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# Defying decay: a strategy to enforce infrastructure standards in rural schools within the Eastern Cape, South Africa

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The Eastern Cape Department of Education (ECDoE) in South Africa faces significant infrastructure challenges in rural schools, including inadequate funding, poor maintenance, and a shortage of essential facilities. These challenges hinder quality education provision and violate the Minimum Uniform Norms and Standards for Public School Infrastructure (MUNS-PSI) regulations. This study investigates these infrastructure challenges and proposes strategies to improve adherence to MUNS-PSI regulations. An interpretivist philosophy and inductive approach were adopted, focusing on a case study strategy. The study employed a mono-method qualitative approach, collecting data through semi-structured interviews with ten school managers and senior managers within the Chris Hani East District infrastructure delivery section. Purposive sampling was used to select participants, and thematic analysis was applied to the data. The findings revealed that the ECDoE lacks credible plans, sound systems, and effective leadership, resulting in poor governance and non-service delivery. Key challenges identified include the absence of a retention plan and a shortage of technological expertise. The study suggests forming a cross-functional group led by the head of the Department of Education to manage school infrastructure effectively. Training officials on technical skills related to the built environment and implementing the Infrastructure Delivery Management System are recommended. These strategies aim to enhance adherence to MUNS-PSI regulations, thereby improving the educational infrastructure and quality of education in the Eastern Cape.

## KEYWORDS

rural school infrastructure, educational standards, infrastructure challenges, maintenance strategies, policy compliance, Eastern Cape education

## 1 Introduction

Education is a fundamental right for all children, and access to quality education is crucial for their development (Shepherd et al., 2021). However, providing quality education in rural areas poses unique challenges. In the Eastern Cape Province of South Africa, rural schools face significant infrastructure challenges that impede the delivery of quality education to thousands of children (Mpfu, 2019).

The Eastern Cape Department of Education (ECDoE) has struggled with low adherence to the Minimum Uniform Norms and Standards for Public School Infrastructure (MUNS-PSI) regulations, which aim to ensure that all schools meet specific minimum requirements to provide quality education. Despite these regulations, many rural schools in the Eastern

Cape lack basic services such as electricity, water, and sanitation, suffer from poor building conditions, lack access to technology and Internet connectivity, and face insufficient funding for infrastructure development (Hamann and Tuinder, 2012). These deficiencies have led to the closure of schools in some areas, causing community disruption and forcing learners to travel long distances to merged schools without adequate scholar transport (Equal Education, 2017).

Conversely, the ECDoE lacks a comprehensive strategy to implement MUNSPSI regulations in rural schools effectively. This deficiency results in significant infrastructure challenges and poor educational outcomes (Holloway, 2016). Addressing these infrastructure challenges is crucial for improving rural schools' academic performance and educational outcomes (Kaffenberger, 2021). Previous studies have underscored the importance of adequate school infrastructure for educational success but have often lacked detailed strategies for addressing specific compliance issues in rural settings (Barrett et al., 2015). This study aims to fill this gap by assessing the challenges faced by the ECDoE in meeting MUNSPSI regulations and devising strategies to maintain infrastructure in public rural schools.

This research aims to devise strategies to maintain infrastructure in public rural schools. The aim is realised through the following objectives.

- To identify areas where the ECDoE struggles to comply with MUNSPSI regulations.
- To develop strategies to improve adherence to these regulations in rural schools.

Ensuring that all schools meet the Minimum Uniform Norms and Standards for Public School Infrastructure is essential for the social and economic development of South Africa. An educated population is critical for attaining these development goals (Barrett et al., 2015).

The following sections will review the literature on school infrastructure development, discuss the challenges of meeting infrastructure standards, and explore potential strategies to address these challenges. The study's methodology will be explained, and the findings will be presented and analysed. Finally, the study's conclusions and recommendations will be outlined, along with its limitations.

## 2 Literature review

This section reviews the importance of infrastructure development in schools, the challenges experienced by developing countries and South Africa, and strategies to improve compliance with infrastructure standards for rural schools.

### 2.1 Infrastructure development in schools

Educational institutions must invest resources in improving infrastructure to enhance the effectiveness of educational delivery and institutional advancement (Barrett and Barrett, 2016). The development of school infrastructure significantly impacts the achievement of educational goals, enabling staff to perform their

duties more efficiently and increasing student enrolment (Dass and Rinquest, 2017). The availability of adequate infrastructural facilities is crucial in ensuring a conducive learning environment for students (Casale and Shepherd, 2021).

Research underscores the critical role of appropriate school infrastructure in contributing to the quality of the learning environment, which in turn affects student performance and success (Amsterdam, 2019). The National Treasury (2016) emphasises the importance of providing suitable amenities and facilities within the school environment to meet students' needs.

