

Assessing Smart Cities in Developing Countries: Multidimensional Approaches

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Abstract. This paper explores the multidimensional approaches to evaluating smart cities in the context of developing countries. While traditional evaluation frameworks—such as classification, maturity, data-driven management, and innovation ecosystems—have offered valuable insights into the technological and institutional dimensions of smart cities, they often neglect crucial social and cultural aspects. To address this gap, we introduce the Conscious and Inclusive Communities approach, emphasizing the active participation of local communities in all stages of smart city development. This new framework ensures that smart city initiatives are not only technologically advanced but also socially equitable and culturally aware, particularly in regions where inequality and exclusion present significant barriers to sustainable urban growth. By conducting a systematic literature review, this paper synthesizes existing approaches while highlighting the necessity of integrating social inclusion and community engagement into smart city evaluations. The findings offer a comprehensive framework for policymakers and urban planners, guiding the development of smart cities that are both innovative and inclusive.

Keywords: Smart Cities, Developing Countries, Evaluation Frameworks, Community Inclusion, Sustainable Urban Growth.

1 Introduction

In recent years, the concept of smart cities has gained significant traction worldwide, particularly as urban areas face increasing pressures from rapid population growth, resource management, and infrastructure challenges. Smart cities have been promoted as potential solutions for improving the efficiency, sustainability, and inclusiveness of urban systems [1]. In developing countries, where infrastructure gaps, governance complexities, and socio-economic inequalities are prominent, the promise of smart cities has been met with both optimism and caution [1]. While these cities offer innovative solutions through the use of digital technologies like the Internet of Things (IoT) and big data analytics, they also face significant challenges, such as high financial costs, large informal economies, and the need for stronger governance frameworks. However, the adoption of smart cities in developing nations presents unique challenges due to infrastructure gaps, socio-economic inequalities, and varying levels

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of technological readiness. Thus, the evaluation of smart cities in these contexts becomes critical to ensure that they deliver on their promise of inclusive and sustainable development [2].

Evaluating smart cities involves understanding how well they integrate technology, governance, innovation ecosystems, data management, and, crucially, social inclusion. Existing frameworks for smart city evaluation typically focus on four key approaches: classification, maturity, data-driven management, and innovation ecosystems [1,2]. While these approaches provide valuable insights into the technological and institutional dimensions of smart city development, they often overlook the importance of community engagement and inclusivity, which are vital in ensuring that the benefits of smart cities are equitably distributed. To address this gap, this paper introduces a fifth approach: Conscious and Inclusive Communities. This new framework emphasizes the active participation of local communities in the design, implementation, and governance of smart city projects, ensuring that urban transformation is not only technologically advanced but also socially equitable.

As a methodological approach, this paper will conduct a literature review to systematically examine the existing frameworks for evaluating smart cities in developing countries [1]. The goal is to identify and synthesize the most relevant evaluation approaches and explore how they can be adapted to the unique socio-economic and technological realities of these countries. This review will not only incorporate the four widely recognized approaches but also propose a fifth, more socially inclusive approach that addresses the gaps identified in the current literature.

1.1 Evaluation of smart cities in developing countries

The evaluation of smart cities has become a growing field of study, particularly as cities worldwide face increasing pressures to address issues such as rapid urbanization, resource scarcity, and social inequality. In recent years, several approaches have been proposed to assess the development and impact of smart cities. These include ranking models, which compare cities based on specific performance indicators; maturity models, which assess the stage of technological and institutional development; and data-driven management models, which focus on the real-time use of big data and analytics for urban governance. Additionally, innovation ecosystem frameworks have emerged, emphasizing the role of collaboration between governments, industries, academia, and citizens in fostering smart city solutions.

Despite the progress made in evaluating smart cities, much of the existing literature focuses on developed nations, where infrastructure, governance, and technological resources are more readily available. In contrast, developing countries face distinct challenges, such as inadequate infrastructure, socio-economic disparities, and limited access to advanced technologies. As a result, the evaluation frameworks commonly used in developed countries may not fully capture the realities and needs of cities in developing regions.

