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# FROM MISSION TO MEANING: EVALUATING SMART CITY DEVELOPMENT IN ASSAM

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## 1. INTRODUCTION

Rapid urbanization has become one of the hallmark features of India's development trajectory in the twenty-first century. Cities are required to provide a boost to growth, foster innovation, and enable improved social conditions. Yet, the problem is that Indian cities remain seriously affected by a range of issues such as unorganized growth, overpopulation, and lack of infrastructure. As a solution, the Government of India has started the Smart Cities Mission, and the purpose of this is to enable a new age of inclusive and sustainable growth in the respective cities with the help of new technologies, new governance, and new public infrastructure.

The Smart Cities Mission eliminates the need to focus on a standardized approach and instead considers area-based development, digital governance, smart transportation, enhanced urban services, and people centric plans to improve the overall quality of life in a smart city. The Smart Cities Mission selects Guwahati as the only city in the state of Assam owing to its prime location as the entrance to the Northeast region of the country and increasing prominence as a hub for the economy and education. The smart city projects in Guwahati are designed to provide efficient solutions to the problems associated with traffic congestion, flooding, inefficient public services, and governance in the city.

While policies and investments are crucial for the implementation of a smart city, it ultimately depends on how it is received by the residents of a particular city. Citizen awareness, acceptance, and participation can play a very crucial role in whether a smart city implementation helps integrate proper development within citizens' lives. A specific category of stakeholders includes students, who play a very crucial role because they are involved in either using or accessing transportation, technology, education, and other services, putting them in direct contact with smart services. Their perception gives valuable insights as it represents overall sentiments about effective service delivery, transparent governance, and overall improvement in their lifestyle. Therefore, in this respect, the current study aims to analyze the overall development of smart cities in Guwahati by considering awareness, advantages, challenges, and overall adaptability of students towards smart cities. Therefore, through these perception studies, there would be clarity about how effectively the Smart Cities Mission in Guwahati has gone beyond just having intentions.

## 2. LITERATURE REVIEW

***International***

Alizadeh et al., (2023) examined temporary "demonstration projects," including bike lanes, walkways, and traffic reduction projects like speed bumps, set up as temporary solutions before being instated permanently, is discussed. It is shown that these temporary projects have a positive impact on people's perceived safety and are generally well received by communities, providing a mechanism for policymakers and planners to pilot low-cost ideas for urban development. However, it is also demonstrated that most of these projects fail to have a permanent impact on the development of infrastructure related to improved outcomes like physical fitness due to poor measurement and reporting. In conclusion, it is stated by the authors that while these projects may be beneficial for community engagement and pilot-testing, there is a need for greater examination regarding actual impact on community health outcomes.

Hartley, (2023) examined that attention was given to how citizens of Hong Kong feel about the concept of smart cities and their belief on whether such schemes can enhance their lifestyles and the functionality of their governments. As per a survey conducted on over 800 people, the author discovers that on average, there seems to be far more confidence about improving their lifestyles pertaining to transport systems, health-related affairs, and educational facilities than there is regarding enhancing aspects such as transparency and public consultation. Also,

people that are vaguely aware of the concept of "smart cities" appear to have more optimistic views regarding its benefits, people with advanced knowledge and economic standards seem to harbor doubts. Overall, it seems to be very clear and informative that just technologically advanced systems are not sufficient to have any successful execution of smart city policies.

Pons et al., (2023) examined the possibilities of 5G in enabling the Internet of Things (loT) and also discusses the critical issues related to 5G technology. It is clear from this paper that the concept of 5G along with the internet of things has immense possibilities in making different sectors intelligent and more efficient by enabling high speed, low latency, and connectivity. But it is also discussed in this paper that there are critical issues related to 5G technology, like overlapping of signals, costly infrastructure, securing, and optimization, which may resist these possibilities. The paper is very helpful, and it clears again that 5G and internet of things have immense possibilities, but by resolving overlaps related to 5G, 5G and internet of things will work successfully.

Universitario & Isidoro, (2023) examined the existing smart city project named PCT Cartuja, located in Seville, Spain, concentrating its efforts to enhance urban life via smart mobility and smart climate solutions and providing an insight into its efforts to mitigate the effect of climate change by overcoming traffic congestion, walking, cycling, and electric mobility, and combatting high temperatures experienced by urban areas. This paper demonstrates that applications of smart mobility solutions like applications, bike lanes, and electricity charging points, combined with smart solutions like the use of renewable energy and natural cooling systems, can lead to more sustainable and healthy urban living conditions and will conclude by stating that all smart city projects require effective coordination and integration of all stakeholders and make projects like PCT Cartuja very effective for other similar cities to adopt in order to overcome similar challenges of urban areas related to climate change and related urban issues.

The, (2024) examined how the COVID-19 outbreak impacted urban governance and strategic planning for Saint Petersburg, Russia, pertaining to SDGs. The authors have also evaluated the development strategies for Saint Petersburg from 1997 to 2035. They conclude that while there is an orientation toward sustainability principles, sometimes there is ambiguity about them. Social development is given prime importance, but other areas such as natural resources, culture, and institutions are regarded as relatively weaker. The article makes it clear that while there is sometimes orientation toward 'smart cities' or 'resilient cities or 'sustainable' ones, sometimes there is no clarity about connecting them with goals. Thus, this review indicates that for effective and sustainable city planning and urban development after the COVID-19 outbreak, there is a need to ascertain priorities of development components while making balanced development, as well as integrating SDGs.

Yin & Song, (2023) examined how different models of urban development, especially the smart city model and sustainable city model, are currently being utilized in urban development practices around the globe. There is a lot of emphasis on the need for a holistic rather than a technological approach. The research highlights that even though smart cities are based on information technology to optimize different services, merely technology alone cannot solve different urban issues. Rather, smart urban models should be utilized to promote different aims such as protecting nature, ensuring citizen social well-being, achieving economic development, and ensuring effective governance. This review highlights, through different global research studies, that urban sustainable development has gradually become a common objective.

Ramón et al., (2023) examined the impact of the increased use of teleworking introduced in the wake of the COVID-19 pandemic on the mobility of European city centers. By conducting a survey on employees in various European cities, the paper establishes that the adoption of teleworking reduced the number of work-related daily trips in the city. This reduced the level of traffic in these city centers. Moreover, the reduced traffic also led to a potential reduction in the number of pollutants in the environment since fewer emissions result in a cleaner environment. However, the paper concludes the review by establishing the potential disadvantage of reduced traffic in city centers. Traffic in city centers may not always be reduced due to increased non-work-related trips. This implies that city employees can reside away from the city center. The concept of teleworking thus has the potential to limit traffic in city centers but does not always offer advantages related to reduced traffic.

Bracchi, (2023) examined the concept of climate-neutral and smart cities through the lens of environmental justice, focusing on the concepts of fairness, inclusion, and equality in the development of environmental policies. The authors argue that, though smart and climate-neutral initiatives in cities promise to achieve sustainability through technology, innovation, and green transitions, they badly ignore social inequalities and may benefit only certain groups of people. The review underlines the inequity brought about by access disparity to smart technologies, exclusion of vulnerable classes, and the shifting of environmental burdens, rather than their reduction, due to

climate policy. Altogether, this paper concludes that the concept of environmental justice should be at the core of city planning for cities to be truly climate-neutral and smart; therefore, efforts toward sustainability should become inclusive, socially just, and of benefit to all society.

