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| Volume 6 | Issue 2 | June (2026) | DOI: 10.47540/ijias.v6i2.2743 | Page: 283 – 296 |
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## The proliferation of electronic public participation and the perpetual digital inequalities in South African regions

John Mamokhere

Department of Research Administration and Development, University of Limpopo, South Africa

**Corresponding Author:** John Mamokhere; Email: [johnm@uj.ac.za](mailto:johnm@uj.ac.za)

### ARTICLE INFO

**Keywords:** Digital Inclusion, Digital Inequalities, Digital Literacy, E-Participation, Inclusive Governance.

*Received* : 05 May 2026

*Revised* : 18 June 2026

*Accepted* : 30 June 2026

### ABSTRACT

The Fourth Industrial Revolution (4IR) has accelerated digital transformation, creating opportunities for governments to enhance efficiency, transparency, accountability, public participation, and service delivery through digital technologies. In South Africa, electronic public participation (e-participation) has emerged as a strategic mechanism for strengthening public participation in municipal governance and the Integrated Development Planning (IDP) process. However, persistent digital inequalities continue to undermine these opportunities, particularly in rural municipalities across Limpopo, the Eastern Cape, and KwaZulu-Natal. This study investigates the structural and socio-economic factors perpetuating digital inequalities and their implications for inclusive e-participation in rural South African regions. A qualitative research approach was adopted, using thematic content analysis to examine evidence from appropriate municipalities. The findings reveal that municipalities such as Mkatazo Village, Mbhashe, Amathole, OR Tambo, Vhembe, and uMkhanyakude continue to experience inadequate broadband infrastructure, unreliable electricity supply, outdated digital systems, high data costs, limited access to digital devices, low digital literacy, language barriers, weak institutional capacity, limited political support, and constrained financial resources. Gender and age disparities further exacerbate digital exclusion. The study concludes that e-participation cannot realise its transformative potential without addressing these structural barriers. It recommends sustained investment in digital infrastructure, affordable connectivity, community-based digital literacy programmes, inclusive and localised e-participation models, strengthened institutional capacity, and stronger political commitment to embed e-governance reforms within municipal operations, thereby promoting equitable, inclusive, and sustainable digital governance in the 4IR era.

### INTRODUCTION

The emergence of digital technologies has significantly transformed governance systems worldwide, enabling new forms of citizen engagement and participation (Sadat, 2025). In Africa, digital technologies are transforming governance and democratic participation, driven by a youthful, tech-savvy population increasingly disillusioned with traditional systems. This shift, termed digital democracy, empowers youth to engage through social media and digital platforms, challenging authoritarianism and fostering new political expressions. With over 495 million mobile service subscriptions and 50% smartphone adoption

in 2022 in Sub-Saharan Africa, these advancements offer unparalleled connectivity, making platforms like Twitter, Facebook, WhatsApp, and Instagram vital for political discourse among the 60% of the population who are youth (Dorling, 2021; GSMA Intelligence, 2021). However, this article focuses on e-participation, which is defined as the use of Information and Communication Technologies (ICTs) to facilitate public involvement in decision-making processes. It has gained prominence as a tool for enhancing transparency, accountability, public participation and democratic governance (Ayodele, Plantinga, Sanchez-Bentacourt, Dlamini & Dlamini, 2025; Firtin, Akyuz, Bilbil & Karkin,

2025). In South Africa, digital governance initiatives have been integrated into broader public sector reforms aimed at improving service delivery and citizen engagement. However, the benefits of digital transformation remain unevenly distributed. The concept of the digital divide highlights disparities in access to, use of, and benefits derived from digital technologies (Muwani, Ranganai, Zivanai & Munyoro, 2022). In the South African context, these disparities are particularly evident in rural areas, where infrastructural deficits, structural inequalities, socio-economic inequalities, and historical marginalisation continue to shape access to ICTs (Mwansa, Ngandu & Mkwambi, 2025).

Empirical evidence suggests that while urban populations increasingly benefit from high-speed internet and digital services, rural communities face significant barriers to digital inclusion (Mwansa et al., 2025). For instance, Gillwald and Mothobi (2019) found that mobile data costs in South Africa remain among the highest in Africa relative to income, disproportionately affecting low-income rural households. Similarly, Chisango and Marongwe (2021) and Zindi (2024) observed that limited broadband infrastructure in rural provinces such as Limpopo and the Eastern Cape restricts access to digital platforms necessary for e-participation. Shiferaw (2024) examined gender disparities in accessing and utilising ICTs in South Africa. The study revealed that men use the internet more frequently than women, with a notable gender gap in mobile phone ownership and internet access. In 2011, 66.8% of men used the internet at work compared to 33.2% of women, with similar discrepancies observed in home and mobile usage. Despite the transformative potential of digital technologies, their impact remains uneven, often reinforcing existing inequalities and hindering progress in development pathways. This article provides a comprehensive synthesis of the literature on e-participation and the digital divide in rural South Africa. Moreover, the purpose of the study is to explore the emergence and proliferation of e-participation and the perpetual digital divide in rural South African regions.