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Furthermore, while the four traditional approaches (classification, maturity, data-driven management, and innovation ecosystems) provide valuable insights into technological and institutional dimensions, they often fall short in addressing social inclusion and community engagement. In the context of developing countries, where urban inequality is more pronounced, it is crucial to evaluate how smart city projects are impacting not only economic efficiency and technological advancement but also the well-being of marginalized communities.

This paper, therefore, seeks to fill this gap by exploring the question: *"What are the main approaches used to evaluate smart cities in developing countries, and what key aspects are considered in these evaluations?"*

In addition to the existing four approaches, this study proposes a fifth approach—*Conscious and Inclusive Communities*—which emphasizes the active participation and inclusion of local communities in the smart city development process. This approach is crucial to ensure that smart city initiatives are equitable and meet the diverse needs of all citizens, particularly in regions where inequality is a significant barrier to sustainable development.

To address the unique challenges and opportunities presented by smart cities in developing countries, this paper adopts a comprehensive approach that combines established evaluation frameworks with a new socially inclusive perspective. The following sections are organized as follows: Section 2 provides an in-depth literature review on the four main approaches to assessing smart cities—classification, maturity, data-driven management, and innovation ecosystems—while introducing the Conscious and Inclusive Communities approach. Section 3 discusses key findings, highlighting the practical and theoretical implications for urban planners and policymakers. Finally, the conclusion offers recommendations for implementing these multidimensional frameworks to support more inclusive, resilient, and sustainable urban development in diverse contexts.

2 Methodology

This research employs a Systematic Literature Review (SLR) methodology to examine the various approaches used to evaluate smart cities in developing countries. The SLR focuses on multidimensional evaluation frameworks, incorporating dimensions such as classification, maturity, data-driven management, innovation ecosystems, and social inclusion. The objective is to identify the key evaluation strategies in smart city initiatives and propose a comprehensive framework that integrates these diverse approaches to better suit the context of developing nations.

The methodology for the review follows the standards outlined by [3], combined with the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) guidelines [38]. A detailed review protocol was designed during the initial phase, which set forth the study objectives, research questions, and systematic process for se-

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lecting and reviewing the literature. This protocol includes the specification of databases, keywords, and inclusion/exclusion criteria for the articles reviewed, guided by the central research question.

The selection criteria for this SLR include peer-reviewed academic articles, written in English, and accessible online. Only studies published between 2014 and 2024 were included, as the smart city development agenda has gained significant traction in most developing countries over the last decade. These articles must specifically discuss the evaluation frameworks, challenges, and outcomes of smart city projects. Only studies that addressed the technological, social, governance, and innovation dimensions of smart city evaluation were included. Two widely recognized academic databases, Scopus and Web of Science, which are extensively used for retrieving literature in the social sciences, were employed for gathering evidence. One comprehensive search string focused on relevant keywords related to smart cities and for developing countries was combined using the search process (Table 1).

Table 1. Keywords included in the research string.

Query	String
Smart cities in developing countries	(TITLE-ABS-KEY(("smart cities" OR "smart city" OR "Sustainable city" OR "Sustainable cities" OR "Digital city" OR "Digital cities" OR "Resilient cities" OR "Intelligent cities" OR "Liveable City" OR "developing countries" OR "developing country" OR "developing society" OR "developing societies" OR "middle income countries" OR "middle income country" OR "low income countries" OR "low income country" OR "lower middle income countries" OR "underdeveloped countries" OR "emerging market" OR "emerging economy" OR emerging "economies" OR "less industrialized"))

The initial search yielded 55 sources, which were reduced to 48 after duplicate entries were removed. A preliminary screening of titles and abstracts was conducted to assess relevance, leaving 36 articles that met the inclusion criteria. Many sources were excluded due to their narrow focus on specific smart city technologies that did not directly address the evaluation approaches outlined in the research questions. Full-text reviews of the remaining articles led to a refined list of 25 papers aligned with the study's objectives. After removing two brief papers, a final selection of 23 articles was made. Additionally, relevant references from related studies on smart city evaluation frameworks were included, bringing the total to 26 articles. These selected publications were analyzed for relevant evidence using NVivo 14, a qualitative data analysis software.