Sonn & Lee, n.d.(2020) examined the importance of smart city technologies that played a critical part for South Korea during the COVID-19 pandemic and showed that the country was able to keep the outbreak under control without having to impose lockdowns nationwide thus being able to trace the contacts that the carrier had travelled through and test them for the coronavirus as soon as possible. According to the article, the best part is that the success that South Korea had was not just because of the technology that the city had implemented but also because the city had the advantage of public trust and experience with past outbreaks. This review article will critically explore the concerns that could be potentially raised with the implementation and use of these technologies. This article will conclude that the use of smart city technologies could be extremely useful during times of crisis management, but this needs the proper implementation with structures that will protect the interests and rights of the citizens.

Wang et al., (2024) examined the topic through a critical appraisal of how smart and sustainable cities related to technology are impacting society and the governance of our communities. It states that even though the aim of smart cities is efficiency, innovation, and better public services, they tend to concentrate on technology and economic aspects rather than paying attention to equity and other aspects of society. It is stated that even though smart city projects aim at efficiency, innovation, and better public services for citizens, they concentrate on technology and economic aspects to the point of ignoring equity. The review concludes that for a city to be smart, there is a need to balance scientific advancements and equity and overall well-being.

***National***

Dalal, (2018) analyses the Smart City Mission of India as a major urban development initiative aimed at achieving sustainable and technology-enabled urban growth. The study explains that the mission focuses on strengthening core urban infrastructure, improving smart mobility, enhancing digital connectivity, and promoting citizen-centric governance to improve the overall quality of urban life. The author highlights the role of public–private partnerships and participatory planning in fostering innovation and inclusivity in urban governance. While acknowledging the positive outcomes in terms of urban rejuvenation and service delivery, the study also identifies significant challenges such as financial constraints, uneven implementation across cities, and the persistence of the digital divide. Dalal concludes that addressing these limitations is essential for ensuring the long-term sustainability and effectiveness of smart city initiatives in India.

Priyadarshi, (2021) analyses the consequences of rapid urbanization in India, identifying significant deficiencies in urban planning and governance frameworks. The study observes that unregulated urban expansion has contributed to traffic congestion, environmental degradation, declining green spaces, and the growth of unplanned peri-urban settlements. Within this context, the Smart City Mission is evaluated as a policy response capable of strengthening comprehensive and integrated urban planning. The author argues that aligning smart city initiatives with sustainable development principles and environmental considerations is essential for building resilient and inclusive urban systems in India.

Ahmed & Ali, (2021) examine the development of smart cities in India by analyzing the practices, policies, and current status of the Smart City Mission. The study traces the evolution of the mission as a key government initiative aimed at promoting sustainable, technology-driven, and efficient urban development. It highlights the planning frameworks and policy measures adopted to position Indian cities alongside global smart city models. However, the authors identify several challenges that have hindered the mission's progress, including implementation gaps, institutional inefficiencies, and limitations in technological integration. The study further points out structural and operational gaps that have slowed the overall growth of smart city initiatives, emphasizing the need for stronger policy coordination, effective governance mechanisms, and sustainable implementation strategies.

Aijaz & Hoelscher, (2015) assess India's Smart Cities Mission within the broader context of rapid urbanization, noting that nearly one-third of India's population now resides in urban areas. The study argues that accelerating urban growth has intensified pressures on urban infrastructure, service delivery, and governance systems. It evaluates the Smart Cities Mission as a policy response aimed at addressing these challenges through area-based development, improved urban services, and institutional reforms. The authors highlight both the potential of the mission to enhance urban governance and service efficiency and the limitations arising from implementation delays, capacity constraints, and uneven outcomes across cities. The study concludes that the effectiveness of the

Smart Cities Mission depends on stronger coordination between urban planning, governance structures, and inclusive development strategies.

Gupta & Gupta, (2018) analyses the progress and challenges of smart city development in India within the context of rapid global urbanization and the increasing adoption of digital technologies. The study highlights the role of advanced technologies such as the Internet of Things, cloud computing, big data analytics, and intelligent systems in transforming urban services, including transportation, energy, water supply, waste management, healthcare, and education. While the smart city concept is presented as a comprehensive approach to revitalizing urban systems and improving efficiency, the authors identify several roadblocks in the Indian context, including implementation challenges, infrastructural limitations, and governance-related issues. The study concludes that overcoming these constraints is critical for achieving the intended outcomes of smart city initiatives in India.

***Regional***

Lalruatdiki & Ganguly, (2025) examine the implementation of the Smart City Mission through a case study of Aizawl in Mizoram, focusing on its implications for urban governance in Northeast India. The study analyses key smart city initiatives such as the Integrated Command and Control Centre, Pelican Crossing System, reverse vending machines, and water kiosks, highlighting efforts to integrate digital technologies into urban management and service delivery. While the findings indicate progress in improving infrastructure and governance efficiency, the authors identify persistent challenges related to funding constraints, technological adaptation, equitable urban development, and long-term sustainability. The study concludes that smart city transformation in the Northeast is a gradual process requiring continuous policy refinement, institutional capacity building, and sustained investment to achieve inclusive and sustainable urban outcomes.

Kashyap, (2025) examines urban sustainability in North-East India through the analytical framework of the NER–SDG Index, highlighting the growing pressures of urbanization on sustainable development outcomes. The study notes that rapid urban population growth, driven by natural increase and urban agglomeration, has intensified land-use changes, reduced green spaces, and widened demand–supply gaps in urban civic amenities. These trends have adversely affected the attainment of Sustainable Development Goals (SDGs), particularly in developing and least developed regions. By assessing urban sustainability indicators across North-Eastern states, the study underscores regional disparities and structural challenges in achieving inclusive and sustainable urban growth, emphasizing the need for region-specific planning and policy interventions aligned with SDG targets

Konwar, (2025) evaluates the progress of the Smart City Mission in Guwahati after a decade of implementation, assessing whether the city has achieved the intended outcomes of smarter and more sustainable urban development. The article highlights improvements in selected infrastructure projects, digital initiatives, and urban service delivery while also drawing attention to persistent challenges such as traffic congestion, flooding, uneven project execution, and limited citizen-level impact. The assessment suggests that although Guwahati has witnessed visible changes under the Smart City Mission, the transformation remains partial and uneven, indicating a gap between policy objectives and on-ground realities. The study underscores the need for stronger integration between smart city projects and long-term urban planning to ensure inclusive and resilient urban development.

Habib, (2025) reports on the progress of the Smart City Mission in Guwahati, highlighting substantial infrastructure development under the Guwahati Smart City Limited (GSCL). According to the report, projects worth ₹422 crore have been completed, while infrastructure works amounting to ₹633 crore are in advanced stages of implementation. Key initiatives include the installation of over 2,000 CCTV cameras, development of an Intelligent City Surveillance System, LED-based road lighting, riverfront development, and the upgradation of major tourist and urban infrastructure projects. While the report reflects significant financial investment and visible urban transformation, it also underscores that smart city development is an ongoing and phased process requiring strict adherence to timelines, quality execution, and sustained governance efforts to achieve long-term urban sustainability.