Despite policy assurances for inclusive digital governance, rural communities in South Africa continue to face significant barriers to digital participation. Programs aimed at expanding broadband access and enhancing e-government

services have shown limited effectiveness in rural areas. Nearly 50% of rural residents in certain regions do not have reliable internet access, exacerbating existing inequalities. Although the government's SA Connect Phase 2 initiative aspires to achieve universal broadband access by 2026, the implementation remains inconsistent, predominantly benefiting urban centres with advanced 5G coverage, while rural regions often rely on outdated or inadequate infrastructure (Department of Communications & Digital Technologies, 2023). For instance, "In 2022, the Cabinet approved a revised model for SA Connect Phase 2 aimed at enhancing broadband infrastructure nationwide. The primary goal is to ensure 100% broadband access for all communities and government facilities within 36 months, targeting a minimum speed of 5 Mbps for households and 10 Mbps for government entities, such as public schools and health facilities. The implementation involves several key interventions: connecting communities and households, improving connectivity for government facilities, and adhering to Universal Service Obligations" (Department of Communications & Digital Technologies, 2023).

Studies indicate that digital exclusion in rural areas is driven by multiple intersecting factors, including lack of infrastructure, high costs of connectivity, and limited digital literacy (Gillwald & Mothobi, 2019; Chisango et al., 2021). For example, a study conducted in KwaZulu-Natal by Sibiya, Chuma and Jacobs (2025) revealed that several areas in KwaZulu-Natal (KZN) are rural communities that are significantly affected by the digital divide, characterised by limited access to digital and ICT infrastructure. As per the KZN transformation strategy 2020–2025, KZN ranks among the provinces with the highest digital disparities, with 62% of internet access in the province concentrated in urban households, leaving rural areas with inadequate connectivity. This lack of infrastructure forces many rural residents, particularly the unemployed and those outside educational institutions, to rely on internet cafés and educational facilities, thereby exacerbating their digital exclusion. The study investigated the perceptions of post-metric youth in two rural communities, Mbazwana and Mtubatuba, regarding their access to digital tools, the barriers to digital literacy, and the skills fostered through a computer

literacy program. These communities show an absolute absence of ICT resources in secondary schools, resulting in a generation of computer-illiterate youth who struggle to access education and employment opportunities. KZN's challenges with digital accessibility hinder socio-economic development, as highlighted in the KZN transformation strategy and corroborated by reports indicating that over 60% of the rural population lacks reliable internet access, limiting their engagement with digital platforms compared to urban residents (Sibiya et al., 2025). Furthermore, existing e-participation platforms often fail to account for local socio-cultural and linguistic contexts, thereby excluding significant segments of the population (Wirtz, Daiser & Binkowska, 2023). This raises critical concerns about democratic inclusivity and the effectiveness of digital governance initiatives in rural South Africa. National Planning Commission (2022) posits that low digital literacy, language barriers, and limited access to ICT services hinder community participation in the digital economy. The National Planning Commission's review highlights ongoing inequality, unemployment, and poverty as challenges in South Africa, indicating that a fully ICT-enabling environment is lacking. Mwansa et al. (2025) offer a practical solution by indicating that collaboration with community elders and influencers is essential for the culturally sensitive introduction of digital tools, such as aligning mobile apps with indigenous farming calendars and incorporating local languages into training and public participation. Digital extension services delivered through community centres and cooperatives can improve outreach and make technology adoption more relevant. For sustainable progress, community-led maintenance funds should be established for digital infrastructure, alongside local technician training to reduce reliance on external providers. Thus, the article provides a comprehensive synthesis of the literature on the digital divide and e-participation in rural South Africa.

This study aims to explore the emergence and proliferation of electronic public participation and the perpetual digital inequalities in South African regions. Specifically, the objectives of this study are to conceptualise and contextualise e-participation and the digital divide within South Africa and

developing regions; to examine the dimensions of the digital divide within rural contexts; to identify barriers associated with e-participation and the digital divide, and their impact on the attainment of relevant SDGs; and to explore enabling factors contributing to the digital divide in South Africa.

## **METHODS**

This study adopted a qualitative research methodology using a literature review design supported by qualitative thematic content analysis to examine the emergence of e-participation in South Africa and the persistent digital divide affecting rural municipalities. A qualitative methodology was considered appropriate because the study sought to explore meanings, patterns, policy debates, institutional challenges, and socio-economic realities associated with digital exclusion rather than measure variables statistically. The literature review design enabled the systematic identification, evaluation, and synthesis of existing scholarly and policy-based knowledge on the topic, while the thematic content analysis provided a structured method for interpreting recurring themes and concepts across selected sources. This combined design was suitable because the subject of the digital divide and e-participation is widely documented in secondary sources, allowing for in-depth analysis without the financial and logistical constraints associated with primary fieldwork.