3 Smart Cities Assessment: Key Approaches

In the context of developing countries, the assessment of smart cities has gained significant importance as cities increasingly adopt digital technologies to tackle critical challenges such as rapid urbanization, socio-economic inequalities, and sustainability.

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The implementation of smart technologies in these regions holds the potential to substantially enhance the quality of life and the efficiency of urban services, although it also faces unique challenges related to infrastructure and governance. According to Esashika [2], the evaluation of smart cities can be approached through several key frameworks. One such approach focuses on ranking, comparing the performance of different cities using standardized indicators, while another looks at the maturity of smart cities, evaluating their level of technological implementation and public policy development. Additionally, the data-driven management approach emphasizes real-time management through the use of big data, and the innovation ecosystem approach highlights collaboration between governments, academia, industry, and civil society to foster urban innovation.

These approaches, widely applied in global contexts, provide a robust foundation for assessing the progress of smart cities. However, in developing countries, where social inequalities are more pronounced and resources are limited, it becomes essential to complement these perspectives with an additional approach: Conscious and Inclusive Communities. This framework ensures that urban development is not only technologically advanced but also equitable and participatory, placing the needs and realities of local communities at the heart of the transformation process. Table 2 summarizes the generalities of each approach.

Table 2. Smart Cities Assessment.

Key Approach	Generalities
Ranking Approach	Based on rankings which compare the performance of cities based on standardized indicators such as mobility, governance, sustainability, and quality of life.
Maturity Approach	It classifies cities into stages, from early technology implementation to advanced integration of smart solutions.
Data-driven Management Approach	Leverages technologies such as big data, IoT, and sensors to collect and analyze real-time data, optimizing urban services like mobility, waste management, and energy consumption.
Innovation Ecosystem Approach	Emphasizes collaboration between government, industry, and academia to drive urban innovation.
Conscious and Inclusive Communities Approach	Focused on ensuring that smart city development does not exacerbate social inequalities but instead promotes inclusion and equity.

The following section presents these five key approaches, adapted to the assessment of smart cities in developing countries, each offering a critical lens for understanding and improving the process of urban transformation in these regions.

3.1 Ranking Approach

The classification approach to smart city evaluation relies on the use of rankings, which compare the performance of cities based on standardized indicators such as mobility,

governance, sustainability, and quality of life [17]. These rankings provide a quantitative snapshot of how cities perform in key areas of urban development, offering governments, policymakers, and stakeholders a clear view of where their cities stand in comparison to others. By identifying strengths and weaknesses in urban systems, this approach helps to pinpoint specific areas that require improvement, fostering more targeted policy interventions [1].

Several contemporary rankings evaluate smart cities, each with specific regional focuses and criteria. In Europe, the European Smart Cities Ranking by Giffinger et al. [31] continues to be influential, alongside the CITYkeys initiative, which prioritizes sustainability and innovation metrics [32]. Globally, the IMD Smart City Index (2023) and the Networked Society City Index by Ericsson [33] focus on holistic smart city metrics, including connectivity and citizen engagement. Other indices, such as the Smart City Index [34] and the IESE Cities in Motion Index 2023 [35], assess a city's performance across dimensions like mobility, governance, and quality of life, offering a comprehensive view of urban development.

In the context of developing countries, where cities often face significant disparities in infrastructure, technological capabilities, and governance, the classification approach serves as a particularly useful tool for benchmarking progress [1,15]. It allows cities to set clear, measurable goals and track their development over time relative to international standards. This is important for cities striving to enhance their global competitiveness while addressing critical challenges such as poverty, transportation inefficiencies, and energy shortages. Rankings also provide a means to promote transparency and accountability, as they allow citizens and stakeholders to assess the effectiveness of local governance based on visible, standardized criteria.