Kaushik et al., (2015) analyses Guwahati city's progress towards smartness by examining the integration of hard and soft infrastructure under the Smart City framework. The study identifies Guwahati as a key urban centres in Northeast India and a frontrunner in the Smart City Mission due to its economic and regional significance. Using city-level data mapped against proposed smart city components, the authors highlight initiatives aimed at improving basic urban services, strengthening infrastructure, and adopting information and communication technologies to enhance transparency and governance. The study further proposes a set of targeted, city-specific measures which, if implemented effectively, could transform Guwahati into a sustainable and well-governed smart

city. The findings emphasize the importance of tailored urban strategies aligned with local needs for successful smart city development.

## 3. RESEARCH GAP

Existing literature on the Smart Cities Mission mostly revolves around the policy and technology areas, rather than around perception-based assessment at the user level. In fact, empirical studies that identify students as a special category of stakeholders are few and far between, and more so in the context of Tier-II cities in the Northeast regions of India, like Guwahati. The existing literature also fails to notice the perceived efficiency, inclusivity, and sustainability of smart city policies and strategies at various levels of education. This creates a gap for a student-centric empirical analysis.

## 4. OBJECTIVES OF THE STUDY

1. To examine the level of awareness among students in Guwahati regarding Smart City initiatives implemented under the Smart Cities Mission.
2. To analyze students' perceptions of the effectiveness of smart city development in improving urban services such as transportation, digital infrastructure, governance, and quality of life.
3. To identify the perceived benefits, concerns, and overall acceptance of smart city initiatives among students as key urban stakeholders.

## 5. RESEARCH METHODOLOGY

In the current study, the research design used is descriptive and analytical to investigate the student's perceptions of the Smart City Mission in Guwahati. This study particularly focuses on the students as primary stakeholders since they actively participate in the use of the urban infrastructure and technology. In addition to that, they will soon become decision-makers.

**Population & Sample:** The target population of this research included students in Guwahati, pursuing higher education at different levels such as higher secondary, graduation, post-graduation, and research (PhD) programs. The student population was selected for this study since they belong to a mixed category regarding the level of civic awareness among them.

A non-probability convenience sampling method has been adopted for the study as a result of constraints on accessibility. The data collection has been conducted among the students of various educational institutions in Guwahati.

**Data Collection:** Data was gathered using a structured questionnaire administered using Google Forms. The structured questionnaire had a mix of both closed-ended and Likert-scale questions that sought to determine:

i. Awareness of Smart City Mission,
ii. Perceptions on smart city projects in Guwahati,
iii. Satisfaction with intelligent infrastructure and urban services, and
iv. Issue areas related to the inclusion of the community, the environment, and governance.

The online based method for data collection was also deemed appropriate given the familiarity of the student population with the internet and it also enabled us with a wide coverage within a short time frame.

**Data Analysis**: A descriptive statistical analysis was conducted on the collected data using percentage analysis and graphical presentations as offered by Google Form analysis. These analyses were conducted based on the objectives of the study, referring to the literature on smart cities, participating urban governance, and sustainable urban developments.

**Ethical Considerations:** Voluntary survey responses were obtained, and the academic intentions of the survey were explained to the participants. The survey was anonymous and confidential.

## 6. DATA ANALYSIS AND INTERPRETATION

**Profile of Respondents:** The respondents are predominately students, majority falling under the 18 to 22 and above age group. The educational background of the students reflects their awareness and opinions about the city.

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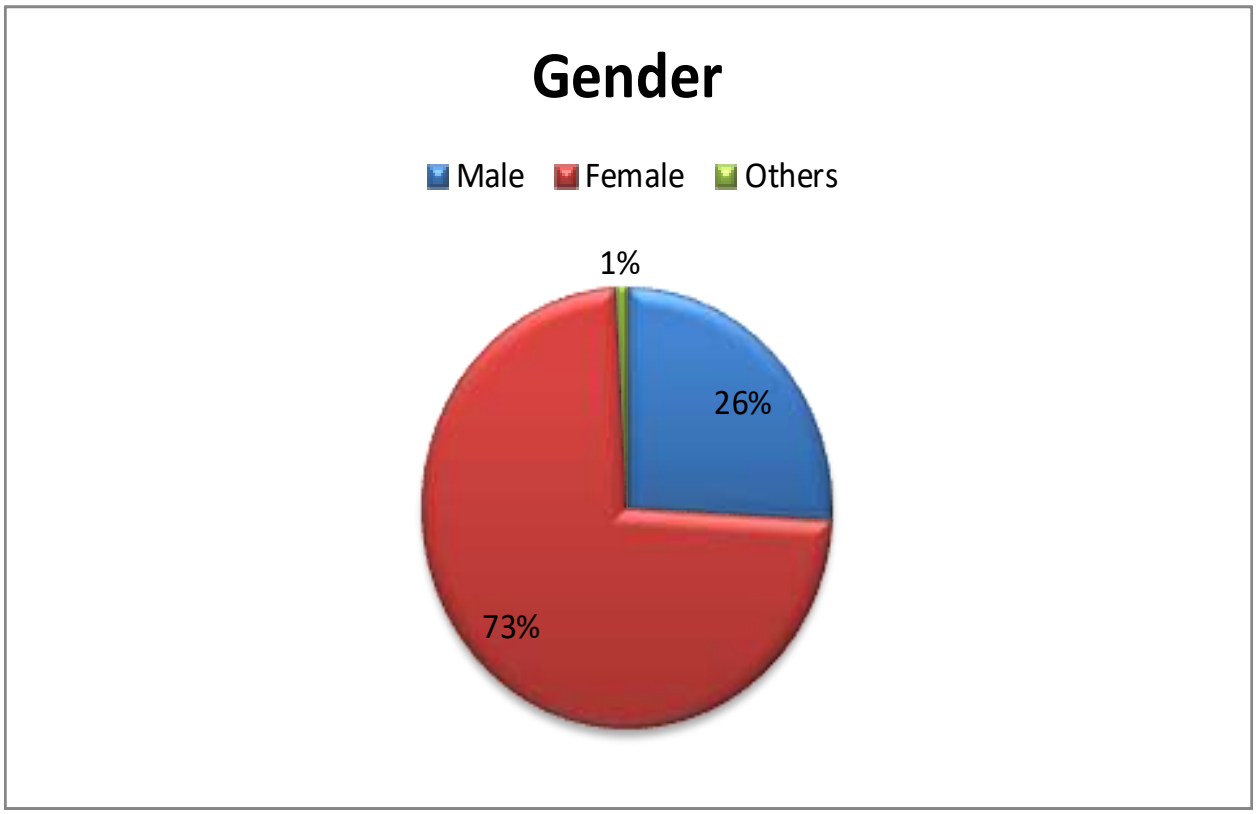