### **Data Collection and Retrieval Process**

The study utilised secondary data from a variety of credible sources, including peer-reviewed journals, books, conference papers, government reports, and institutional publications, collected between February 2023 and April 2026 for a doctoral degree. Relevant literature was identified through comprehensive keyword searches encompassing terms like digital divide, digital technologies, e-participation, rural municipalities, digital literacy, and inequalities, conducted across academic databases such as Google Scholar, ScienceDirect, PubMed Central, and more. This approach aimed to enhance access to interdisciplinary studies and minimise selection bias through a method called keyword triangulation, which included a diverse range of search terms and Boolean operators (AND, OR, NOT) to broaden the evidence base. Sources were meticulously selected based on their relevance, authors' credibility,

methodological soundness, and focus on South Africa or similar developing contexts, prioritising peer-reviewed materials. Triangulation further verified findings across various sources, reinforcing the review's reliability and impartiality.

#### **Data Analysis Process**

The qualitative thematic content analysis process utilised in the study comprises six interrelated steps aimed at understanding the digital divide and e-participation in South Africa. Initially, during the familiarisation stage, various sources, including journal articles and policy documents, were repeatedly examined to grasp the content and context comprehensively, which helped identify preliminary patterns. The second step, coding, involved pinpointing significant words and concepts related to the study's objectives. This led to the categorisation of data into recurrent issues such as infrastructure deficits, affordability constraints, and digital literacy gaps. Next, in generating themes, similar codes were organised into broader categories that represented major aspects of digital exclusion and e-participation, grouping codes reflecting weak broadband access and electricity shortages under infrastructure barriers and associating high data costs and poverty with affordability constraints. The reviewing themes stage followed, where the themes were evaluated for their fidelity to the coded data and broader literature, allowing for necessary adjustments to enhance coherence and clarity. In defining and naming themes, clear descriptions and concise titles were assigned to each theme, encapsulating its essential contribution. Finally, during the writing-up stage, the validated themes were presented narratively and critically interpreted using supporting literature to elucidate how structural and systemic factors impact digital exclusion and e-participation in South Africa.

#### **Trustworthiness and Credibility of the Study**

The trustworthiness and credibility of the findings were enhanced through the use of multiple credible data sources, transparent search procedures, consistent inclusion criteria, and systematic thematic analysis. Dependability was supported by documenting the search strategy, keywords, databases used, and analytical steps followed. Confirmability was strengthened through reliance on published evidence rather than personal assumptions, while transferability was supported by

linking findings to broader governance and development contexts relevant to similar rural municipalities.

#### **Ethical Consideration**

As a literature review study, commonly known as a desktop study, there was no need for formal ethical clearance due to the absence of human or animal participants. Nevertheless, ethical standards were upheld through accurate citation of sources, avoidance of plagiarism, fair representation of authors' views, and a commitment to objective and evidence-based interpretations. Intellectual property rights were honoured by recognising all original contributions.

#### **RESULTS AND DISCUSSION**

This study reveals the following themes as the main findings: Digital infrastructure and connectivity inequalities; Affordability and socio-economic exclusion; Limited resources, institutional capacity, and policy implementation gap; Gender and age digital inequalities; Digital literacy as a prerequisite for meaningful participation; Language barriers, lack of trust, and citizen engagement; and Uneven effectiveness of e-participation.

Thus, the findings are drawn entirely from secondary sources, potentially dominating lived experiences, emerging local dynamics, or context-dependent variations that could be captured via primary empirical research. Nonetheless, the chosen design remains suitable as the issues surrounding the digital divide and e-participation are well-documented across scholarly and institutional literature. Future research will adopt mixed methods approaches that incorporate both qualitative and quantitative techniques, along with empirical data collection, to yield more comprehensive findings. Based on the findings, five key recommendations are proposed for rural municipalities: (1) accelerate investment in broadband infrastructure and reliable electricity supply to ensure universal connectivity; (2) implement subsidised or low-cost data and device access schemes to improve affordability for low-income households; (3) strengthen continuous digital literacy and ICT training programmes for both citizens and municipal officials, with targeted support for older populations and disadvantaged groups; (4) develop multilingual, accessible, and user-friendly e-participation platforms to address language and inclusivity barriers; and (5) enhance

political will, leadership accountability, and system integration by ensuring coordinated e-governance strategies, updated digital systems, and meaningful citizen engagement throughout planning and decision-making processes.

### **Theoretical Framework**

Relative Deprivation Theory was primarily developed by Samuel A. Stouffer in 1949 in the study *The American Soldier*, where they examined how individuals evaluated their conditions by comparing themselves with others rather than by absolute standards. The theory was later expanded by scholars such as Walter G. Runciman (1966), who formalised the concept in social inequality research. The central premise of the theory is that people experience feelings of deprivation, dissatisfaction, frustration, or exclusion when they perceive themselves as worse off than other individuals or groups to whom they compare themselves, even when their basic conditions may have improved. Thus, deprivation is relative rather than absolute, emerging from unequal opportunities, access to resources, recognition, or participation. The purpose of the theory is to explain social discontent, perceptions of inequality, collective action, protest behaviour, reduced trust in institutions, and demands for social justice. It is widely used in sociology, political science, public administration, and development studies to understand how inequalities shape citizen attitudes and behaviour (Tshabane, 2023).

