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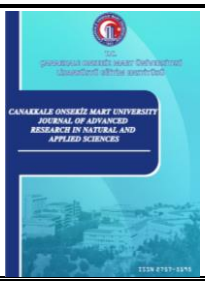

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Assessment of Construction Site Management Practices: A Case Study of a Construction Project in Hargeisa

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Abstract − The effective management of construction sites is crucial for minimizing risks such as lost productivity, injuries, and theft and ensuring the successful completion of projects. Site management encompasses applying scientific methods and evaluation criteria to plan and organize various production factors, including workforce, machinery, and materials. Managing these factors is vital for transforming raw materials into the final product. Inefficiencies in site management often lead to increased rework, defects, delays, disputes, and cost overruns, affecting construction projects. This study evaluated a construction project in Hargeisa, utilizing six established construction site management practices as assessment criteria. The findings reveal significant shortcomings in the site management practices, with 15 key items within these practices either partially performed or not performed. These inadequacies mirror the broader challenges construction sites face in Hargeisa, highlighting the need for a more robust and comprehensive site management approach. The study's findings indicate that implementing an improved site management procedure is critical for the long-term sustainability of the construction industry in Hargeisa. Such improvements are essential for enhancing project efficiency, reducing costs, and safeguarding the health and safety of workers and all individuals involved in the construction projects. Based on the evaluation, the study proposes specific recommendations to address these shortcomings, aiming to contribute to advancing construction site management practices in the region. These recommendations could significantly improve project outcomes, worker safety, and industry standards.

Keywords − *Construction, management practices, site management, Somaliland*

1. Introduction

The construction industry is critical to the economic development of countries. It contributes directly and indirectly to the economic productivity of especially developing and underdeveloped countries [1]. Due to its close links with other sectors of the economy, the industry contributes significantly to the development and expansion of human settlements. It also promotes employment and income through development and economic growth [2]. The construction sector in Somaliland plays a crucial role in the country's economic growth and sustainability, much like in other low-income countries. However, the sector in Somaliland faces unique challenges due to the absence of building codes or regulations, leading to safety standards primarily maintained by building owners and contractors [3]. Against this backdrop, our study specifically focuses on examining construction site management practices within the scope of a public construction project in Somaliland.

The primary aim of this study is to systematically assess and identify the prevailing construction site management practices in Somaliland, particularly focusing on a public construction project. We intend to

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evaluate these practices against established standards and identify areas for improvement. In doing so, we hope to enhance construction site management, fostering better safety standards, efficiency, and overall project success in Somaliland's construction sector.

While there have been numerous studies on construction site management practices, this research is distinctive in its focus on the specific context of Somaliland, a region with unique challenges due to the absence of formal building codes and regulations. This study comprehensively assesses current construction site management practices in Somaliland and offers a pioneering analysis by benchmarking these practices against international standards. Furthermore, our exploration of six basic site management practices is tailored to address the specific context and requirements of the Somaliland construction sector. This novel approach aims to yield contextually relevant insights and broadly applicable to similar regions facing comparable challenges. Through this study, we aim to contribute to the body of knowledge in construction site management, particularly in under-researched regions, and offer practical recommendations for enhancing safety, efficiency, and success in construction projects within such unique contexts. Following the framework outlined by Jimoh [4] and Mohamed [5], our study will explore six basic practices for site management, providing a comprehensive analysis of their application and effectiveness in Somaliland's construction sector.

- **Management, Supervision, and Administration of Construction Sites:** The management of construction sites is a critical process that hinges on effectively disseminating and exchanging information. This exchange encompasses a wide array of information, such as meeting minutes, requests for information, labor allocation documents, payrolls, progress reports, notices or requests, instructions, drawings, and technical information [6]. The efficiency and effectiveness of the construction process largely depend on the quality of this communication. Improved communication between various stakeholders, including construction and project teams, managers, and contractors, reduces the likelihood of project failure [7].