**Figure 1: Gender of the Respondents**

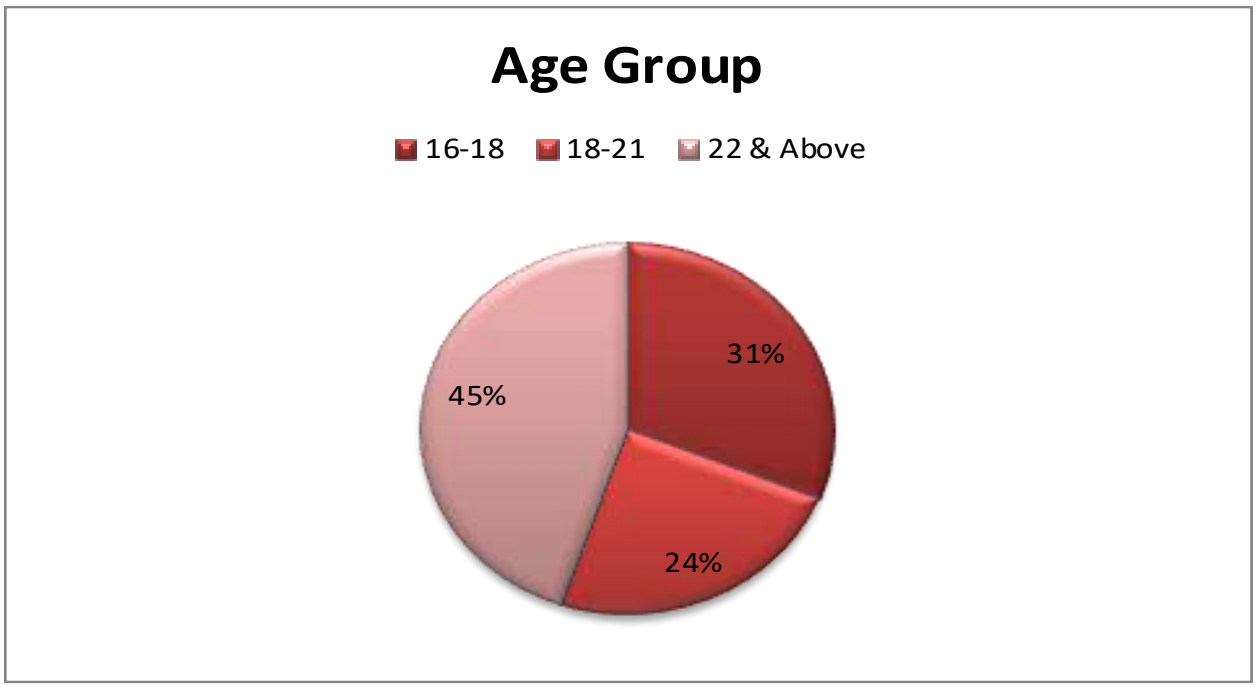


**Figure 2: Age Group of the Respondents**

- **Have you heard about smart city mission?**

The findings indicate a high level of awareness of the Smart City Mission, with 87 per cent of respondents reporting that they have heard about it, while 13 per cent stated that they were not aware of the initiative.

- **How aware are you about the smart city mission?**

The level of awareness regarding the Smart City Mission, measured on a five-point scale, shows that 31 per cent of respondents reported a moderate level of awareness (scale point 3). Higher awareness levels were indicated by 18 per cent and 15 per cent of respondents at scale points 4 and 5 respectively, while 20 per cent and 16 per cent

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reported lower awareness at scale points 2 and 1. Overall, the findings suggest a predominantly moderate awareness of the Smart City Mission among respondents.

- **Is Guwahati city under smart city mission?**

The results indicate that a vast majority of respondents (96 per cent) are aware that Guwahati is included under the Smart City Mission, while only 4 per cent reported otherwise, reflecting a high level of awareness regarding Guwahati's status in the mission.

- **Where have you heard about smart city mission?**

**Table 1: Awareness of Smart City Mission**

| Where have you heard about smart city mission | Number of Respondents | Total Number of Respondents | Percentage of Respondents |
|---|---|---|---|
| Government Website | 48 | 116 | 41% |
| Newspaper | 26 | 116 | 22% |
| Television/Radio | 25 | 116 | 22% |
| Facebook/Instagram | 52 | 116 | 45% |
| Family & Friends | 44 | 116 | 38% |

**Source: Field Survey**

**Awareness of Smart City Mission (SCM):** A large number of respondents were aware of the Smart City Mission. Very few persons chose "Not aware". This is an indication SCM has attained awareness among the youth. The sources of information about the Smart City Mission vary among respondents, with social media platforms such as Facebook and Instagram emerging as the most common source (52 respondents). This is followed by government websites (48 respondents) and family and friends (44 respondents), indicating the importance of both official and interpersonal channels. Traditional media sources such as newspapers (26 respondents) and television or radio (25 respondents) play a relatively smaller role in disseminating information about the mission.