Inadequate school infrastructure and unequal distribution negatively affect learners' performance and achievement, educators' ability to deliver, and absenteeism among educators (Maldonado and DeWitte, 2020). Conversely, adequate facilities can play a decisive role in improving equity, increasing enrolment rates, and reducing dropout rates (Barrett et al., 2015; Maldonado and DeWitte, 2020). High-quality infrastructure has been shown to improve instructional quality and student outcomes significantly (Maldonado and DeWitte, 2020).

Despite the emphasis on the quality of education and school learning environments, many countries adopt a fragmented approach to investing in education infrastructure. Schools in marginalised areas typically have the greatest investment needs, with students attending these schools being doubly disadvantaged due to their low-income and rural backgrounds (Bhunia et al., 2019).

### 2.2 Challenges experienced by developing countries in infrastructure development

Educational institutions in developing countries face diverse challenges related to infrastructure development, rooted in economic, political, socio-cultural, geographical, and environmental factors. Economic constraints, characterised by limited financial resources, hinder substantial investments in school infrastructure, leading to inadequacies such as insufficient facilities and overcrowded classrooms (World Bank, 2018). These budgetary constraints are further exacerbated by corruption, which drains essential resources and obstructs infrastructural projects (Transparency International, 2013).

Regulatory frameworks overseeing infrastructure developments often fall short, necessitating robust policies to guide systematic and coordinated infrastructural endeavors (UNICEF, 2015). Maintenance issues are pervasive, with sustained efforts needed to ensure the longevity and functionality of educational infrastructures (Global Partnership for Education, 2019). Inadequate planning and lack of foresighted strategies also pose significant challenges, highlighting the need for well-crafted strategies and robust monitoring mechanisms (UNDP, 2016).

Community engagement presents both opportunities and barriers in infrastructure development. While community involvement can nurture developmental projects, it often faces conflicts and divergent interests (UNICEF, 2017). Geographical challenges, such as remote and inaccessible locations, significantly curtail access to basic infrastructure amenities, further widening the urban-rural divide (UNESCO, 2017). Environmental concerns and

the need for infrastructures resilient to environmental adversities are increasingly urgent in the contemporary era. The COVID-19 pandemic has underscored the need for infrastructural adaptability to meet emergent health and safety standards (WHO, 2020).

Technological advancements present a significant gap in the educational landscape of developing countries. Infrastructural reforms are needed to foster digital inclusivity and enrich the learning environment (UNESCO, 2019). Additionally, the scarcity of skilled personnel impedes infrastructure development, emphasising the need for initiatives fostering skill development (International Labour Organization, 2015).

A multidimensional discourse is imperative to navigate these challenges, focusing on feasible solutions that transcend existing barriers and foster educational spaces, epitomising inclusivity, resilience, and adaptability.

### 2.2.1 Challenges experienced by South African schools in infrastructure development

South Africa has made efforts to expand and enhance school infrastructure, aiming for inclusive and quality education. However, the path to infrastructure development is fraught with multifaceted impediments spanning financial, political, and socio-economic spheres. Funding and resource allocation constraints, exacerbated by misappropriation, often result in stalled or sub optimally executed projects (Spaull, 2013). Political dynamics, marked by corruption and policy fluctuations, create a volatile environment that hinders steady progress in school infrastructure development (Von Holdt, 2013).

The deterioration of existing infrastructure is a critical challenge, with many facilities requiring immediate refurbishment. Vandalism and theft exacerbate these issues, making maintenance an uphill task (Mestry and Ndhlovu, 2014). Socio-economic dimensions, such as poverty and inequality, significantly stifle the pace and quality of infrastructural development (Christie, 1999). Geographical disparities, particularly the pronounced urban-rural divide, create logistical impediments that hinder infrastructural development in remote locales (Fleisch et al., 2012).

In the digital era, schools grapple with obsolete technology and a lack of technological literacy, impeding the modernisation of infrastructure (Czerniewicz, 2018). The scarcity of skilled contractors leads to substandard constructions that are unsafe and susceptible to rapid deterioration, perpetuating a cycle of repairs and maintenance (Bowen et al., 2010).

Community engagement, while potentially a catalyst for successful project realisation, often faces internal conflicts and consensus deficits, obstructing development pathways (Soudien, 2007). The global directive towards sustainable development emphasises resilient infrastructures that align with the Sustainable Development Goals outlined by the United Nations [Department of Environmental Affairs, 2011]. The COVID-19 pandemic has further necessitated the reconfiguration of infrastructural norms and standards to adhere to heightened health and safety mandates (UNESCO, 2020).

In summary, the infrastructure development landscape in South African schools is marked by considerable hurdles. An integrative approach is required to leverage collective efforts and overcome existing challenges, fostering an environment conducive to learning and growth.

## 2.3 Strategies to improve compliance to infrastructure standards for rural schools

Improving compliance with the Minimum Uniform Norms and Standards for Public School Infrastructure regulations in the Eastern Cape Province of South Africa requires concerted efforts from all stakeholders, particularly the Eastern Cape Department of Education (Molefe, 2017). Regular school infrastructure audits are essential to identify non-compliance areas and prioritise interventions based on the severity of infrastructure gaps (Lockley, 2015). These audits will clearly understand the most pressing needs and help allocate resources more effectively.