Each construction project involves stakeholders collaborating relatively quickly to develop the required facilities. However, the physical separation between construction sites and offices exacerbates the complexity of exchanging information between design teams and contractors. This distance often poses significant challenges in accessing and sharing project information promptly and efficiently. It is also crucial to consider the impact of leadership styles and team dynamics on project outcomes. The study by Ju et al. [8] highlights the effects of toxic leadership and project team member's silence on mega construction projects providing valuable insights into these dynamics. It reveals that toxic leadership negatively influences project success by fostering a culture of silence among team members. This finding is significant as it underscores the importance of positive leadership and open communication in construction site management.

Furthermore, the dynamic nature of construction projects, characterized by frequent changes and adjustments, necessitates a robust and flexible communication system. Therefore, Effective communication strategies must accommodate the project's evolving needs, enabling stakeholders to respond quickly to changes and make informed decisions. To address these challenges, it is essential to implement advanced communication technologies and practices that facilitate seamless information flow. These may include digital collaboration tools, project management software, and mobile communication platforms that enable real-time updates and access to project information, regardless of the participants' location. By enhancing communication channels and adopting a more integrated approach, construction projects can achieve greater coordination, reduce misunderstandings and errors, and ultimately improve project outcomes.

The management of construction sites extends beyond the mere exchange of documents and information; it encompasses the creation of a communication ecosystem that supports the collaborative and dynamic nature

of construction projects. Emphasizing effective communication strategies and leveraging technology can significantly contribute to the success of construction projects, ensuring timely completion, adherence to quality standards, and overall project efficiency.

• **Commercial Management of Construction Sites:** Construction sites serve as the operational grounds for mobilizing resources to produce built environments. Commercializing these sites involves a multifaceted process ensuring effective utilization and control of financial resources. This process is integral to the success of construction projects, as it encompasses a range of activities, including estimations, valuations, variations, day-to-day work, cost-value reconciliation, final accounts, and cash flow management [6].

At the core of commercial management is developing a cost control system. This system enables the site management team to collect and produce financial information accurately, tracking actual costs and comparing them with estimated costs. The relevance of such a system cannot be overstated, as it provides the basis for informed decision-making and financial oversight throughout the project lifecycle. Moreover, extracting relevant information from project models and specifications is pivotal in producing realistic cost estimates [9]. These estimates are critical in planning and guiding resource allocation and expenditure during project implementation. Vivek and Hanumantha Rao [10] highlight that cost overruns are a primary source of conflict in construction projects, underscoring the importance of accurate and realistic cost planning.

Effective commercial management extends beyond cost estimation; it encompasses cost integration with other key project dimensions such as time, quality, and scope. The cost performance of a project, being a crucial indicator of its success, can be effectively managed using the fifth dimension (5D) of Building Information Modeling (BIM) [11]. This tool is a potential solution for efficient cost management, enabling better control over financial resources. Cost management is not limited to estimation but involves the application of management accounting concepts and methods for data collection, analysis, and presentation [12]. This comprehensive approach is necessary to provide the information needed to plan, monitor, and control costs effectively.

These elements collectively form the foundation of comprehensive project management. Managing costs effectively across all project stages is a financial necessity and a strategic imperative influencing the overall project trajectory. Commercial management in construction sites is a critical function that requires meticulous attention to detail and strategic foresight. It demands a holistic approach that balances financial considerations with project objectives, ensuring that projects are completed within budget and meet the desired quality and scope. By implementing robust commercial management practices, construction projects can mitigate the risks of cost overruns, reduce conflicts, and enhance their overall success.

• **Legal, Health, and Safety Management:** Legal, Health, and Safety Management is a crucial aspect of construction site management, encompassing a range of responsibilities to ensure the safety and well-being of all employees and users involved in the project. According to Kömürlü and Toltar [13], this includes providing adequate training to personnel, monitoring compliance with safety standards, and enforcing penalties when necessary to maintain high safety levels. However, the construction sector's inherent complexity and diversity present significant challenges for safety managers. As Kulinan et al. [14] note, this complexity often makes conducting thorough and effective safety inspections difficult, essential for preventing accidents and ensuring a safe working environment.