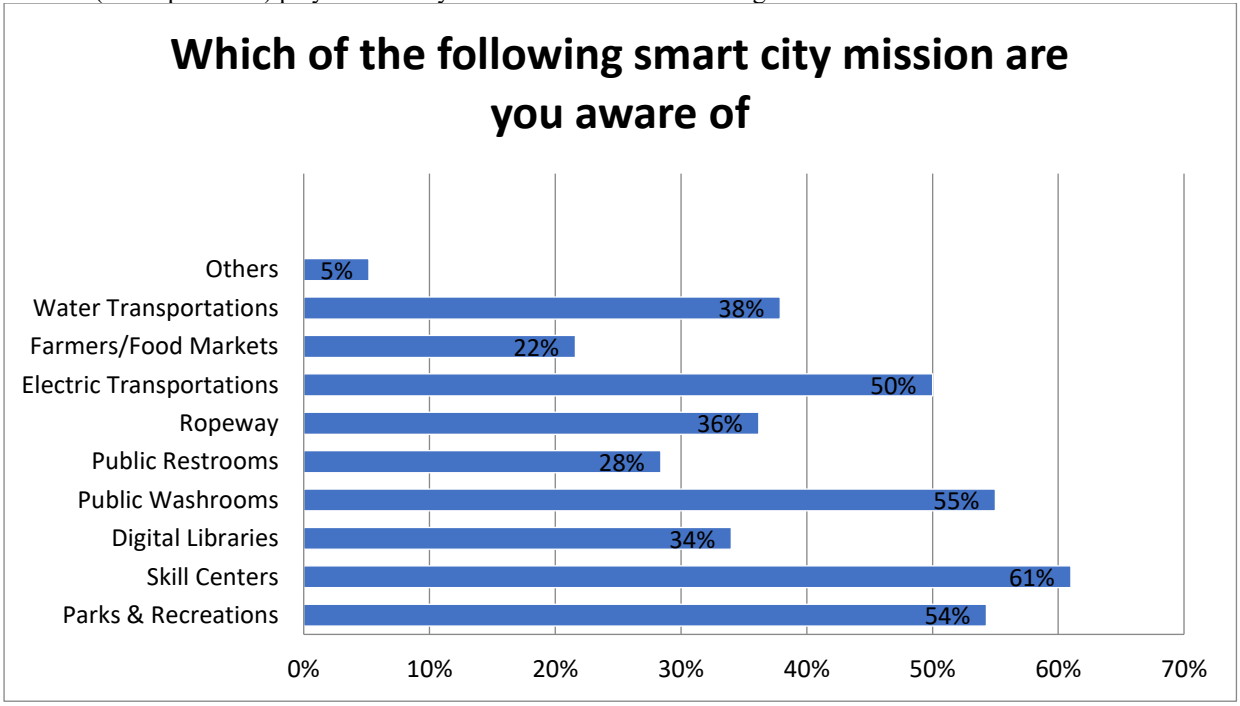


**Figure 3: Awareness of SCM schemes**

The awareness of various Smart City Mission components shows noticeable variation among respondents. Awareness is highest for skill centers (61%), public washrooms (55%), and parks and recreation facilities (54%), followed by electric transportation initiatives (50%). Moderate levels of awareness are reported for water transportation (38%), ropeway projects (36%), and digital libraries (34%). In contrast, lower awareness is observed for public restrooms (28%) and farmers/food markets (22%). Only a small proportion of respondents (5%) reported awareness of other initiatives, indicating that awareness is largely concentrated on select components of the Smart City Mission.

- **How important do you think the smart city mission is for Guwahati?**

The findings indicate that the Smart City Mission is perceived as highly important for Guwahati. A majority of respondents rated its importance at the highest level (5), accounting for 53 per cent, followed by 21 per cent who rated it at level 4. Moderate importance (3) was reported by 15 per cent of respondents, while lower importance levels were indicated by 5 per cent (level 2) and 6 per cent (level 1). Overall, the results reflect a strong positive perception of the importance of the Smart City Mission for Guwahati.

- **Perception of Smart City Initiatives in Guwahati:** Participants exhibit a moderate to positive perception regarding different initiatives by the government. They strongly expect for:

- Digital services,
- Smart mobility concepts,
- Technology-enabled governance.

The students seem to relate "smartness" only with technology and efficiency, and not with inclusion or environmental resilience. This indicates an understanding that is tech-oriented about smart cities, which is also acknowledged in literature around the globe regarding smart cities.

- **Do you think this mission will help develop Guwahati?**

The results show an overwhelmingly positive outlook toward the Smart City Mission, with 97 per cent of respondents believing that it will contribute to the development of Guwahati, while only 3 per cent expressed a contrary view. This indicates strong public confidence in the mission's developmental potential.

| Statements | Percentage of respondents saying 'Yes' | Percentage of respondents saying 'No' |
|---|---|---|
| Do you think this mission will improve traffic management in Guwahati? | 88% | 12% |
| Do you think this mission will reduce flooding in Guwahati? | 73% | 27% |
| Are you satisfied with digital services provided by the assam government like Assam Setu? | 70% | 30% |
| Has the smart city mission contributed positively in your life? | 87% | 13% |
| Are you satisfied with the grievances Redressal forums? | 65% | 35% |
| Do you like the garbage disposal mechanism of the government? | 62% | 38% |
| Are you using the new smart classrooms installed in government schools? | 55% | 45% |
| Have you accessed research papers through the new Digital Library Portals? | 47% | 53% |
| Is your college/university area now covered by the city's smart surveillance network? | 70% | 30% |
| Are the new electric buses making your daily commute more affordable? | 80% | 20% |
| Are the smart water ATMs providing you with clean drinking water while you commute? | 66% | 34% |
| Are you enrolled in any tech-courses at the North East Skill Centre? | 66% | 34% |
| Have you used the Public Toilets/Public Restrooms while commuting? | 64% | 36% |
| Does the revitalized Brahmaputra Riverfront provide you with better relaxing sports? | 91% | 10% |

**Table 3: Perception on the Smart City Mission**

**Source: Field Survey**

The survey results indicate that the Smart City Mission in Guwahati is generally well-received by the public, with a majority of respondents reporting positive impacts across various aspects of urban life. High approval ratings were observed for traffic management (88%), contribution to daily life (87%), and revitalized Brahmaputra Riverfront for recreation (91%), showing strong public satisfaction with visible infrastructure and lifestyle improvements. Digital services like Assam Setu (70%) and smart surveillance coverage (70%) are also appreciated, though usage of smart classrooms (55%) and digital library portals (47%) shows relatively lower engagement, indicating room for wider adoption. Essential services such as new electric buses (80%), smart water

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ATMs (66%), and public toilets (64%) are seen as beneficial, while citizen satisfaction with grievance redressal forums (65%) and garbage disposal mechanisms (62%) reflects moderate confidence. Participation in tech courses at the North East Skill Centre (66%) suggests positive outcomes in skill development. Overall, the data reflect strong optimism about the mission, though some areas, particularly digital engagement and citizen service access, may require further improvement to achieve maximum impact.

- **Do the frequent power outages still disrupt digital learning and online exams?**

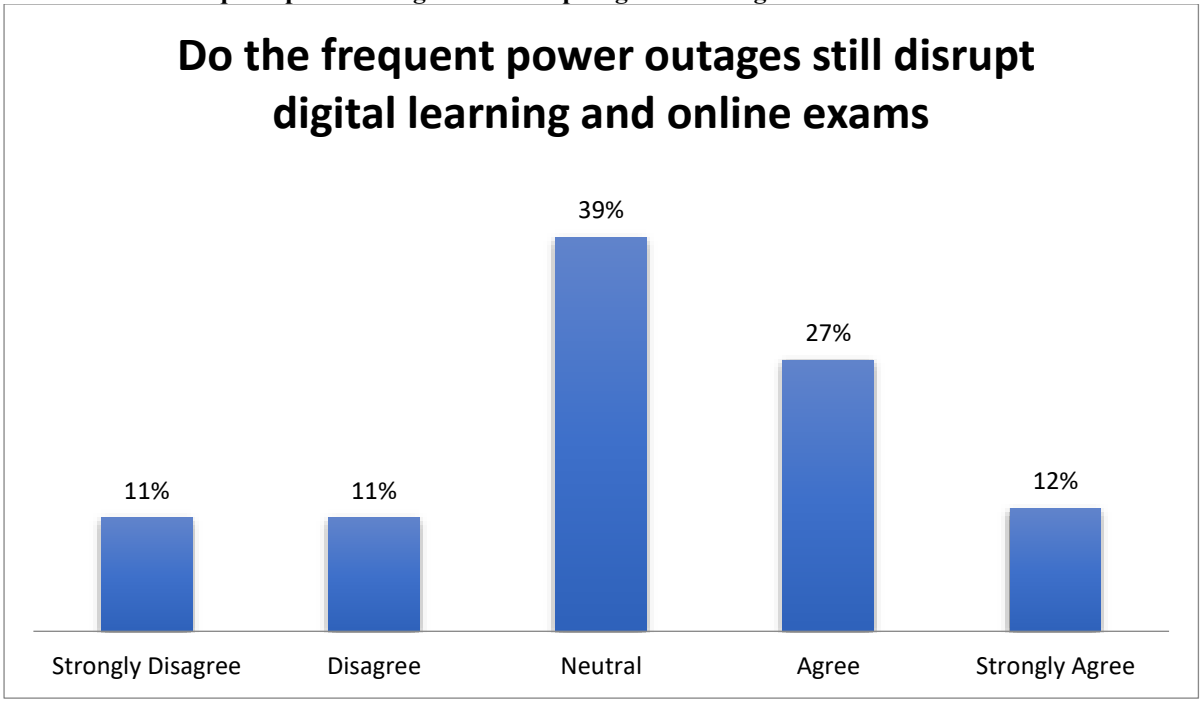


**Figure 4: Frequent Power Outages Issue**

The survey reveals that power outages continue to affect digital learning and online exams in college and school areas. While 27% of respondents agree and 12% strongly agree that outages disrupt their studies, a combined 22% disagree or strongly disagree, indicating that not all students face this issue. A significant portion (39%) remained neutral, suggesting varied experiences. Overall, the findings highlight ongoing challenges with electricity reliability, although the neutral responses and disagreements suggest that some improvements may have been observed