Relative Deprivation Theory aligns strongly with this study on e-participation, public participation in municipal affairs, and the digital divide in South African rural municipalities because many rural residents may perceive themselves as excluded when comparing their conditions with urban communities that enjoy reliable internet, digital devices, online municipal services, and faster access to information (Tshabane, 2023; Nomzaza, 2025). While municipalities increasingly adopt digital platforms for integrated development plan consultations, complaints systems, and service communication, rural citizens often face poor connectivity, high data costs, limited digital literacy, language barriers, and weak infrastructure. This creates a sense of relative deprivation because these communities recognise that others have greater opportunities to participate in governance and access services. Such exclusion may reduce

trust in municipalities, discourage participation in local affairs, intensify perceptions of marginalisation, and widen rural–urban inequalities (Shava & Ndebele, 2023). At the same time, the theory helps explain why communities may demand improved infrastructure, inclusive consultation methods, and equitable digital policies. Therefore, the Relative Deprivation Theory provides a useful lens for analysing how unequal digital access translates into democratic exclusion and weak participatory governance in South Africa’s rural municipalities.

### **Conceptualisation and Contextualisation of E-Participation and Digital Divide in South Africa**

E-participation, also known as electronic public participation, has gained global traction as governments integrate it into e-government frameworks to utilise ICTs for engaging citizens in governance processes such as policy formulation, decision-making, and service design. As a component of public participation, it promotes inclusivity and broader engagement, particularly in developing contexts like South Africa, where it extends beyond information dissemination (Le Blanc, 2020; Tshabane, 2023; Mariani, Mortati, Rizzo & Deserti, 2024). Peixoto and Fox (2016) describe e-participation as a collaborative process involving public institutions, citizens, and political actors aimed at enhancing transparency, accountability, responsiveness, and policy quality, while fostering inclusive societies and strengthening trust in government. From a technological perspective, it supports digital governance and plays a critical role in integrated development planning by enabling collaboration across planning, implementation, and evaluation stages (World Bank, 2012; Mamokhere & Meyer, 2022). In South Africa, e-participation is advancing as part of digital transformation and aligns with governance principles that prioritise citizen-centred service delivery, complementing traditional participation methods such as public meetings (Koena & Mokoele, 2025).

However, its effectiveness is constrained by the digital divide, defined as unequal access to digital technologies and skills across demographic groups and regions (Taylor, 2023). While the internet initially raised expectations for enhanced civic engagement, it has also reinforced socio-economic inequalities, particularly as lower-income

groups face financial barriers to adoption (Frey, Baldassarri, & Billari, 2024). This divide is rooted in historical inequalities, unemployment, poverty, and limited public participation, which hinder digital inclusion (Moleko, 2022). Rural–urban disparities remain significant, with development initiatives often favouring urban areas, resulting in limited access to internet infrastructure, municipal information, and digital services in rural communities (Moleko, 2022; Choung & Manamela, 2018). Thus, rural populations rely on shared public facilities such as libraries and clinics for connectivity. This urban bias contributes to unequal participation, as e-participation may privilege technologically advantaged groups, leading to

biased planning outcomes and reinforcing inequalities among marginalised and previously disadvantaged communities (Foster, 2019).

#### **Understanding the dimensions of the digital divide within the rural context**

According to Shiferaw (2024), the phrase “digital divide” may mean different things to different individuals. Around 1995, this phrase entered the researchers' lexicon. Since then, there has been an increasing interest in studying the digital divide. In this study, it refers to the unequal distribution of people's access to and utilisation of ICT across gender, ethnicity, and socioeconomic status. Table 1 illustrates the various dimensions of the digital divide within a rural context.

Table 1. Dimensions of the digital divide

| Dimensions                                  | Articulation                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sources                                                                               |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1. Infrastructure and Connectivity Divide   | Rural areas experience inadequate digital infrastructure characterised by limited broadband rollout, absence of fibre networks, weak and inconsistent mobile coverage, and insufficient public ICT access points (e.g., telecentres, community Wi-Fi). These challenges are compounded by unreliable electricity supply, resulting in unstable and intermittent connectivity that constrains access to digital services and virtual meetings. | (Mwansa, Ngandu & Mkwambi, 2025; Dlamini et al., 2025; Enaifoghe, 2025; Zindie, 2024) |
| 2. Affordability and Economic Access Divide | The high cost of mobile data, internet services, and digital devices relative to low household incomes significantly limits digital inclusion. Even where infrastructure exists, many rural residents are unable to afford sustained access, resulting in “access without meaningful use.” This dimension reflects broader socio-economic inequalities shaping digital participation.                                                         | (Mwansa et al., 2025; Dlamini et al., 2025; Zindi, 2024)                              |
| 3. Material Access Divide                   | Access to appropriate digital devices remains uneven, with many rural households lacking computers or relying on low-end smartphones with limited functionality. Device-sharing practices and lack of access to essential ICT tools restrict engagement with advanced services such as e-learning, e-health, and e-government platforms.                                                                                                      | (Mwansa et al., 2025; Enaifoghe, 2025)                                                |
| 4. Digital Skills and Literacy Divide       | A significant proportion of rural populations lack the necessary digital skills to effectively use ICTs. This includes basic operational skills, information literacy, and the ability to engage with online services. Limited access to training opportunities and weak integration of ICT education exacerbate this divide, resulting in dependence on intermediaries for digital engagement.                                               | (Mwansa et al., 2025; Enaifoghe, 2025; Dlamini et al., 2025)                          |
| 5. Geographic and Spatial Inequality Divide | Rural spatial isolation increases the cost and complexity of infrastructure deployment, resulting in uneven service provision compared to urban areas. Residents frequently travel long distances to access digital services, reinforcing spatial exclusion and perpetuating rural–urban disparities.                                                                                                                                         | (Mwansa et al., 2025; Dlamini et al., 2025)                                           |

