive responses, indicating a reasonable level of environmental awareness among the public.The study also highlights limited adoption of technology-intensive smart city solutions, including gamified water conservation applications, IoT-enabled water systems, advanced recycling technologies, and electric or hybrid vehicles. This suggests the presence of barriers such as lack of awareness, perceived complexity, cost concerns, and resistance to lifestyle change. Socio-economic factors such as occupation type, income level, residential status, and family structure further influence lifestyle choices and the utilization of smart facilities. The study emphasizes that the success of smart city initiatives depends not only on infrastructure development but also on citizen behavior and participation. Enhancing awareness, simplifying technology use, providing incentives, and strengthening public engagement are essential to ensure sustainable urban living and maximize the long-term impact of smart city development.

FUTURE SCOPE

The scope for future research can be extended by conducting comparative studies across multiple smart cities to understand regional variations in lifestyle patterns and smart city utilization. Longitudinal studies may be undertaken to examine changes in public behavior over time as smart technologies become more widespread. Future studies can also incorporate qualitative methods such as focus group discussions to gain deeper insights into barriers to adopting technology-driven smart city solutions. Additionally, the impact of policy interventions, incentive schemes, and digital literacy programs on lifestyle changes can be evaluated. Integrating advanced analytical models may further enhance understanding of citizen engagement in smart city development.

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