- **Does your college or school area still suffer from artificial flooding during rains?**

The findings indicate that 71% of respondents report that their college or school area still experiences artificial flooding during rains, while 29% do not. This suggests that despite Smart City initiatives, drainage and water management systems in educational zones remain insufficient. However, people remain optimistic that continued improvements and infrastructure development will eventually resolve these issues.

- **Is it difficult to find a functional Smart Water ATM near your campus?**

The results show that 69% of respondents find it difficult to locate a functional Smart Water ATM near their campus, while 31% do not face this issue. This suggests that access to smart water facilities is limited or inconsistent, highlighting the need for better placement, maintenance, and visibility of water ATMs to ensure reliable service for students.

- **Do you find the new electric buses too crowded during peak student hours?**

The findings reveal that 77% of respondents feel the new electric buses are overcrowded during peak student hours, pointing to insufficient capacity in the current public transport system. Only 23% reported no issues, indicating that most students face challenges with bus congestion. This underscores the need for better planning, increased bus frequency, or additional routes to improve commuting conditions during busy periods.

- **Has the mission successful removed the smell of garbage from student residential zones?**

The findings show that 69% of respondents feel the Smart City Mission has successfully reduced unpleasant garbage smells in student residential areas, while 31% do not share this view. This suggests that although

improvements have been observed in many locations, sanitation and waste management measures are not yet uniformly effective across all student zones.

- **Do you think the city's air quality has worsened despite smart city initiatives?**

The results indicate a strong perception that Guwahati's air quality has worsened despite Smart City initiatives, with 80% of respondents expressing this view. Only 20% disagreed, suggesting limited confidence in the effectiveness of current measures to address air pollution. This finding implies that environmental sustainability, particularly air quality management, is perceived as an area where Smart City interventions have not yet delivered visible improvements, highlighting the need for stronger environmental planning and pollution-control strategies.

- **Was your opinion ever sought by Guwahati smart city mission for any local projects?**

The findings reveal very limited public participation in the Guwahati Smart City Mission. Only 10% of respondents reported that their opinion was ever sought for local projects, while an overwhelming 90% stated that they were not consulted. This indicates a significant gap in citizen engagement and participatory planning, suggesting that decision-making under the mission may be largely top-down. The result highlights the need for stronger mechanisms to involve residents in planning and implementation to ensure that Smart City initiatives better reflect local needs and concerns.

- **Do you feel the mission prioritizes city beautification over student needs?**

The results indicate a strong perception that the Smart City Mission prioritizes city beautification over student needs, with 78% of respondents agreeing with this view. Only 22% disagreed, suggesting limited confidence that student-specific requirements are being adequately addressed. This finding highlights a perceived imbalance in project focus and underscores the need for greater attention to educational infrastructure, student facilities, and youth-oriented development within the Smart City framework.

- **Is there a reliable mobile app to report broken smart infrastructure in your area?**

The findings reflect mixed opinions about the existence of a reliable mobile application for reporting damaged smart infrastructure. Just over half of the respondents (54%) acknowledged the availability of such an app, while 46% indicated that no reliable platform exists. This suggests that although digital reporting tools are in place, issues related to visibility, usability, or trust may limit their effectiveness among a significant portion of the population.

- **Has the smart city mission positively affected your everyday life?**

The findings indicate that a majority of respondents (69%) believe the Smart City Mission has positively affected their everyday life, suggesting noticeable improvements in urban services and infrastructure. However, 31% of respondents reported no positive impact, highlighting that the benefits of the mission may not yet be evenly experienced across all sections of the population. Overall, the results reflect a generally favorable perception of the Smart City Mission, while also pointing to the need for more inclusive and widespread implementation.

- **Satisfaction with Smart Infrastructure & Services:** The degree of satisfaction is mixed among students but not overwhelmingly positive. There are several neutral responses as well. It is important for the success of a Smart City that it doesn't only focus on beautification but also provide good user experience.

- **Key Concerns Highlighted by Students:** Some of the concerns of students are:

- Traffic congestion
- Flooding and drainage
- Garbage disposal/ Sewage
- Environmental Degradation
- Inequality in Smart Services
- Accessibility to smart services

Despite the branding of Guwahati as a smart city, primary urban challenges continue to be unresolved, especially in the fields of environmental conservation, traffic and transportation. This discovery is absolutely pivotal, adding an indispensable level of complexity to our findings. It brings in the topic of environmental justice, which is appreciated by the students.

**Inclusivity & Equity:** Some respondents were worried about the unequal distributions of benefit among Guwahati residents. There is a perception that there are only region-specific development and other areas of Guwahati is neglected. It also indicates spatial inequality in smart city development. This contradicts critical literature, which

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contends that smart cities can perpetuate urban inequality unless inclusivity becomes mainstream. This supports critical literature arguing that smart cities may reproduce urban inequality if inclusivity is not mainstreamed.

**Total Acceptance of Smart City Mission:** People generally endorse this notion of SCM. Conditional Acceptance: "Good concept, but needs better execution". It means that

They are not rejecting SCM, but rather they are saying: better planning, "environmental sensitivity participatory mechanisms. It places the students in the role of constructive critics, not passive recipient.