Effective health and safety management at construction sites involves more than just adherence to safety protocols; it requires a comprehensive approach legally backed by security policies, insurance, standards, and building/enforcement rules [6]. Ensuring compliance with these legal requirements is crucial for avoiding legal

disputes and maintaining a safe and secure work environment. Moreover, the project plan often serves as a formal document outlining the project's performance standards. Therefore, any deviation from the standards presented in the project plan can lead to disagreements and legal issues.

In this context, it is essential to implement proactive measures to manage health and safety risks on construction sites effectively. This includes regular risk assessments, appropriate personal protective equipment (PPE), the implementation of safety training programs, and the development of emergency response plans. Fostering a safety culture among workers and management ensures that health and safety practices are consistently applied and respected.

In the context of Somaliland, as highlighted by Fashina et al. [3], the absence of official building codes and regulations presents a significant challenge for legal, health, and safety management in construction projects. Without standardized regulations, contractors and builders often rely on their judgment and experience, potentially leading to inconsistencies in safety standards and practices. This situation complicates efforts to ensure the safety and well-being of workers but also increases the risk of legal disputes and conflicts related to construction quality and safety.

Furthermore, Fashina et al. [3], one of a few studies conducted in this context, emphasize that in Somaliland, building owners and contractors are primarily responsible for maintaining safety standards, varying significantly from one project to another. This lack of uniformity and formal regulatory oversight can result in varied levels of compliance with basic health and safety measures. The study also points out that there is a need for the government to actively involve various stakeholders, including building occupants, owners, builders, and public health professionals, in developing and implementing building codes. Such involvement is crucial for reducing risks, enhancing public safety, and promoting health in the built environment.

Implementing proactive measures to effectively manage health and safety risks on construction sites is essential. This includes regular risk assessments, appropriate personal protective equipment (PPE), the implementation of safety training programs, and the development of emergency response plans. Promoting a safety culture among workers and management is key to consistently applying and respecting health and safety practices. Furthermore, given this local context in Somaliland, construction projects must adopt best practices in legal, health, and safety management, even without formal building codes. This includes conducting regular risk assessments, ensuring the use of proper safety equipment, providing adequate training to workers, and developing emergency response plans. Additionally, there is a need for advocacy and efforts to establish official building codes and regulations in Somaliland to standardize safety practices and provide a legal framework for resolving disputes and ensuring compliance with safety standards.

- **Planning, Monitoring, and Control:** Planning, Monitoring, and Control in construction site management encompass a comprehensive process that begins with the identification, evaluation, development, and organization of the necessary resources for executing a construction project. This practice extends beyond mere resource allocation; it involves strategically arranging these resources to facilitate smooth project progression and successful delivery [6].

In every construction project, detailed planning is crucial. Plans are meticulously crafted to ensure work is conducted according to desired quality standards, completed within the predetermined timeframe, and maintained within the budget. However, due to the inherent uncertainties and complex construction work, deviations from the original plan are common. In contrast, some divergence is expected and manageable, and significant gaps between planned and actual performance warrant immediate corrective action. This alignment is necessary to steer the project back on course with its original objectives [15].

Regularly monitoring and comparing the project's progress against the plan are vital. This ongoing evaluation allows for the early detection of discrepancies, enabling project managers to implement timely control measures. Effective monitoring includes tracking resource utilization, schedule adherence, cost management, and quality control. It ensures that any deviation from the plan is promptly identified and addressed.

The importance of a robust monitoring and control system cannot be overstated. Such a system is pivotal in minimizing project deviations and ensuring the project adheres to its planned trajectory. It gives decision-makers real-time insights into the project's status, facilitating informed decision-making. When variations from the planned status are observed, decision-makers can take swift and appropriate action to rectify the situation, thus preventing further escalation of issues [16].

Planning, Monitoring, and Control form the backbone of effective construction site management. This practice guides the project through its various phases and ensures each stage aligns with its goals. By diligently applying these practices, construction projects can achieve their quality, time, and cost objectives, ultimately leading to successful project delivery.