Providing technical assistance and training to schools is another crucial strategy. Schools need support to understand and comply with the regulations, which includes training on maintenance procedures, infrastructure planning, and procurement processes (Molefe, 2017). Engaging experts in the field can provide valuable technical assistance to schools struggling to meet the standards.

Strengthening school infrastructure planning is vital to ensure that all schools have the necessary infrastructure to comply with the regulations. This involves developing comprehensive infrastructure plans that prioritise schools' needs and ensuring that the infrastructure budget is sufficient to address these needs (Lockley, 2015). Effective planning will help streamline efforts and focus on the most critical areas.

Improving monitoring and enforcement mechanisms is also essential to ensure regulation compliance. Enhanced school inspections and technology monitoring infrastructure maintenance can help identify and address issues promptly (Molefe, 2017). Non-compliant schools should face penalties and corrective measures to meet the required standards.

Increasing community engagement can significantly improve compliance with infrastructure regulations. Involving parents, community members, and school governing bodies in infrastructure planning and maintenance can reduce the burden on schools' limited resources and foster a sense of shared responsibility (Lockley, 2015). Community involvement can also lead to more sustainable and effective solutions.

Raising awareness and sensitisation among all stakeholders about the infrastructure regulations is crucial. Educators, school governing bodies, parents, community members, and government officials must understand the importance of compliance and its benefits. Awareness campaigns and workshops can help ensure everyone is informed and motivated to adhere to the regulations (Amsterdam, 2010).

Increasing funding for school infrastructure is essential to address the existing deficiencies. While government funding is crucial, partnering with private organisations and other stakeholders can provide additional resources. Establishing public-private partnerships with clear guidelines and effective monitoring can help mobilise the necessary funds for infrastructure development (Molefe, 2017).

Promoting a maintenance culture within schools is necessary to ensure that infrastructure is well-maintained and regularly serviced. Schools should develop maintenance plans outlining the regular maintenance activities needed and encourage a maintenance culture through sensitisation campaigns and training for educators and school governing bodies (Equal Education, 2017; Amsterdam, 2010).

By implementing these strategies, the ECDoE can significantly improve compliance with infrastructure standards, thereby enhancing the educational environment and outcomes for students in rural schools.

### 3 Methodology

This section elaborates on the “how” of the study, discussing the methodological paradigm, approach, and style adopted, as well as the methods of data collection and instruments used, methods of analysis, and the ethical considerations of the study.

The study adopted an interpretivist paradigm suitable for understanding human experiences and social phenomena. Interpretivism positions researchers as “feeling” actors who interpret their social roles based on attributed meanings, which is crucial for understanding the decision-making processes within the Department of Education (Holloway, 2016). This subjectivist stance allowed for a deeper understanding of the participants’ strategies.

An inductive approach was employed, facilitating the generation of theories and strategies based on the empirical data gathered from participant interviews. This approach was appropriate for developing a deeper understanding of the participants’ experiences and the context within which they operate.

A case study strategy was utilised, focusing on the Eastern Cape Department of Education and its rural schools. This design was chosen because it allowed for an in-depth examination of the specific context and the unique challenges these schools face in adhering to Minimum Uniform Norms and Standards for Public School Infrastructure (MUNS-PSI) regulations. The case study provided a detailed understanding of the phenomena within its real-life context, which is essential for developing practical and context-specific recommendations. The unit of analysis in this study was the individual managers and senior managers within the infrastructure delivery section of the Chris Hani East District schools.

The study adopted a mono-method qualitative approach, using semi-structured interviews as the primary data collection method. Semi-structured interviews allowed for flexibility in exploring different aspects of the challenges faced and the potential strategies for improvement. The interview guide included open-ended questions focusing on the strategies implemented to address maintenance issues, prioritisation of maintenance tasks, and challenges encountered in maintaining school infrastructure. There were a total of 15 questions designed to elicit detailed responses. The interviews were conducted via Zoom with ten managers from the Chris Hani East District schools and senior managers within their infrastructure delivery section.

Purposive sampling enhanced the study’s validity by selecting participants with relevant experience and knowledge of maintenance issues (Bryman, 2016). The selection of participants was justified by their roles and expertise in maintaining and developing school infrastructure, ensuring that the selected participants had a comprehensive understanding of the issues being investigated. The participants included.

- Director: Education Portfolio with 23 years of experience.
- Chief Quantity Surveyor: Education Portfolio with 12 years of experience.

- Three Project Managers: Education Portfolio with 7–15 years of experience.
- School Principal: Department of Education with 28 years of experience.
- School Inspector: Department of Education with 29 years of experience.
- Control Works Inspector: Education Portfolio with 8 years of experience.
- Two Building Inspectors: Education Portfolio with 5–8 years of experience.