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|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 6. Institutional, Policy, and Governance Divide     | Weak institutional capacity, fragmented policy implementation, and limited coordination hinder the effective rollout of digital initiatives (e.g., broadband strategies and e-government platforms). Municipalities often lack technical expertise and resources to implement inclusive digital governance systems, constraining service delivery and public participation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (Dlamini et al., 2025; Zindi, 2024)                                       |
| 7. Socio-economic and Demographic Inequality Divide | Structural inequalities such as poverty, unemployment, low education levels, and social marginalisation shape digital exclusion. Vulnerable groups, including women, youth, and rural poor populations, face compounded barriers to access, skills acquisition, and meaningful digital participation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | (Mwansa et al., 2025; Enaifoghe, 2025)                                    |
| 8. Language and Culture Divide                      | Digital literacy programs should tackle language barriers and cultural sensitivity by providing resources in various languages. Digital literacy, defined as a range of competencies, enables individuals to handle and create information using technology. South Africa's National Digital and Future Skills Strategy (2020–2025) highlights its significance for economic participation, social inclusion, and democratic engagement, promoting strategies that respect local languages, cultural diversity, and socio-economic disparities.                                                                                                                                                                                                                                                                                                                                                                            | (Enaifoghe, 2025)                                                         |
| 9. Gender and Age Divide                            | South Africa shows substantial gender and age disparities in economic participation, with women and youth facing lower employment rates. As of Q2 2025, the female labour force participation rate was 54.9%, versus 65.6% for men, while over 50% of youth aged 18-34 were not engaged in employment, education, or training. Shiferaw (2024) noted that men utilise ICTs more than women, despite a narrowing gap in cell phone ownership. The gender digital divide persists, with significant differences in internet access and usage; for instance, in 2011, 66.8% of men and only 33.2% of women accessed the internet at work. This digital inequality exacerbates existing gender disparities, highlighting the need for more research on how digital technology impacts structural gender inequalities. Older adults are more vulnerable to the digital divide, which is associated with psychological distress. | (StatsSA. 2025; Shiferaw, 2024; Gwala & Mawela, 2024; Zhong & Wang, 2025) |

The digital divide in rural contexts is multidimensional and reflects interconnected structural inequalities that constrain meaningful participation in digital society. A primary dimension is the infrastructure and connectivity divide, where rural areas experience weak broadband networks, limited fibre rollout, poor mobile coverage, few public ICT facilities, and unreliable electricity supply, as evident in Mkatzo village, Amathole District Municipality, and uMkhanyakude District Municipality (Mwansa et al., 2025; Enaifoghe, 2025). Closely linked is the affordability and economic access divide, where many households cannot afford devices, internet

subscriptions, or high data costs, resulting in “access without use,” particularly in Mkatzo, OR Tambo, and uMkhanyakude (Mwansa et al., 2025; Zindi, 2024). Material access constraints further limit engagement, as households rely on shared or low-end devices, restricting participation in e-learning, e-health, and e-government services in areas such as Vhembe and Amathole (Dlamini et al., 2025; Mwansa et al., 2025). The digital skills divide remains critical, driven by low education levels, inadequate ICT training, and limited exposure to digital tools, as observed in Mbhashe Local Municipality (Mwansa et al., 2025). This contributes to a usage divide, where digital tools are