• **Delivery and Storage of Materials:** This construction site management application is crucial in managing resource management on construction sites, particularly concerning materials and facilities. It encompasses the management of deliveries and requisitions, purchase orders, material recalls, factory returns, and other related processes, handling these aspects from various perspectives [6]. Since the cost of materials in construction projects can range from 30 to 70 percent of the total project cost [17], effectively managing these materials is essential for controlling both efficiencies and costs in construction projects.

Recent studies underscore the need to transform materials management processes to improve efficiency and effectiveness in handling materials. Inadequate construction material handling significantly impacts a construction project's entire cost, time, quality, and productivity. Therefore, improving the delivery and storage of materials is about maintaining an inventory and enhancing the overall construction process. Effective management in this area is crucial to reduce material waste during the construction phases, which is essential to avoid loss of profits and ensure project sustainability [18].

Furthermore, effective delivery and storage of materials can address potential causes of project delays, such as late purchase, late delivery, weak transport systems, and stringent public procurement procedures. Properly managed materials deliveries and storage systems can ensure timely availability of materials, preventing project timeline disruptions.

Properly managing materials in construction sites can benefit construction project management. It assists in speeding up the completion period, saving execution time, delivering high-quality works, reducing materials wastage, and improving project cash flow management. Thus, the delivery and storage of materials play a pivotal role in the overall success and efficiency of construction projects.

• **On-site Production Management:** On-site Production Management is a critical component of construction site management, focusing on applying quality procedures to on-site and off-site production. This practice is essential for maintaining high-quality levels and reducing the occurrence of malfunctions during construction. Operations supporting production include quality assurance plans and reports, adherence to contract terms, and careful review of drawings, specifications, and measurements.

One of the most common reasons for delayed activities in construction projects is issues related to construction design. The intricate design process involves multiple disciplines with strong reciprocal interdependencies. Frequent iterations are required to mature the design, and even when the design is considered complete,

managers often encounter problems with outdated drawings, incorrect measurements, and the need for further clarification of specific details [19]. These challenges can significantly impact the smooth execution of the construction process.

Quality issues, in particular, can lead to substantial delays. In addition to the extra time spent on rework, these issues can be costly and disrupt the project's schedule. Quality assurance plans and reports, contract terms, drawings, specifications, and measurements are all examples of operations that support production. Quality assurance focuses on consumer protection and provides customers with the confidence that the building has been constructed adequately under acceptable quality control conditions and is fit for its intended use [6].

It is crucial for the site manager to closely monitor production and promptly address any issues of delay or poor quality. Early identification of problems allows managerial actions to improve quality, expedite production, or update production schedules to reflect the new situation and mitigate further delays.

Effective on-site production management, therefore, requires a proactive approach to identify and address design-related issues and challenges in connecting work. By staying vigilant and responsive to these common challenges, site managers can ensure that production activities are carried out efficiently and according to plan, ultimately contributing to the successful and timely completion of construction projects.

2. Methodology

This study assessed the alignment of a public project's management approach with six established construction site management practices, as outlined in the previous section. We selected a public construction project in Hargeisa, Somaliland, as a representative case for this evaluation. Our methodology involved conducting on-site observations to closely examine the application of these six construction management practices, as defined by Jimoh [4] and Mohamed [5].

We systematically observed and recorded various aspects of the construction project's management during our site visits. This included scrutinizing practices related to planning, resource allocation, safety measures, material management, communication, and quality control. The data gathered from these observations were then meticulously evaluated and organized in a tabulated format.

This approach allowed us to comprehensively analyze how much the construction project adhered to the six key site management practices. We aimed to identify strengths and areas for improvement in the project's management approach, providing insights into the effectiveness of current practices in the context of Hargeisa's construction industry. The findings from this analysis are presented in the following sections, offering a detailed evaluation of the project's management practices and their compatibility with the established standards.

2.1. The Construction Site

The construction industry is pivotal in developing infrastructure and educational facilities, particularly in regions striving for economic and social progress. In this context, the construction site of the Somaliland National College of Education in Hargeisa stands as a prime example of how public projects can significantly contribute to educational advancement and community development. Located approximately 10 km from the city center, this project, initiated in January 2021, is a testament to the ongoing efforts to enhance the educational landscape in Somaliland.