The data analysis employed thematic analysis using NVivo software. Initially, the interview recordings were transcribed to prepare the data. The researchers then immersed themselves in the data by reading the transcripts multiple times to become familiar with the content. Significant statements were identified and assigned codes, subsequently grouped into themes. These themes were refined to ensure they accurately represented the data. The themes were then analysed to construct a narrative that captured the essence of the participants’ experiences.

Throughout the research, ethical considerations were paramount. The study adhered to Nelson Mandela University’s ethics policies, ensuring that informed consent was obtained from all participants and that their personal information was kept confidential to protect their rights and wellbeing.

To ensure the accuracy of the findings, the data were re-coded, and participants were invited to review the data outputs to confirm that their perspectives were accurately represented. Data validity was further confirmed by comparing the findings with existing literature (Onwuegbuzie and Johnson, 2017). This triangulation process enhanced the reliability and trustworthiness of the study’s findings.

The study’s limitations include its focus on a specific geographic area (Chris Hani East District) and the relatively small sample size of ten participants. While these factors limit the generalizability of the findings, the in-depth qualitative insights provided are valuable for understanding the specific context and developing targeted recommendations.

By adopting this structured approach, the study ensured a comprehensive and systematic examination of the research problem, generating meaningful insights and practical recommendations for improving adherence to maintenance regulations in the Eastern Cape’s public schools. The methodological design, including the use of an interpretivist paradigm, inductive approach, and case study strategy, is well-suited to the research aims and provides a robust framework for addressing the research questions.

## 4 Results

This section presents and discusses the respondents’ demographic profile and the study’s results.

### 4.1 Demographics of respondents

The demographic analysis of research participants in this study covered age, gender, years of work experience, and qualifications. A

TABLE 1 Demographics of respondents.

Participant	Age	Gender	Qualification
P1	41	M	Bachelor's degree in Public Management
P2	54	M	Honours degree in Information Technology
P3	39	M	Honours degree in Education
P4	36	M	Honours degree in Education
P5	48	M	Bachelor's degree in Public Management
P6	44	F	Master's degree in Public Management
P7	38	F	Master's degree in Project Management
P8	40	F	Honours degree in Financial Management
P9	52	M	Postgraduate Diploma in Business Management
P10	43	F	Master's degree in Education

total of 10 participants were involved in the study. The participants ranged from 36 to 52 years old, indicating that the sample comprised mature individuals with substantial professional experience. Specifically, the minimum number of years of work experience among participants was 5 years, while the maximum was 29 years.

The gender distribution of the sample showed a higher representation of males, who accounted for 60% of the participants. This gender distribution suggests that the insights provided in this study were predominantly from male participants, although female participants contributed a significant portion (40%).

Regarding educational qualifications, the participants possessed a range of academic degrees, including Bachelor's, Honours, Master's degrees, and a Postgraduate Diploma. This diversity in educational backgrounds indicates that the participants were well-educated and specialised in various fields, enhancing the credibility of the information provided.

The detailed demographic characteristics of the respondents are presented in [Table 1](#) below.

## 4.2 Challenges and strategies to MUNS-PSI regulations enforcement

The process of thematic analysis involved familiarising with the data, identifying unique words and anomalies, developing categories, and finally deducing themes from the categories (Gordon, 2016). The coding Figure ([Figure 1](#)) is hierarchical, with main themes on the left and sub-themes branching off to the right. Each theme and sub-theme was assigned a code, allowing the researcher to identify and categorise the data easily. This section elaborates on the responses from participants and the themes that emerged from the data. The findings are examined based on the responses given by each participant, considering their understanding of and familiarity with the topic.

The thematic analysis resulted in two main themes: "Compliance Challenges in Fulfilling the MUNS-PSI Regulations" and "Remedial Tactics for Improving Adherence to MUNS-PSI Regulations." These themes were further divided into categories and codes, as illustrated below.

## 4.3 Compliance challenges in fulfilling the MUNS-PSI regulations

This theme comprises two subcategories: i) Technical and Policy Challenges and ii) Institutional Administrative Challenges.

### 4.3.1 Technical and policy challenges

The study identified that technical and policy constraints hamper compliance with public school infrastructure's minimum norms and standards. Several participants highlighted these challenges:

P6 noted, "With my experience as a Department official, one of the challenges that we have been facing in promoting infrastructure of public schools in Chris Hani District is unreliable data from the Auditor General report."

P10 emphasised, "The issue of promoting MUNS-PSI requires the broad involvement of multiple stakeholders, including community members."

P9 added, "The decline in the rural population continues to hamper the optimal operation of schools in the area. Operational issues of the schools are, in my opinion, the biggest disadvantage."

From a technical perspective, participants indicated that the unavailability of required data is a significant drawback regarding compliance with MUNS-PSI. This aligns with UNICEF's (2015) view that regulatory frameworks overseeing infrastructure are ineffective. Von Holdt (2013) also noted governance deficiencies that contribute to these challenges. Timely availability of relevant data would enable decision-makers to make timely amendments. The need for involving multiple stakeholders emerged as a fundamental step in improving the state of school facilities, consistent with Soudien (2007) and UNICEF (2017), who stated that community involvement helps with resource mobilisation and safeguarding shared development interests. Additionally, the government has not done enough regarding policies aimed at reducing rural-urban migration, which has notably contributed to the decline in enrollment figures in rural schools.