- **Five Years from now which of the following urban challenge do you expect the smart city mission to have solved most effectively in Guwahati?**

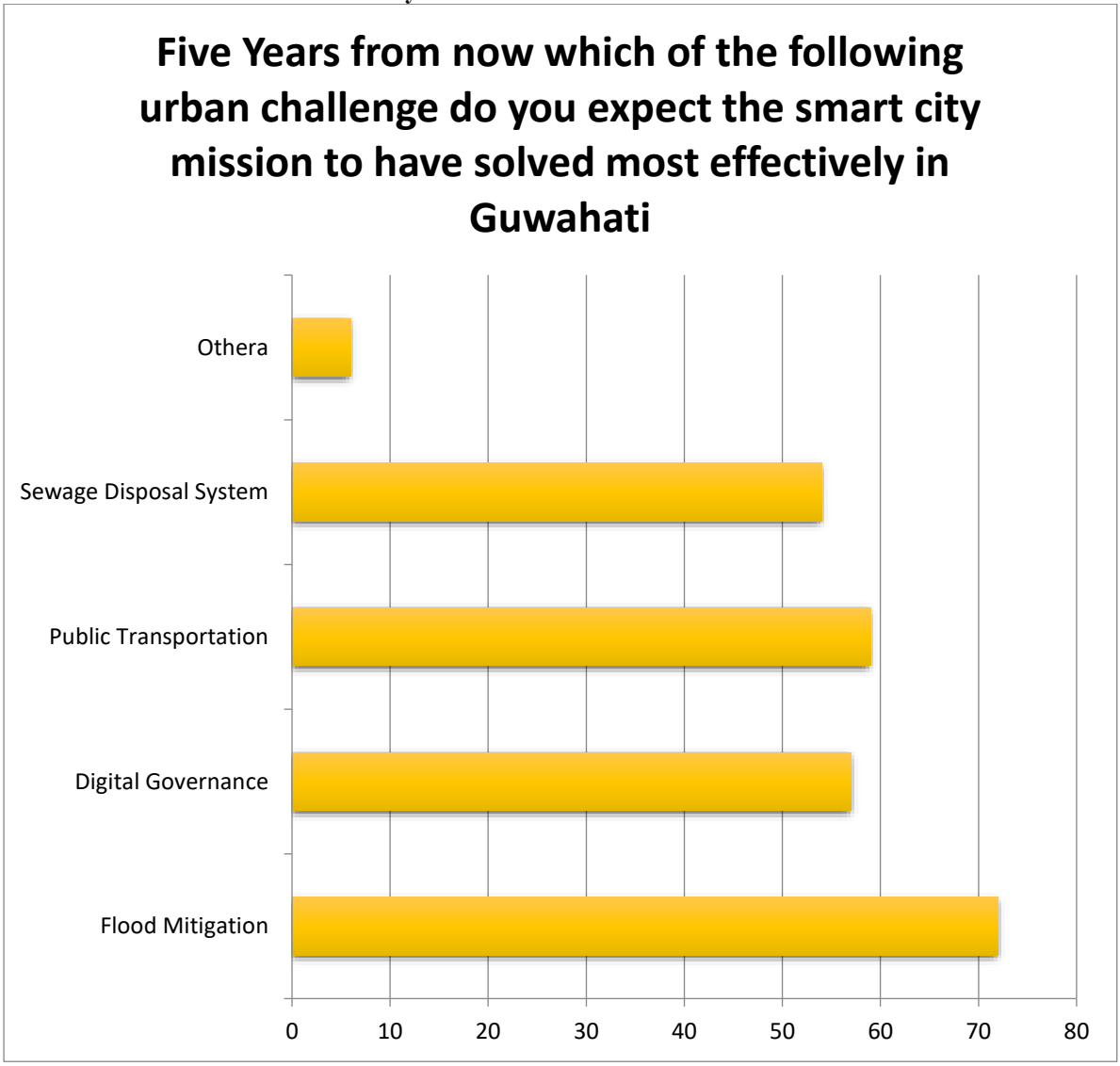


**Figure 5: Future prospects of Smart City Mission**

The results show that flood mitigation (62%) is expected to be the most effectively addressed urban challenge by the Smart City Mission in Guwahati. This is followed by public transportation (51%) and digital governance (49%), indicating moderate confidence in improvements to mobility and administrative services. Sewage disposal (47%) also received considerable attention, while only 5% of respondents identified other challenges. Overall, the findings suggest that flood management is viewed as the top priority, with balanced progress expected across other key urban sectors.

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- **By 2030 do you expect Guwahati's Smart Infrastructure to have created enough local IT and tech opportunities to prevent 'brain drain' from the state?**