The site encompasses two major parcels, Lot 5 and Lot 6, each with distinct structures designed to cater to the diverse needs of the college. Lot 5 features the construction of a girls' dormitory building. This two-story (Z+1) structure spans an area of 564 square meters and is meticulously designed to provide a safe and comfortable living space for female students. The dormitory is envisioned as a nurturing environment supporting its residents' academic and personal growth.

In Lot 6, the project is more expensive, comprising several key facilities. The centerpiece is a laboratory and library building, covering a single-story area of 898 square meters. This building is poised to become a hub of learning and research, equipped with modern laboratory facilities and a comprehensive collection of academic resources. Adjacent to it is the kitchen and dining hall building, encompassing a space of 402 square meters. This building is designed to be a communal area where students and faculty can gather for meals, fostering a sense of community and collaboration. An essential component of Lot 6 is constructing an underground water tank with a capacity of 425 cubic meters. This facility ensures a reliable water supply for the new buildings and the college campus.

Figure 1. Location of the project on Google Maps showing previously existing buildings

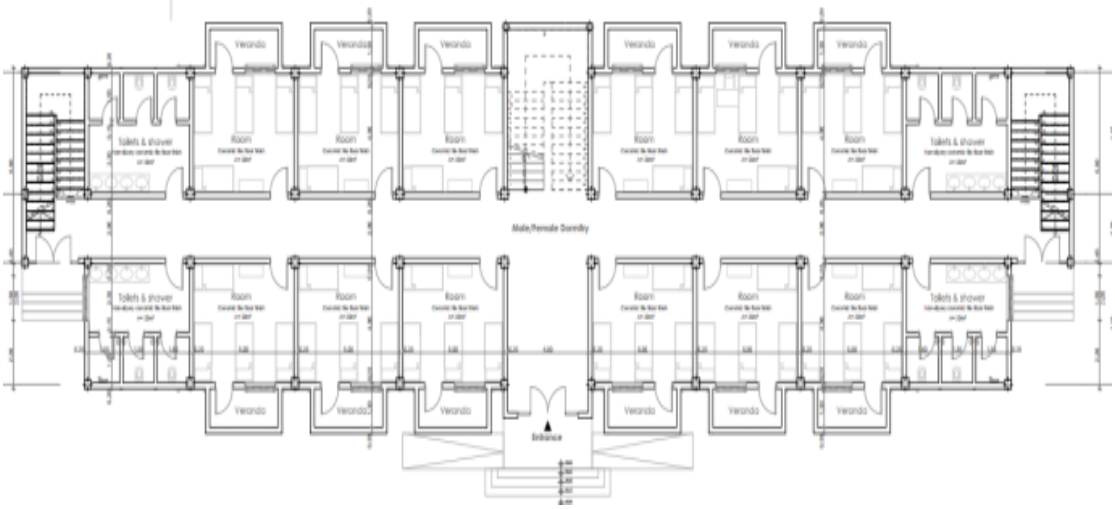

Figure 2. Lot 5 Floor Plan (Girls' Dormitory)