### 4.3.2 Institutional administrative challenges

Participants also highlighted institutional administrative challenges at both the Department of Education and individual public school levels:

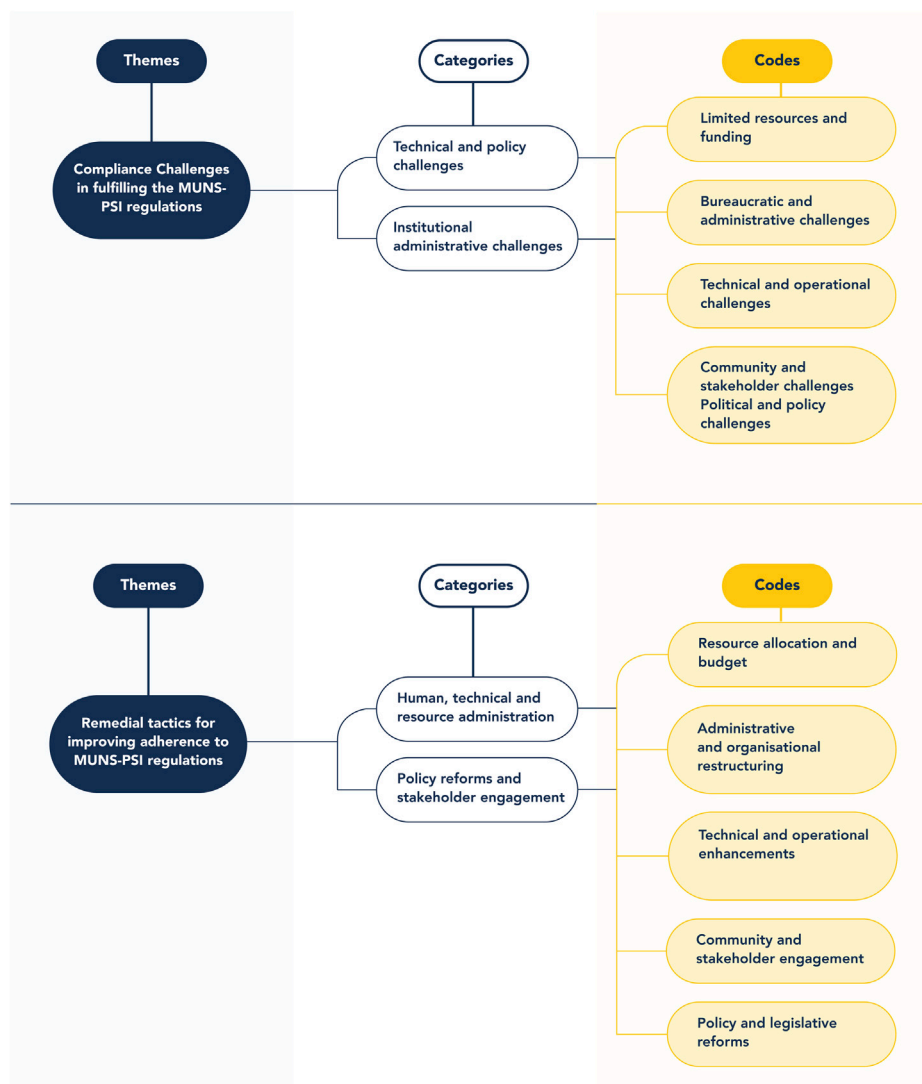


FIGURE 1 Themes development for MUNS-PSI regulations enforcement.

P4 stated, Corruption and fraud by some officials in the various offices is a huge drawback currently present. The money allocated to infrastructure improvement is sometimes diverted for personal use procurement.”

P5 commented, “I can tell you this Department is lacking funding for disaster and maintenance. I still remember when I went with my other colleagues on a school visit, I gathered that many schools are in emergency situations.”

P10 noted, “As the case with most public offices in this country, the Department of Education is being affected by bureaucracy. Decisions taken in the Department take too long to be finalised while the situation worsens. Political interference is playing a huge role in worsening the problem.”

Government institutions in South Africa have been associated with a lack of transparency. Participant P1 indicated that corruption adversely affects efforts toward maintaining well-serviced infrastructure in ECDoE schools. Spaul (2013) alludes to the misappropriation of financial resources directed toward infrastructure. Transparency International

(2013) emphasises that the development of infrastructure is significantly hampered by corruption. P5 also relayed that the Department of Education does not have funds to cover infrastructure damage resulting from disasters, which depletes the quality of education. As a remedy, the DEA (2011) supports constructing infrastructure resilient to environmental concerns. However, the lack of proactive policy promulgation is apparent. Furthermore, bureaucracy was noted as one of the constraints affecting compliance with regulations and institutional levels, as highlighted by UNDP (2016). It is a result of inflexible policies and systems prevalent in public schools.