primarily used for communication rather than for productive activities such as entrepreneurship or civic engagement. Geographic inequality further reinforces exclusion, as remoteness and dispersed settlements increase access costs and travel distances in areas like OR Tambo and uMkhanyakude (Zindi, 2024). Institutional and governance challenges also persist, with municipalities lacking capacity, funding, and coordination to implement inclusive digital systems, as seen in OR Tambo and Vhembe (Dlamini et al., 2025). Broader socio-economic inequalities, including poverty, unemployment, age, and gender, deepen exclusion among vulnerable populations (Khoza, 2023; Enaifoghe, 2025). Additional divides include limited access to ICT-enabled education, weak e-government and e-participation due to low access and skills, and persistent quality and reliability issues such as slow speeds and network disruptions. Rural areas are also excluded from emerging technologies, reinforcing future inequalities (Khoza, 2023; Mwansa et al., 2025). Digital literacy remains a significant challenge, particularly where language barriers exist, requiring culturally sensitive and multilingual interventions (Enaifoghe, 2025). In South Africa, the National Digital and Future Skills Strategy (2020–2025) adopts a holistic approach, recognising digital literacy as essential for economic participation, social inclusion, and democratic engagement. Furthermore, South Africa faces pronounced gender and age disparities. Women's labour force participation was 54.9% compared to 65.6% for men in Q2 2025, while over half of youth aged 18–34 are not in employment, education, or training (StatsSA, 2025). Gender inequalities in ICT access persist, with some municipalities recording gaps exceeding 30%, and historical data showing a 45.4% gap in home internet access (72.7% for men vs. 27.3% for women) (Shiferaw, 2024). Older adults are also highly excluded, with only 3.6% online in South Africa (Gwala & Mawela, 2024), compared to about 18% of those aged 65+ not using the internet in the United Kingdom (Zhongo & Wang, 2025). These intersecting inequalities highlight the need for targeted interventions to address persistent digital exclusion across gender and age groups.

### **Barriers Associated With E-Participation and the Digital Divide, and Their Impact on the Attainment of Relevant Sustainable Development Goals**

In today's rapidly changing technological landscape, citizens expect prompt solutions to their problems, yet government inefficiency is often linked to the inadequate implementation of e-government initiatives intended to enhance public participation in matters affecting citizens. In South Africa, e-government is used to increase participation by ordinary people in service delivery issues with the aim of reducing service delivery protests that disrupt economic and social activities (Tshabane, 2023). Municipalities are required by the Municipal Systems Act (2000) to promote public participation in the IDP process, while the White Paper on Local Government (1998) emphasises participation for developmental purposes (Enwereji & Uwizeyimana, 2020). The COVID-19 pandemic exposed the limitations of traditional public engagement tools such as public meetings and ward committees, leading municipalities to increasingly adopt e-participation as an alternative mechanism for citizens to voice concerns and shape development priorities (Mamokhere & Meyer, 2022). E-participation offers benefits such as increased accessibility, convenience, cost-effectiveness, broader reach, and improved data collection for informed decision-making (Van der Walddt, 2023; Qina, 2015). It can also promote inclusivity, transparency, efficiency, accountability, and responsiveness in governance, while empowering citizens through informing, consulting, involving, and collaborating processes (Zindi, 2024). However, e-participation should be complemented rather than replace face-to-face participation, particularly in rural municipalities where community engagement remains essential.

Despite its potential, e-participation in South Africa faces major digital divide challenges, especially in rural areas. These include limited access to technology such as smartphones, computers, tablets, stable internet connectivity, and electricity, making it difficult for many citizens to participate in online consultations or submit feedback on development plans (Nodzak, 2015; Shahab, Bagheri & Potts, 2021). High internet costs, limited financial resources, inefficient ICT research and development, and poor infrastructure

further deepen exclusion (Qina, 2015). Lack of digital and technical literacy is another major barrier, as many residents do not possess the skills required to engage effectively with e-participation platforms, resulting in weak community influence over municipal decisions (Jetho, 2019; Moleko, 2022). Socio-economic inequalities, poverty, unemployment, age, gender, and education disparities further widen the divide, with higher-income groups enjoying better access to technologies than low-income communities (Bennett, 2015; Moleko, 2022). Language barriers also remain significant in a multilingual country such as South Africa, where many e-participation platforms operate mainly in English and fail to accommodate indigenous languages, thereby excluding rural populations from meaningful engagement (Sibanda & Lues, 2019). The study argues that there are other concerns, including a lack of geographical boundaries, which may create uncoordinated planning, a lack of trust, and confusion where no clear framework exists for participation. If these challenges are addressed through cooperation, capacity-building, localisation, and blended traditional and e-participation methods, e-participation can strengthen democracy, transparency, accountability, and sustainable development (Rowe & Frewer, 2005; Foster, 2019; Shava & Doorgapersad, 2022).

Enaifoghe (2025) identifies multiple, interrelated digital divide challenges within South Africa's public sector, including unequal access to ICT infrastructure, particularly in rural and under-resourced areas where connectivity, hardware, and software remain inadequate. Significant digital literacy gaps persist across age groups, locations, and departments, with older employees often lacking formal ICT training, while younger staff possess stronger technical skills but limited institutional experience. These disparities are exacerbated by inconsistent and underfunded training programmes, resistance to change, weak leadership support, and fears associated with technology. Language barriers, lack of accessibility for people with disabilities, and absence of user-friendly multilingual platforms restrict inclusive participation and effective service delivery (Enaifoghe, 2025). Similarly, Ntika and Chigona (2024) highlight interconnected challenges affecting e-participation and the uptake of digital government

services. Lack of trust also emerges as a critical concern, driven by cybersecurity risks, privacy issues, and reluctance to share personal information online. Furthermore, limited citizen involvement in the design of digital platforms, often shaped by top-down approaches, results in systems that do not adequately reflect public needs, particularly those of marginalised groups. Political will, poor system integration, budget limitations, outdated online information, and cultural issues further undermine adoption (Ntika & Chigona, 2024). Together, these challenges constrain e-participation, reduce utilisation of digital services, and reinforce existing inequalities.