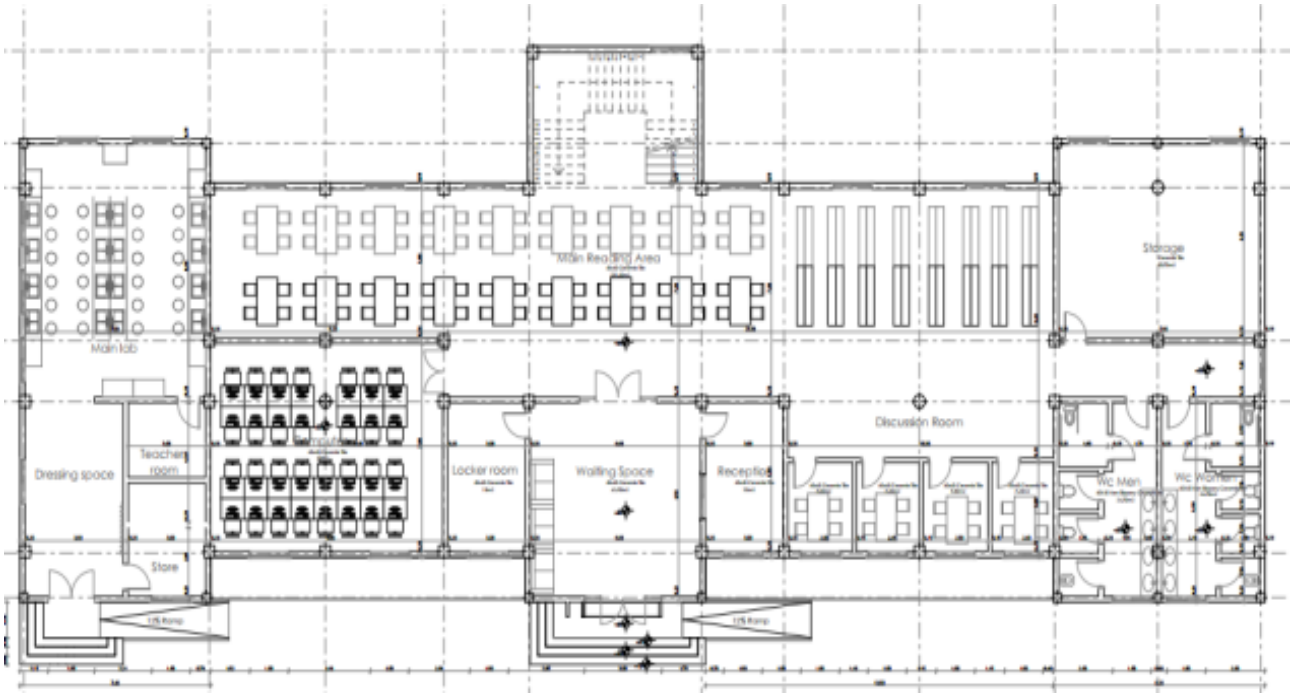

Figure 3. Lot 6 Floor Plan (Laboratory and Library)

Overall, the construction site of the Somaliland National College of Education represents a significant endeavor in the realm of educational infrastructure. The development of these new facilities is set to provide enhanced learning environments, accommodation, and essential services, thereby enriching the educational experience for students and staff at the college. This project serves as a beacon of progress and is a key contributor to the educational and socio-economic development of the region.

2.2. Current Situation of the Construction Site

This section provides a snapshot of the current state of the construction site, highlighting both the physical infrastructure in place and the progress made on specific building structures. The construction site houses two material warehouses and a single guard room, the primary facilities. However, notable absences include a dedicated management office, a technical office for project planning and execution, restrooms for workers, and a cafeteria. These missing facilities are essential for efficient site operation and worker welfare. Additionally, there is a lack of an appointed Occupational Health and Safety (OHS) expert for the project, which is a significant concern considering the importance of safety in construction sites.

As for the progress of the construction project as of April 2022, the development of various structures varies. The laboratory and library building in Lot 6 is approximately 59% complete, showcasing considerable advancement. The kitchen and dining hall in the same lot are less advanced, with around 28% completion. In contrast, the underground water tank in Lot 6 has seen significant progress, with 85% of the construction completed. On a different note, the girls' dormitory in Lot 5 is relatively less developed, with only 26% of the construction completed.

Figure 4. The current stage of the construction

The lack of critical facilities and an OHS expert points to areas that require immediate attention to ensure the smooth functioning and safety of the site. The varied completion rates across different structures indicate the ongoing nature of the project and the need for continued management and coordination to achieve completion.

In addition to the physical attributes of the construction site, it is crucial to acknowledge the broader regulatory environment in which these projects operate. The study by Fashina et al. [3] reveals that Somaliland currently lacks official building codes or standards. This absence has led to contractors relying primarily on their judgment and experience, often referencing the standards of other countries. Such a situation inevitably results in numerous legal disputes and a general lack of clarity in construction practices. The lack of standardized codes and regulations poses challenges to ensuring consistent quality and safety standards and complicates the management and administration of construction sites. This regulatory vacuum is a significant concern in the current construction landscape of Somaliland. It highlights the need to develop and implement official building codes to guide construction practices more effectively.