#### 4.4 Remedial tactics for improving adherence to MUNS-PSI regulations

This theme comprises two subcategories: i) Human, Technical, and Resource Administration, and ii) Policy Reforms and Stakeholder Engagement.

#### 4.4.1 Human, technical and resource administration

Formulating remedial strategies for enhancing infrastructural maintenance in public schools was crucial. Participants provided several recommendations:

P9 suggested, “I recommend that the Minimum Uniform Norms and Standards for Public School Infrastructure mandate that provincial education departments should create plans that detail the state of infrastructure backlogs in their province and that these plans should abide by the various deadlines established by the Department of Basic Education.”

P7 added, “From what I have seen, I recommend that the Minimum Uniform Norms and Standards for Public Schools must be a responsibility of the school governing body. In my opinion, the SGB are custodians of these properties and better positioned to administrate maintenance.”

P2 emphasised, “The availability of a reliable and accessible database is very important in this situation. As long as the DoE continues using paper systems, keeping well-updated data on the state of infrastructure in public schools will be difficult.”

According to Lockley (2015), the administration of school infrastructure is paramount. The participants agree with these views, indicating the importance of effective administration. The contributions of the research participants highlight the need for a properly working database. The suggestion of transferring the MUNS-PSI regulations’ responsibility to school governing bodies aligns with Molefe’s (2017) view that partnering with other stakeholders may achieve the anticipated goals. According to the ECDoE (2020), the condition backlogs have increased by R7.3 billion due to neglecting facilities and lack of routine maintenance through the N&S maintenance budget allocated to schools.

#### 4.4.2 Policy reforms and stakeholder engagement

Several challenges identified in the SCM of eThekweni municipality were human-related issues. Participants highlighted the following:

P3 stated, “I think to address the challenges, the ECDoE needs to cross-reference their project list attached to their Minimum Uniform Norms and Standards for Public School Infrastructure implementation plan and the national Department of Basic Education’s ASIDI list. I am sure this will help to check whether the government has plans to upgrade the schools.”

It is important to note that the relevant departments responsible for constructing, maintaining, and improving infrastructure in public schools seemingly work in isolation. There is a need for integrated systems that capture asset registers and track maintenance records and planned budgets. UNICEF (2015) alludes to this fragmentation as a challenge for adequate school infrastructure development in developing countries.

P6 remarked, “Communities are the immediate beneficiaries of the schools within their area; they are also the immediate losers when infrastructure dilapidates. I strongly believe that the school governing body and community members must play their role in ensuring public infrastructure remains intact.”

P5 pointed out, “As far as I am concerned, the Department of Education should implement the National Development Plan (NDP), which identifies the need to ensure that all schools meet minimum standards for infrastructure and commit to upgrading each school’s infrastructure to meet optimum standards.”

The response from Participant P6 indicates that the duty to restore sanity in public schools requires community members to participate actively in all the relevant processes. This aligns with submissions by Molefe (2017); however, care must be taken to ensure effective stakeholder management. Furthermore, it was highlighted that the local School Governing Body (SGB) also has a central role to play in the upkeep of the school’s infrastructure. Additionally, Participant P5 pointed out that the National Development Plan (NDP) is an existing template that can be used to map out the policy parameters that guide infrastructure maintenance in public schools. Lockley (2015) supports adequate infrastructure plans that prioritise schools’ needs. Equal Education (2017) proposes school infrastructure maintenance plans specifically developed within individual schools, which may guarantee swifter actions and reactions to maintenance issues.

## 5 Discussion

The findings of this study highlight several critical challenges and strategies related to enforcing the Minimum Uniform Norms and Standards for Public School Infrastructure (MUNS-PSI) regulations within the Eastern Cape Department of Education (ECDoE). This discussion critically examines the key themes of compliance challenges and remedial tactics identified through thematic analysis.

### 5.1 Demographic profile of respondents

The demographic profile of the respondents reveals a mature and experienced sample, with participants ranging from 36 to 52 years old and possessing substantial professional experience (5–29 years). The higher representation of male participants (60%) may introduce a gender bias in the insights provided, potentially limiting the perspective on certain issues. However, the significant portion of female participants (40%) ensures a degree of balance. The diversity in educational qualifications, ranging from Bachelor’s to Master’s degrees and a Postgraduate Diploma, enhances the credibility and depth of the data, as participants bring varied academic backgrounds and professional specialisations to the discussion.

### 5.2 Compliance challenges in fulfilling MUNS-PSI regulations

The study identified two primary subcategories of compliance challenges: Technical and Policy and Institutional Administrative.