### **Impact of E-participation and Digital Divide on the Attainment of Relevant Sustainable Development Goals**

According to Zindi and Ndhlovu (2024), there are positive impacts of digital technologies in Africa, including accelerating progress toward sustainable development through improved productivity, inclusion, and service delivery. Digital tools such as artificial intelligence (AI), robotics, the Internet of Things (IoT), mobile banking, and digital platforms can reduce poverty by expanding financial inclusion. For example, Kenya's M-Pesa enabled millions of previously unbanked people to access banking services, savings, loans, and secure transactions, helping lift households out of extreme poverty. Digital finance platforms like Hello Paisa also reduce remittance costs and support low-income and migrant communities. In agriculture, technologies such as Hello Tractor connect farmers to mechanised services, while Aerobatics uses drones and AI to monitor crops, improve yields, optimise irrigation, and strengthen food security. The article further notes that digital technologies support innovation and industrial growth through firms like Flutterwave, which enables safe payments, SME growth, job creation, and cross-border trade. In transport at Uganda, platforms such as SafeBoda improve urban mobility, commuter safety, and driver incomes. For environmental sustainability, digital systems such as the Western Cape Industrial Symbiosis Programme help businesses exchange waste materials and reuse resources, reducing landfill waste and promoting a circular economy. Zindi and Ndhlovu (2024) are confident that digitalisation can help eliminate hunger, reduce poverty and inequality, promote

innovation, improve infrastructure, and advance responsible consumption and production across Africa.

In contrast, digital technologies and digital divide challenges significantly undermine the attainment of relevant SDGs by excluding vulnerable communities from opportunities, services, and decision-making processes. In relation to SDG 1 (No Poverty), limited access to digital infrastructure, high internet costs, low digital literacy, and a lack of devices prevent poor households from accessing online job opportunities, social grants, business support programmes, financial services, and skills development initiatives that could improve livelihoods. Rural communities, therefore, remain trapped in cycles of poverty and economic exclusion. Regarding SDG 2 (Zero Hunger), the digital divide restricts access to agricultural information, market prices, climate updates, food support programmes, and online extension services that are essential for small-scale farmers and food-insecure households. Without digital access, many rural producers struggle to improve productivity, market participation, and food security (Hariyani, Hariyani & Mishra, 2025). These barriers also weaken progress towards SDG 10 (Reduced Inequalities) because unequal access to ICTs reinforces existing disparities between urban and rural areas, rich and poor households, educated and less-educated citizens, as well as younger and older populations. Communities already marginalised by poverty, geography, disability, or language are further excluded from digital participation, public services, and economic opportunities. In terms of SDG 11 (Sustainable Cities and Communities), ineffective e-participation prevents citizens from contributing meaningfully to municipal planning, service delivery decisions, and local governance (O'Sullivan, Clark, Marshall & MacLachlan, 2021; Nirmani, 2025). When residents cannot engage digitally due to poor connectivity, language barriers, or a lack of skills, municipalities lose valuable community input needed for inclusive, safe, resilient, and sustainable settlements. This can lead to poor planning decisions, service delivery protests, weak accountability, and communities that do not reflect the real needs of residents.

### **Enabling factors contributing to the digital divide in South Africa**

The digital divide in South Africa, particularly in rural areas, is driven by a combination of structural, socio-economic, and governance-related factors. A major contributor is the unequal distribution of digital infrastructure, with many rural municipalities still grappling with weak broadband networks, unreliable electricity, a lack of fibre connectivity, and limited access to devices. In areas such as Mkatazo village, residents face limited ICT infrastructure, no fibre connectivity, and high data costs, leaving more than half the population without internet access (Mwansa et al., 2025). Similarly, Amathole District Municipality experiences unreliable electricity, limited computer ownership, and inadequate ICT resources, which deepen digital exclusion. High poverty and unemployment levels further exacerbate the divide, as many households cannot afford smartphones, laptops, or recurring mobile data costs. This is also evident in the UMkhanyakude District Municipality, where communities depend on expensive mobile data and poor-quality network coverage (Enaifoghe, 2025). As highlighted in the previous articles, limited internet access and underdeveloped ICT infrastructure remain key barriers to digital transformation and hinder progress towards inclusive development goals such as poverty reduction, quality education, and innovation (Zindi & Ndhlovu, 2024). Another enabling factor of the digital divide is weak governance capacity, low digital literacy, and inadequate political commitment to inclusive digital participation. Many municipalities struggle with outdated websites, poor integration of government systems, inadequate budgets, and insufficient management support, which reduce the usefulness of e-participation platforms (Ntika & Chigona, 2024). In the Mbhashe Local Municipality, high poverty levels and low educational attainment have resulted in weak digital skills and limited use of online public services (Mwansa et al., 2025). In the OR Tambo District Municipality, weak broadband infrastructure and affordability constraints continue to limit access to digital governance services (Zindi, 2024). Likewise, rural communities in Vhembe District Municipality face low incomes, a lack of devices, and poor digital literacy, which undermine e-participation efforts (Dlamini et al., 2023).