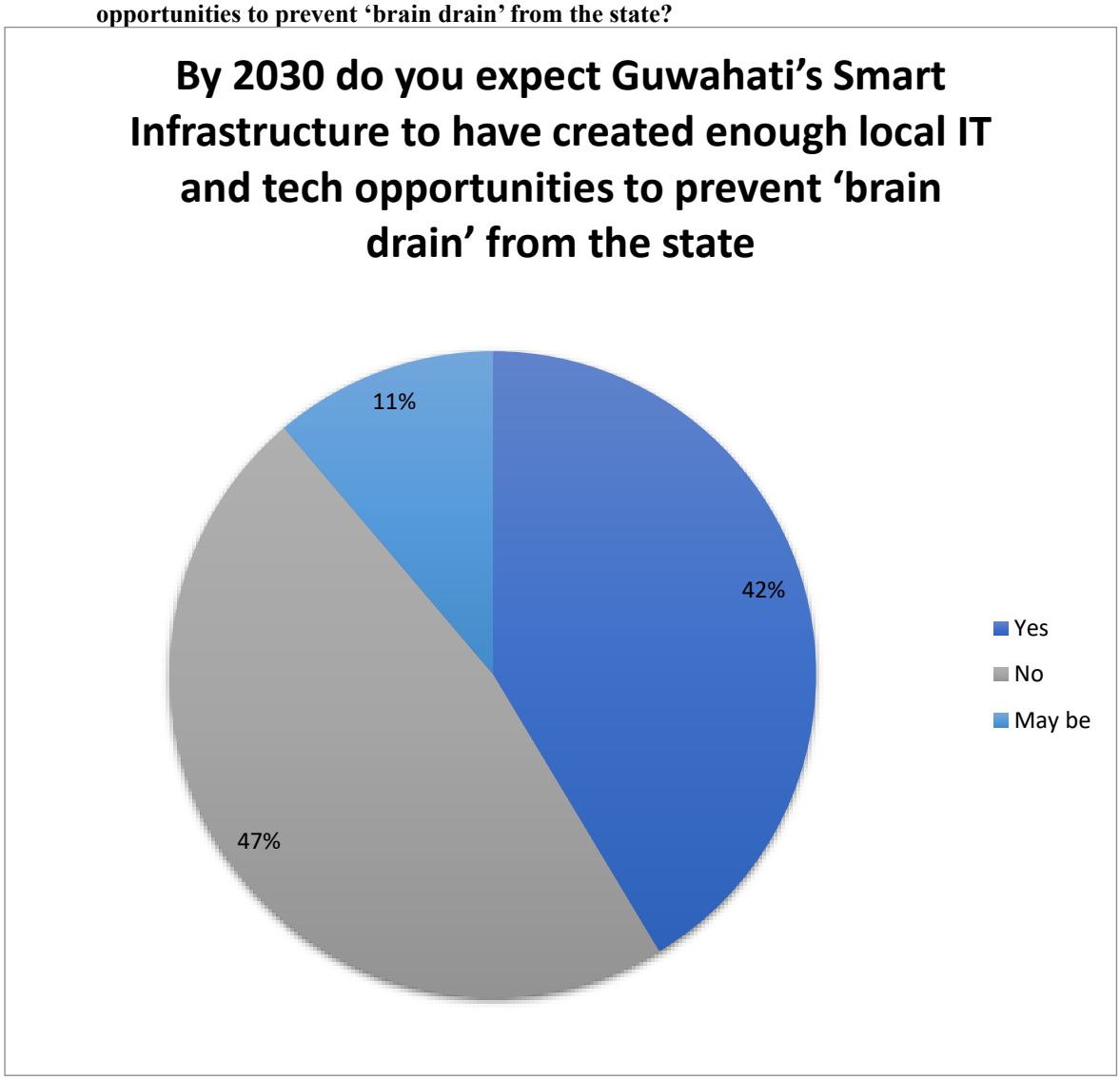


**Figure 6: Brain drain issue**

The findings indicate a cautiously optimistic but uncertain outlook regarding Guwahati's Smart Infrastructure and its ability to prevent brain drain by 2030. While 42% of respondents believe that smart infrastructure will create sufficient local IT and technology opportunities, only 11% disagree, showing relatively low pessimism. However, the largest group (47%) selected "Maybe," reflecting uncertainty about whether planned initiatives will translate into sustainable employment outcomes. Overall, the results suggest that smart infrastructure has potential, but its effectiveness in curbing brain drain will depend on successful implementation, private sector involvement, and long-term skill development initiatives.

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- **Do you expect that in 5 years, the smart city mission will have significantly improved the ease of living index for the average resident in Guwahati?**

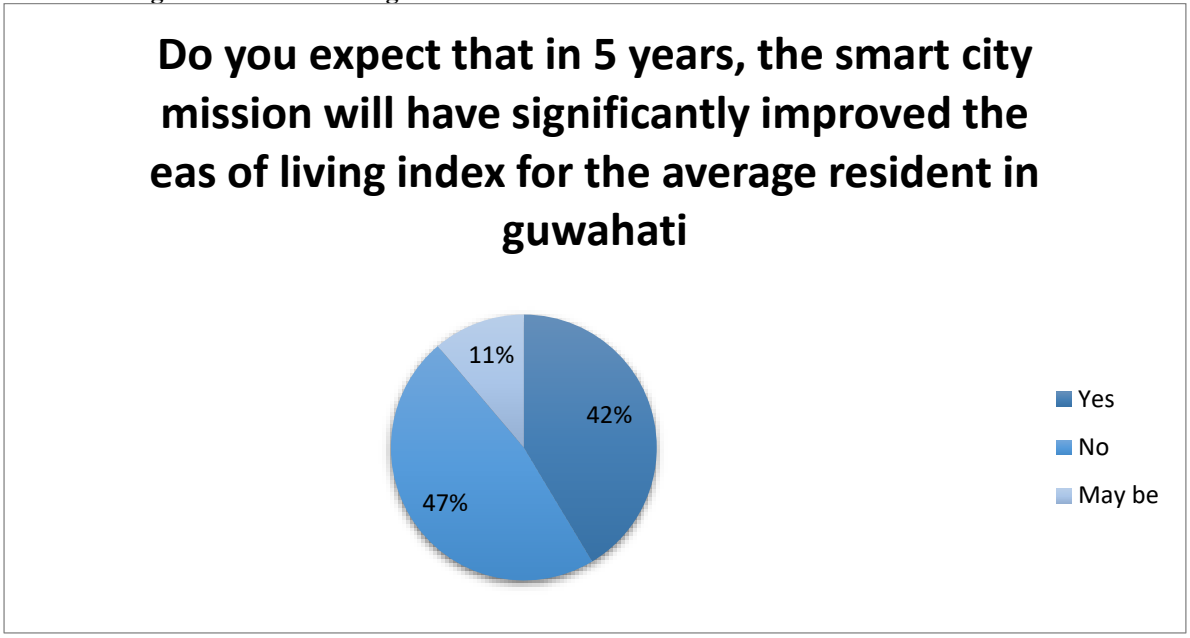


**Figure 7: Ease of Living Index**

The findings reveal a generally optimistic outlook regarding the future impact of the Smart City Mission on the ease of living in Guwahati. Nearly half of the respondents (49 per cent) expect a significant improvement in the ease of living index within the next five years. Meanwhile, 41 per cent expressed uncertainty by selecting "maybe," indicating cautious optimism, while a smaller proportion (10 per cent) did not expect a significant improvement. Overall, the results suggest positive expectations, tempered by some uncertainty about the extent of future outcomes.

## 6. SUGGESTIONS

Based on the findings from this study and responses obtained from student, the following suggestions are recommended with a view to improve effectiveness and equity of Smart City Mission among students and residents of Guwahati city:

i. Enhancement of Basic Urban Infrastructure: The need for smart city projects to first concentrate on basic urban problems like traffic, road conditions, drainage, and flooding has been stressed by the respondents.
ii. Environmentally Sensitive Urban Planning: Several students mentioned the importance of eco-friendly planning, especially for a flood susceptible place such as Guwahati. Eco-friendly spaces, drainage, and conservation of sensitive lands have been mentioned.
iii. Inclusive and Area Wide Implementation: The beneficiaries of smart city developments should not be limited to specific areas. The development of all areas in the city, including the outer areas and the areas where students live, was considered imperative. Improving
iv. Public Transportation and Mobility: Several respondents recommended for improvements in the transportation including better public transport systems, walkways, and traffic management systems.
v. Increased Students and Youth Participation: There should be institutional platforms where students can engage, such as student consultation forums, feedback platforms, and awareness initiatives, to ensure participatory governance in the planning of smart cities.
vi. Transparency and Awareness Campaigns: They felt that a lack of transparency with respect to the objectives and results of projects was a major issue. Awareness programs should be carried out via educational centers.
vii. Other Regional Development: The proposed idea of developing Silchar, Dibrugarh, Jorhat, and Tinsukia as smart cities can alleviate some pressures, particularly from Guwahati, in terms of migration by developing a similar opportunity base for these regions. Developing infrastructure, interconnectivity, and industries in the Upper Assam urban belt can ensure a growth corridor for that entire region, resulting in a spillover effect that would have a positive impact upon neighboring states, like Arunachal Pradesh, via trade, movement, and services.

## 7. CONCLUSION

This paper investigates students' views of the Smart City Mission in Guwahati and focuses on students pursuing higher secondary, undergraduate, postgraduate, and research degrees. Findings of this paper show that the level of awareness of students regarding the Smart City Mission is quite high, which shows how prominent the Smart City Mission has become within the campus of educational institutions. But it should be noted that awareness and impressions are quite different, as impressions of students regarding implementation are moderate.

The analysis shows that students are more likely to relate smart city development with technological progress and digital governance. At the same time, students are also apprehensive and concerned with regards to the issue of uneven development, a lack of inclusivity, and ongoing problems with regards to congestion, floods, and pollution. Contradictory levels of dissatisfaction suggest that, although there is progress with regards to smart initiatives, this progress has not had a uniform impact on the city of Guwahati.

Notably, the students show a conditionally acceptable attitude towards the Smart City Mission. They support the goals of the Smart City Mission but stress the importance of better implementation, environmental consideration, and citizen engagement. By giving importance to student opinions, it is established that youth opinions must also be included when there is a governance and policy analysis of the smart city project. The results have reaffirmed that a smart city project must not only implement information and communication technology solutions but also have sustainable development practices.

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