#### 5.2.1 Technical and policy challenges

Participants highlighted unreliable data from the Auditor General’s reports and the lack of broad stakeholder involvement as significant obstacles. The unavailability of accurate data hampers effective decision-making and timely amendments, aligning with the views of UNICEF (2015) and Von Holdt (2013) on the inefficacy of current regulatory frameworks and governance deficiencies. The necessity for involving multiple stakeholders, including community members, aligns with the findings of Soudien (2007) and UNICEF (2017), emphasising that community involvement is crucial for resource mobilisation and

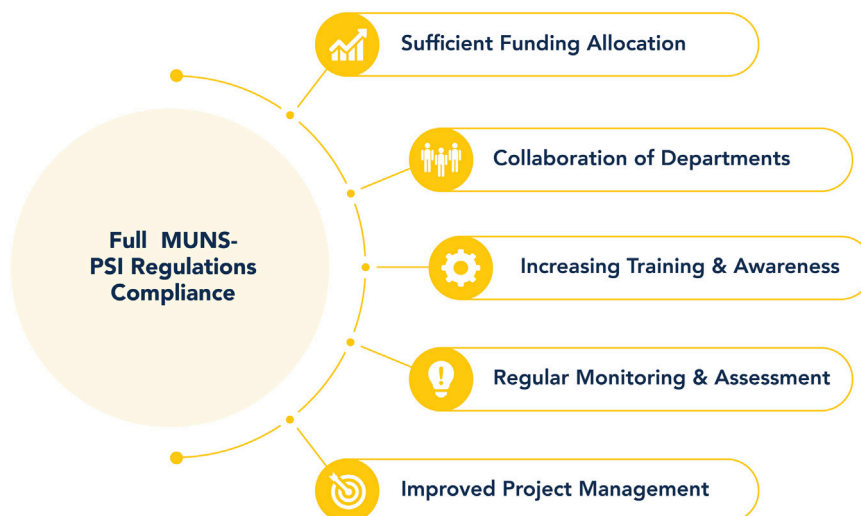


FIGURE 2  
Strategic framework for achieving full compliance with MUNS-PSI regulations.

safeguarding shared development interests. However, the government's failure to implement policies to reduce rural-urban migration has exacerbated rural enrollment decline, compounding these schools' operational challenges. This issue underscores a critical gap in policy implementation that needs urgent attention to stabilise and enhance rural school operations.

### 5.2.2 Institutional administrative challenges

Institutional administrative challenges are further exacerbated by corruption and fraud within the Department of Education, as highlighted by several participants. As Spaul (2013) and Transparency International (2013) noted, the misappropriation of funds intended for infrastructure improvement significantly undermines the quality of education. Bureaucracy and political interference delay crucial decisions and actions, leading to deteriorating school conditions. This finding is consistent with UNDP (2016), which highlights the impact of inflexible policies and systems on regulatory compliance. The lack of funding for disaster and maintenance further depletes the educational infrastructure, necessitating a more proactive policy approach and resilient infrastructure construction, as the DEA (2011) supports.

## 5.3 Remedial tactics for improving adherence to MUNS-PSI regulations

The study proposed several remedial tactics categorised into Human, Technical, and Resource Administration, and Policy Reforms and Stakeholder Engagement.

### 5.3.1 Human, technical, and resource administration

Participants emphasised the importance of a reliable and accessible database to maintain up-to-date information on school infrastructure. This aligns with Lockley (2015), who stresses the

need for effective infrastructure administration. The suggestion to transfer MUNS-PSI compliance responsibility to school governing bodies (SGBs) resonates with Molefe (2017), who advocates for stakeholder partnerships to achieve infrastructure goals.

The ECDoE's backlog in infrastructure maintenance, which has increased significantly, underscores the urgency of implementing these administrative improvements to ensure timely and effective infrastructure upkeep.

### 5.3.2 Policy reforms and stakeholder engagement

The need for integrated systems that capture asset registers and track maintenance records was highlighted, pointing to the fragmentation issues noted by UNICEF (2015). Cross-referencing project lists with national plans, as suggested by participants, would ensure cohesive planning and resource allocation.

Community involvement emerged as a critical factor, with participants advocating for active participation by community members and SGBs in maintaining school infrastructure. This aligns with Molefe (2017) and highlights the potential for community engagement to drive sustainable solutions.

The National Development Plan (NDP) was identified as a key framework for guiding infrastructure maintenance, emphasising the importance of aligning provincial and national policies to streamline efforts. As suggested by Equal Education (2017), the proposed infrastructure maintenance plans within individual schools would ensure swifter responses to maintenance issues, promoting a proactive maintenance culture.

The study's findings comprehensively understand the challenges and potential strategies for improving adherence to MUNS-PSI regulations in rural schools. The thematic analysis approach offers nuanced insights into the complex interplay of technical, policy, and administrative factors affecting school infrastructure. Implementing the proposed remedial tactics, focusing on reliable data, stakeholder involvement, and cohesive policy frameworks, is essential for enhancing the educational infrastructure and outcomes in the Eastern Cape's rural schools.



Future research should explore the role of community participation and public-private partnerships in addressing these challenges, incorporating quantitative methods to validate and expand upon these qualitative insights.