However, while the classification approach offers substantial benefits, it is not without challenges. In developing countries, there is often a lack of reliable and consistent data, which can undermine the accuracy and usefulness of rankings. Cities in these regions may struggle to collect the high-quality data necessary to measure performance across various indicators due to financial constraints, technical limitations, or insufficient administrative capacity. This data gap can lead to skewed or incomplete evaluations, potentially misrepresenting a city's actual progress or needs. Furthermore, the focus on measurable indicators can sometimes overlook critical qualitative aspects of urban life, such as social inclusion and community engagement, which are harder to quantify but equally essential to the success of smart city initiatives [16].

Despite these challenges, the classification approach remains a powerful tool for urban development in developing countries. It provides a structured, comparative framework that enables cities to benchmark their progress and set ambitious yet achievable targets. For governments, these rankings offer a roadmap to prioritize investments and reforms in areas where cities are lagging behind. Additionally, rankings serve as an important motivational tool, encouraging cities to improve their standing by implementing new policies, technologies, and governance strategies that address their specific shortcomings. The competitive nature of rankings can drive innovation, as cities seek to enhance their performance and visibility on a global stage [18].

In summary, the classification approach is highly valuable in promoting smart city development, especially in developing countries where the need for clear, actionable metrics is crucial. However, it must be adapted to the local context, with efforts made

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to improve data collection processes and account for qualitative dimensions of urban life. Despite its limitations, the visibility and accountability that rankings provide make them an indispensable tool for cities aiming to enhance their sustainability, governance, and overall quality of life.

3.2 Maturity Approach

The maturity approach evaluates a smart city's development by examining factors such as technological infrastructure, the adoption of public policies, and social engagement [19,22]. It classifies cities into stages, from early technology implementation to advanced integration of smart solutions. In developing countries, this approach helps cities identify strategic priorities, focusing on infrastructure and regulatory frameworks to advance towards higher levels of smart city development [16,20]. By assessing a city's technological readiness and governance capacity, the maturity approach provides a roadmap for policy and infrastructure improvements. Early-stage cities might prioritize basic infrastructure such as internet access and urban sensors, while more advanced cities could focus on smart transportation systems and real-time data analytics [21].

This approach is particularly valuable for developing countries, as it highlights developmental gaps and enables cities to set incremental goals aligned with their current capabilities. Policymakers can use this framework to understand which policies or interventions are needed to transition from one stage to the next, such as strengthening governance structures or enhancing public-private partnerships.

Despite its benefits, the maturity approach faces challenges, particularly in developing regions, where financial and resource constraints, along with political instability, can slow progress. For this reason, the approach advocates a phased, long-term strategy, ensuring cities gradually build the foundations for a more advanced smart city ecosystem.

Ultimately, the maturity approach remains an essential tool for guiding sustainable and inclusive urban growth. By understanding where a city stands in its development cycle, urban managers can make more informed decisions, allowing for targeted interventions and tailored strategies that address both technological and social needs.

3.3 Data-driven Management Approach

The data-driven management approach leverages technologies such as big data, IoT, and sensors to collect and analyze real-time data, optimizing urban services like mobility, waste management, and energy consumption [23]. This approach enables cities to make informed and efficient decisions, adjusting operations dynamically to improve both service delivery and urban quality of life. In developing countries, data-driven systems present significant opportunities to enhance efficiency and transparency, addressing challenges such as congestion, pollution, and resource management [25].

By integrating real-time technologies, cities can optimize systems like traffic flow and energy use, becoming more responsive and adaptable [24]. This approach allows cities to bypass traditional urban management methods, streamlining processes and reducing inefficiencies. For example, real-time data on waste collection can optimize routes, lowering fuel costs, while smart meters can help reduce energy waste.

Despite its potential, technological infrastructure remains a key challenge in developing countries. The installation of sensors and data platforms requires substantial investment, and even where infrastructure exists, data processing capacity and skills gaps may limit effectiveness. Data privacy and security concerns also arise, particularly in regions with weak regulations, where there is a risk of data misuse or dependency on large technology firms.