3. Results

This study comprehensively observed a public construction project in Hargeisa, Somaliland, to evaluate construction site management practices. The project was selected to represent typical construction practices in the region. Through a detailed and systematic approach, we aimed to identify key areas of strength and areas needing improvement in site management.

Our field observations involved multiple visits to the construction site, during which we methodically recorded various aspects of site management. We employed a systematic approach to observation, drawing on established criteria and best practices in construction management. This allowed for a thorough and unbiased evaluation of the site's operations.

The methodology for the field observations included a direct visual inspection of the site and a review of project documentation when available. This approach ensured a comprehensive understanding of the on-site management practices and their effectiveness. The main findings from our detailed field observations are presented below, providing insights into key aspects of site management that require attention:

- **Waste Management and Safety Concerns:**

Our observations revealed extensive waste scattered across the construction site floor. This creates an untidy and hazardous work environment and significantly increases the risk of injuries, particularly in the absence of personal protective equipment (PPE) usage among construction workers. The lack of PPE is a critical concern, as it exposes workers to potential harm and reflects a disregard for standard safety practices. This situation is further compounded by a widespread lack of knowledge and awareness about the risks of poor waste management, as noted by [20]. Their study highlights that both the local population and workers often have limited understanding of the dangers associated with improper waste handling, a situation likely exacerbated by the low level of education and the insufficient emphasis on awareness campaigns in Somaliland. This lack of awareness heavily impacts waste collection and disposal operations on construction sites, contributing to the unsafe conditions observed. Addressing this knowledge gap and increasing awareness among workers and the local community about proper waste management practices are essential to improving site safety and environmental health.

- **Material Storage Issues:**

We observed that construction materials were frequently stored improperly on the site, with materials often left exposed to weather conditions and rain, risking damage and degradation. This indicates a lack of adherence to proper storage protocols and could lead to increased costs due to material spoilage or the need for replacement. The importance of effective material management is further emphasized by a study conducted in Mogadishu, Somalia, by [21], which identified material-related issues as the most significant cause of construction activity cost overruns. The study highlights that selecting the winning supplier based on a lower price often leads to a lack of materials in the local market, exacerbated by the absence of dependable suppliers. This situation is particularly crucial when considering the scale and demands of the work.

According to a study by Fashina et al. [22], issues related to materials, such as increase/fluctuation in prices and procurement difficulties (Lateness), are among the most influential delay factors in construction projects in Hargeisa. Furthermore, the study highlights the shortage/lack of materials in the marketplace as a significant factor in project delays. These findings underscore the importance of proper storage and management of construction materials. Ensuring effective storage practices is essential for maintaining the integrity and usability of materials and mitigating the broader challenges of material cost fluctuations and availability, thereby ensuring the smooth progression of the construction project.

These findings underscore the critical nature of proper material storage and management practices in construction projects. Effective storage practices are essential for maintaining the integrity and usability of materials and mitigating broader challenges, such as material availability and cost fluctuations. Ensuring that materials are stored correctly, and that supplier selection is based on reliability and quality rather than solely on price can significantly contribute to construction projects' smooth progression and cost-effectiveness.

- **Lack of Occupational Health and Safety Oversight:**

A notable finding was the absence of Occupational Health and Safety (OHS) officers on the construction site. This situation mirrors the broader challenges observed in regions like Somaliland, where national occupational health and safety policies or standards are not well-established or enforced. As highlighted in the study by Fashina et al. [3], the lack of OHS oversight in construction projects is a significant concern, as it often leads to insufficient measures to ensure worker safety and health. The absence of such oversight in Somaliland's construction sector underscores the critical need to develop and implement comprehensive OHS policies and

standards. Establishing these policies is essential for safeguarding the well-being of construction workers and other stakeholders in the industry, ensuring that health and safety are prioritized and effectively managed on construction sites.