## 6 Conclusion

Rural schools in the Eastern Cape Department of Education (ECDoE) in South Africa face substantial infrastructure challenges. This study aimed to investigate these challenges and develop strategies to improve adherence to the Minimum Uniform Norms and Standards for Public School Infrastructure (MUNS-PSI) regulations. The findings indicate that numerous obstacles hinder MUNS-PSI implementation, including technical and policy challenges and institutional administrative challenges. A critical issue identified is the lack of funding for disaster and maintenance, alongside insufficient resource allocation for infrastructure development. These deficiencies impair the Department of Education's ability to meet targets and enhance public school infrastructure, resulting in hazardous conditions for learners.

The study identified several key findings. Technical and policy challenges were significant barriers. For instance, unreliable data from various reports, including the Auditor General's report, complicates infrastructure planning and implementation. The involvement of multiple stakeholders is necessary for effective infrastructure development, and declining rural populations negatively impact the operational efficiency of schools. Institutional administrative challenges were also prominent. Corruption and fraud within departmental offices divert funds meant for infrastructure improvement, and bureaucratic delays hinder timely decision-making and implementation. Additionally, insufficient funding for disaster response and maintenance exacerbates infrastructure deterioration.

## 7 Recommendations

Based on these findings, several recommendations have been formulated to address these challenges effectively. Improved human, technical, and resource administration is essential. Establishing a reliable and accessible database to maintain up-to-date information on the state of school infrastructure would facilitate informed decision-making and timely interventions. Assigning the responsibility of MUNS-PSI compliance to school governing bodies (SGBs) could leverage their local knowledge and vested interest in maintaining school facilities.

Policy reforms and stakeholder engagement are also crucial. Provincial education departments should create detailed plans that address infrastructure backlogs and adhere to deadlines established by the Department of Basic Education. Cross-referencing the ECDoE's project list with the National Department of Basic Education's Accelerated Schools Infrastructure Delivery Initiative (ASIDI) list would ensure cohesive planning and resource allocation. Encouraging community involvement in maintaining and upgrading school infrastructure would foster a sense of ownership and responsibility.

Strategic coordination and public-private partnerships are recommended to enhance the overall effort. Enhancing coordination between the ECDoE and other government departments could avoid duplication of efforts, reduce bureaucracy, and promote a unified approach to addressing infrastructure challenges. Establishing public-private partnerships would bring additional funding and expertise to tackle infrastructure problems in rural schools.

Forming a cross-functional team within the ECDoE to provide strategic guidance and oversee school infrastructure delivery is also recommended. This team should have decision-making authority in planning, controls, and leadership areas.

Further research is recommended to explore the role of community participation in addressing infrastructure challenges in rural schools in the Eastern Cape. Additionally, examining the structure of potential public-private partnerships for delivering adequate school infrastructure could provide valuable insights. Although this study employed qualitative methods, future research could incorporate quantitative techniques to provide broader perspectives and validate the findings.

## 8 Strategic framework

Figure 2 below visually represents a strategic framework for fully complying with MUNS-PSI regulations.

The framework outlined in the figure identifies five fundamental elements critical for compliance with MUNS-PSI regulations.

1. **Sufficient Funding Allocation:** The availability of adequate funding is the primary factor for consideration. Ensuring sufficient financial resources are allocated for infrastructure maintenance and development is essential for meeting MUNS-PSI standards.
2. **Collaboration of Departments:** Effective collaboration between various departments and stakeholders is vital. This includes engaging school governing bodies (SGBs), community representatives, and other relevant stakeholders in the planning and execution of infrastructure projects. Such collaboration ensures that all parties know their roles and responsibilities, promoting a coordinated effort towards maintaining school infrastructure.
3. **Increasing Training and Awareness:** Training stakeholders, including SGBs and community representatives, is crucial for increasing awareness about maintaining infrastructure. Educating these stakeholders on best practices and the significance of their involvement in infrastructure upkeep helps foster a proactive maintenance approach.
4. **Regular Monitoring and Assessment:** Continuous monitoring and assessment of school infrastructure are necessary to identify issues promptly and address them before they escalate. Regular inspections and evaluations help maintain high standards and ensure that infrastructure remains in good condition.
5. **Improved Project Management:** Based on the findings from monitoring and assessments, there is a need to enhance project management practices. Implementing effective project management strategies ensures that infrastructure projects are completed on time, within budget, and to the required

standards. This includes adopting best practices in project planning, execution, and oversight.

To provide a structured approach for addressing the identified challenges, a framework is proposed for improving infrastructural standards in rural schools. This framework includes implementing a robust data management system to track infrastructure conditions and needs, fostering collaboration between governmental, non-governmental, and community stakeholders, ensuring adequate and timely allocation of resources for maintenance and disaster response, aligning provincial and national policies to streamline infrastructure development efforts, and actively involving local communities in infrastructure planning and maintenance.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

The studies involving humans were approved by Engineering, the Built Environment and Technology H-REC. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

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