Nevertheless, the benefits of data-driven management for improving urban efficiency, cost savings, and citizen engagement are substantial. It offers cities the ability to monitor and adjust their operations in real-time, fostering sustainable urban growth and better meeting the needs of the population [26]. While challenges remain, data-driven approaches represent a crucial step toward smarter, more responsive cities, especially in developing countries.

3.4 Innovation Ecosystem Approach

The innovation ecosystem approach, based on the Triple Helix model, emphasizes collaboration between government, industry, and academia to drive urban innovation. Over time, this model evolved into the Quadruple Helix, adding civil society as a crucial pillar, recognizing the role that citizens play in shaping city development [27]. By involving a broad spectrum of stakeholders, the model ensures that smart city solutions are not only technologically advanced but also aligned with the needs of the local population [29].

In developing countries, where technological and socio-economic barriers often exist, this approach is particularly important. Collaboration between sectors helps cities overcome challenges related to infrastructure, governance, and economic development. Governments provide regulatory support, industries offer technologies, academia supplies research, and civil society ensures inclusivity. Urban Living Labs (ULLs) exemplify this approach by engaging stakeholders—including citizens—in the testing and implementation of smart technologies, ensuring that innovations benefit all segments of the population, particularly the marginalized [28].

The innovation ecosystem approach operates on the principle that no single sector can address urban challenges alone. By fostering collaboration, it offers a holistic framework where each actor contributes unique capabilities to create sustainable and innovative solutions [30]. It also promotes the democratization of innovation, ensuring that citizens actively participate in the development of technologies that shape their cities.

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However, the approach's success depends on effective coordination among stakeholders, which can be hindered by institutional silos, misaligned incentives, or a lack of trust. Cities must therefore promote inclusive governance frameworks that encourage open communication and shared accountability.

This approach is justified by its ability to create locally relevant and adaptable solutions, ensuring that smart city initiatives in developing countries become catalysts for broader transformation, not isolated experiments. The emphasis on collaborative learning ensures that smart city technologies are not only cutting-edge but also socially relevant and scalable to diverse urban contexts.

The innovation ecosystem approach is vital for developing smart cities, particularly in developing regions where challenges demand a collective effort. By fostering cooperation between government, industry, academia, and civil society, cities can co-create solutions that are inclusive, innovative, and sustainable, ensuring that technologies address the real needs of the communities they serve.

3.5 Conscious and Inclusive Communities Approach

The Conscious and Inclusive Communities approach, proposed as an original contribution of this study, focuses on ensuring that smart city development does not exacerbate social inequalities but instead promotes inclusion and equity [3,5,6]. This approach emphasizes the importance of involving local communities in all phases of smart city projects, from planning and implementation to governance. In developing countries, where inequalities are often deeper, this approach ensures that smart technologies address the real needs of marginalized populations, fostering urban development that is inclusive, culturally aware, and socially sustainable [5,6,8].

While other approaches prioritize technology, innovation, and institutional maturity, the Conscious and Inclusive Communities framework centers on people and communities as the core of the urban development process. The premise is that technology alone cannot solve urban problems unless the needs, active participation, and inclusion of citizens are considered [7,9]. The approach aims to mitigate urban inequalities, particularly in developing contexts, where smart city solutions, if not designed inclusively, risk worsening social divides. This approach ensures that the benefits of smart development reach all sectors of the population, especially the most vulnerable communities, which are often ignored in urban transformation processes [4,7].

The Conscious and Inclusive Communities framework promotes equitable and participatory development by fostering platforms where citizens are not only recipients of technology but co-creators of solutions [6]. Conscious inclusion ensures that residents

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can express their needs, participate in decision-making, and ensure that urban development respects their interests, identities, and cultures [7,11]. Moreover, cities that empower their communities through active and conscious participation are more resilient to challenges such as social, economic, or environmental crises. This approach highlights the importance of aligning urban development with local realities, drawing on the knowledge and adaptability of communities to create solutions that truly reflect their needs [6,11].