Leadership challenges, top-down planning approaches, and a lack of monitoring and evaluation also weaken citizen engagement and accountability in municipalities (Shahab et al., 2021). Together, these factors reinforce rural–urban inequalities, reduce citizen participation, and slow South Africa’s efforts to bridge the digital divide. The digital divide compounds the lack of service delivery to poor communities.

In discussion, the findings reveal that digital exclusion in South Africa is multidimensional, driven by structural inequality, policy implementation gaps, and digital skills deficits. While e-participation is promoted as a mechanism to enhance public engagement in integrated development planning, its effectiveness remains uneven across municipalities. It improves accessibility, convenience, and cost-effectiveness by enabling participation from homes or workplaces (Van der Walddt, 2023; Qina, 2015), a shift that became essential during the COVID-19 pandemic when municipalities adopted digital platforms (Mamokhere & Meyer, 2022). However, urban municipalities adapted more effectively than rural ones, where poor broadband coverage, unstable electricity, and limited device access remain persistent barriers. Provinces such as Limpopo and Eastern Cape continue to experience weak connectivity, limiting participation in online municipal processes (Chisango et al., 2021). This uneven distribution reinforces existing inequalities rather than alleviating them, supporting the argument that digital exclusion involves not only access but also the capabilities required for meaningful participation (O’Sullivan et al., 2021). Affordability further constrains inclusion. Although digital platforms expand theoretical access, high data costs prevent sustained participation among low-income households. Evidence shows that poorer households spend a disproportionate share of their income on mobile data, making digital governance costly (Gillwald & Mothobi, 2019). Thus, connectivity without affordability provides limited inclusion. By contrast, countries such as China and Bangladesh have leveraged e-governance to reduce rural–urban disparities (O’Sullivan et al., 2021), highlighting that South Africa’s slower progress reflects policy implementation challenges rather than technological limitations.

In many cases, municipalities introduce platforms without addressing socio-economic barriers, resulting in low uptake, as seen in KwaZulu-Natal (Okeke-Uzodike & Dlamini, 2019). The findings also underline significant gender and age disparities. Women’s labour force participation remains lower than men’s (54.9% vs. 65.6% in Q2 2025), accompanied by a pronounced gender digital divide (StatsSA, 2025). Men have significantly higher internet access rates, with some municipalities recording household gaps exceeding 30%. Older adults are particularly excluded, with only 3.6% using the internet due to affordability, low digital literacy, and physical limitations. These intersecting inequalities deepen exclusion, especially in rural areas, and restrict access to employment, education, healthcare, and government services (Gwala & Mawela, 2024; Shiferaw, 2024). Digital literacy emerges as a critical determinant of effective participation. Many citizens, particularly in rural and township contexts, lack the skills required to navigate digital platforms (Jetho, 2019; Moleko, 2022). South Africa’s relatively low digital literacy ranking reflects broader educational and socio-economic disparities. Importantly, digital literacy extends beyond basic technical skills to include information evaluation, online communication, privacy protection, and informed decision-making. Without these competencies, digital systems risk becoming symbolic rather than transformative. Language and trust further shape e-participation outcomes. Platforms designed primarily in English may exclude non-English speakers in a multilingual society (Sibanda & Lues, 2019), while technical jargon discourages engagement. Additionally, concerns about misinformation, cybercrime, and limited responsiveness undermine trust in digital systems (Ntika & Chigona, 2024). Where municipalities fail to provide feedback, participation risks becoming tokenistic (Mamokhere & Meyer, 2022). Many challenges constrain the potential of e-participation. While frameworks such as the Municipal Systems Act (2000) promote inclusive governance, implementation remains inconsistent.

## **CONCLUSION**

In conclusion, the study reveals that the digital divide in South Africa’s rural municipalities is fundamentally structural and systemic. It is

influenced by interlinked factors, including inadequate ICT infrastructure, high data costs, weak institutional capacity, limited digital literacy, language exclusion, and inadequate political and managerial support. These barriers hinder effective e-participation and inclusive governance, exacerbating rural–urban inequalities and undermining the potential of digital government services. Such digital exclusion transcends mere technical challenges, posing broader socio-economic and governance challenges that impact service delivery, civic participation, and the achievement of sustainable development goals. The implications of these findings are critical for policymakers, indicating that current digital transformation strategies may inadvertently exacerbate inequalities unless they are aligned with local realities and SDGs attainment. Therefore, municipalities are encouraged to exceed top-down digital adoption techniques and invest in inclusive, context-sensitive interventions. These should encompass infrastructure development, human capacity building, and required institutional reforms. However, the study's limitations include its sole reliance on qualitative research methodology and literature review design.

### CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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