The justification for this approach is grounded in the need to overcome criticisms of traditional smart cities, which often prioritize technological infrastructure and economic efficiency over social contexts or the needs of the population [10]. As noted by scholars, one of the key criticisms of traditional smart city projects is their tendency to focus on technology without addressing the human element of urban life [10]. The Conscious and Inclusive Communities approach responds to these critiques by ensuring that technological solutions promote equitable and participatory development, rather than exacerbating social inequalities.

In developing countries, where inclusion and equity are not optional but essential for the success of any smart city project [1], this approach ensures that smart cities improve the quality of life not just for the wealthiest or most connected sectors, but for all citizens. This is particularly important for the disadvantaged communities, which are often the most affected by technological changes if they are not involved in the process from the start. By embedding inclusion and equity as central pillars of smart city development, the Conscious and Inclusive Communities framework ensures that cities become more just and resilient.

Furthermore, this approach complements the other evaluation frameworks—Classification, Maturity, Data-Driven Management, and Innovation Ecosystems—by ensuring that smart city assessments also measure their social impact and their capacity to include all citizens, regardless of socio-economic status. While the other approaches offer useful models for measuring and managing smart cities, they do not explicitly address the critical issues of social equity and participation. The Conscious and Inclusive Communities framework fills this gap, providing a more holistic view of urban development that goes beyond technological innovation to focus on social well-being.

Finally, the Conscious and Inclusive Communities approach promotes a broader vision of smart cities. True urban intelligence does not only lie in technological efficiency but in a city's ability to create a just, inclusive, and resilient society. The success of a smart city should not be measured solely by its ability to innovate, but by its capacity to improve the lives of all its citizens, ensuring that no one is left behind. This approach calls for a more inclusive evaluation of smart city initiatives, where success is defined not just by innovation metrics but by the social, economic, and cultural progress of the entire population.

4 Discussion: Addressing the Research Gap through Conscious and Inclusive Communities

The introduction of the Conscious and Inclusive Communities approach as part of the evaluation framework for smart cities addresses a significant research gap that has been overlooked in traditional models of smart city development. While existing approaches prioritize technological advancement and economic growth, they often fail to adequately consider the social and cultural needs of local communities, particularly in developing countries [1,3,4,12]. This omission has sparked criticism from scholars such as Esashika [2], who argue that the focus on technology and economic metrics without sufficient attention to local social contexts can lead to disconnects between smart city projects and the very citizens they are designed to serve. Examples such as Masdar City and Songdo reveal how smart city initiatives that neglect community expectations create urban environments that, while technologically advanced, lack the engagement and social inclusivity needed to be truly successful [13,14].

In the context of developing countries, where social inequalities are more pronounced, the Conscious and Inclusive Communities approach becomes particularly critical. Ignoring the needs of marginalized populations in these regions can not only exacerbate existing disparities but also lead to the creation of smart cities that primarily benefit urban elites, leaving large segments of the population further behind [6,11]. Smart city projects that do not integrate inclusive decision-making processes risk perpetuating the very social and economic inequalities they seek to mitigate. This approach ensures that technological solutions are not only designed with the most vulnerable communities in mind but also implemented in ways that respect local cultural identities and needs. By placing communities at the heart of the decision-making process, this approach promotes social equity and ensures that all residents have a voice in the transformation of their urban environments.

One way to enhance this community-driven innovation is through the concept of ULLs, as outlined in the Quadruple Helix model. This model includes civil society as a core actor in the co-creation of smart city solutions, alongside government, academia, and industry [5,7]. However, the Conscious and Inclusive Communities approach goes beyond merely involving citizens in innovation; it advocates for their empowerment in problem definition and solution implementation. Rather than being passive participants, citizens become active co-creators, influencing the direction of urban development in ways that are conscious of cultural diversity and local realities. This approach acknowledges that solutions developed in isolation from community input are unlikely to address the most pressing needs of the population.

Moreover, this approach contributes to the broader goals of social sustainability and urban resilience. For a smart city to be truly sustainable, it must extend beyond technological and environmental dimensions to integrate social sustainability. This means creating urban environments where citizens are not just recipients of technology but

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active participants in shaping the future of their cities. By embedding communities in the decision-making process, cities can become more resilient, with greater capacity to adapt to social, economic, and environmental crises [4,9]. Community participation in decision-making fosters a sense of ownership and responsibility, which enhances the ability of cities to respond to challenges such as climate change or social unrest. Therefore, the Conscious and Inclusive Communities approach reinforces both sustainability and resilience, ensuring that urban transformations are not only driven by technology but also by the needs and aspirations of the people.

From a theoretical and methodological perspective, the Conscious and Inclusive Communities approach represents an evolution of traditional smart city evaluation models, which have historically focused on infrastructure, technology, and data [6,8]. While these models provide valuable insights into the maturity and innovation capacity of smart cities, they fail to explicitly address critical issues related to social inclusion, participation, and equity. The introduction of the Conscious and Inclusive Communities framework expands these existing models by incorporating indicators that measure a city's capacity to engage and include all residents in the development process. These indicators are essential for evaluating not only the technological sophistication of smart cities but also their ability to create inclusive, equitable, and participatory urban spaces.

Furthermore, this approach contributes to a more holistic understanding of what it means for a city to be "smart." While technology and innovation are important components of smart city development, they are not the only measures of success. A truly intelligent city is one that can create a just, inclusive, and resilient society. The Conscious and Inclusive Communities approach shifts the focus from purely technological metrics to a more comprehensive evaluation that considers the social well-being of all citizens. In this way, the success of a smart city is not only measured by its ability to innovate but also by its capacity to improve the lives of its most vulnerable populations and ensure that no one is left behind.

In conclusion, the Conscious and Inclusive Communities approach addresses a critical gap in the evaluation of smart cities by ensuring that social equity and inclusion are at the forefront of urban development. It challenges the traditional focus on technology and economic growth by advocating for a more people-centered approach that empowers communities, promotes social sustainability, and builds urban resilience [3,4,11]. This contribution provides a necessary complement to existing frameworks, offering a more inclusive lens through which to evaluate and develop smart cities, particularly in developing countries.

Conclusions

This paper contributes to the existing literature on smart city evaluations by proposing a more holistic and inclusive framework, particularly relevant for developing countries. While traditional approaches such as classification, maturity, data-driven management, and innovation ecosystems provide valuable insights into the technological and governance aspects of smart cities, they often fall short in addressing the social

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and cultural dimensions that are critical for sustainable urban transformation. The proposed Conscious and Inclusive Communities approach fills this gap by ensuring that smart city initiatives are equitable, participatory, and responsive to the real needs of local populations, particularly marginalized communities.

The Conscious and Inclusive Communities approach challenges the conventional focus on technology and economic growth by placing people and communities at the center of smart city development. It advocates for the active involvement of citizens in every stage of the urban transformation process, from planning to implementation and governance. This framework not only promotes social equity but also enhances urban resilience, as communities that are engaged and empowered are better equipped to adapt to social, economic, and environmental challenges.

Additionally, the integration of this approach with existing evaluation frameworks strengthens the overall assessment of smart cities. By incorporating indicators of social inclusion, participation, and equity, urban planners and policymakers can better measure the success of smart city projects in terms of their impact on society rather than just their technological advancements.

For policymakers and urban planners in developing countries, the recommendations outlined in this paper offer a roadmap for creating more inclusive and sustainable urban environments. By adopting a multidimensional approach that combines technological innovation with social responsibility, cities can ensure that smart city initiatives truly benefit all citizens, fostering a more just and resilient urban future.

In conclusion, the framework proposed in this paper provides a comprehensive tool for assessing smart cities in developing regions, ensuring that the pursuit of innovation does not leave any community behind. Future research and policy should continue to explore how inclusive practices can be integrated into the development of smart cities, particularly in regions where inequality and social exclusion are significant barriers to sustainable urban growth.

Disclosure of Interests. The authors have no competing interests to declare that are relevant to the content of this article.

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