This study conducted an in-depth site investigation of a public construction project in Hargeisa, Somaliland, focusing on six key practices for site management. The main findings from this investigation are as follows:

- Management, Supervision, and Administration: Meetings are held sporadically, only deemed necessary, lacking regularity and formal structure. Workforce allocations are conducted informally without a standardized process. Progress reports are generated on an ad-hoc basis only upon request, indicating a lack of proactive project monitoring. Furthermore, there is no established format for sharing technical information, suggesting gaps in communication and information dissemination.

- Commercial Management: There is a noticeable absence of a structured cost control system. This lack of a formal system for monitoring and managing costs may lead to inefficiencies and budget overruns, highlighting a critical area for improvement in commercial management practices.

- Legal, Health, and Safety Management: The contractor has not implemented any formal health and safety policy, and the use of insurance is limited. Workers are observed performing tasks without proper safety equipment or training, indicating significant shortcomings in health and safety management. This exposes workers to potential hazards and reflects non-compliance with safety standards.

- Planning: Essential planning activities, such as creating work breakdown structures, work program development with bar diagrams, and resource leveling, are only partially executed. This incomplete planning process can lead to inefficiencies and challenges in project execution.

- Delivery and Storage of Materials: While some storage facilities are provided, they are inadequate for the project's needs. Materials are frequently left exposed to environmental elements, risking damage. This highlights deficiencies in the management and protection of construction materials.

- On-site Production Management: There is a lack of formal quality control and quality assurance plans. This absence suggests potential risks to the project's quality outcomes and underscores the need for more robust quality management processes.

The study employed site observations to systematically assess the six key site management practices. Data was collected through direct observation and analysis of available project documentation. The methods were chosen based on their alignment with best practices in construction management research and were supported by previously published references to ensure reliability and validity. This comprehensive approach allowed for a detailed assessment of site management practices and contributed to the reproducibility of the study.

In addition to the detailed observations, our findings are further elucidated in Table 1, titled 'Evaluation of the sample project according to six construction site management practices.' This table systematically evaluates the construction site's adherence to each of the six key practices. It categorizes the practices into 'Performed,' 'Partially Performed,' and 'Not Performed,' offering a clear visual representation of the project's strengths and areas for improvement.

Table 1. Evaluation of the sample project according to six practices of construction site management

Application	Work Definition	Performed	Partially Performed	Not Performed
1. Management, Supervision, and Administration of Construction Sites	1.1. Planning of meeting arrangements		√	
	1.2. Making labor allocations	√		
	1.3. Progress reporting		√	
	1.4. Technical information sharing			√
2. Commercial Management of Construction Sites	2.1. Making cost estimates	√		
	2.2. Cost-value reconciliation			√
	2.3. Implementation of cost control system			√
3. Legal, Health, and Safety Management	3.1. Health and safety policy			√
	3.2. Insurance			√
	3.3. Building Regulations			√
	3.4. Providing health and safety training to staff			√
4. Planning, Monitoring and Control	4.1. Making the work breakdown structure (WBS)		√	
	4.2. Preparation of the work program		√	
	4.3. Resource leveling		√	
5. Delivery and Storage of Materials	5.1. Management of material requests	√		
	5.2. Management of material deliveries	√		
	5.3. Proper storage of materials		√	
6. On-site Production Management	6.1. Quality control policy			√
	6.2. Quality assurance plan			√

Key findings from Table 1 include:

- In 'Management, Supervision, and Administration of Construction Sites,' labor allocations were regularly performed while planning of meeting arrangements and progress reporting were only partially performed. Technical information sharing was not observed at all.
- 'Commercial Management of Construction Sites' revealed that cost estimates were made, but cost control systems or cost-value reconciliation were not implemented.
- For 'Legal, Health and Safety Management,' none of the evaluated practices, including health and safety policy, insurance, building regulations, or staff training, were implemented.
- 'Planning, Monitoring and Control' showed partial implementation in work breakdown structure, work program preparation, and resource leveling.
- In 'Delivery and Storage of Materials,' management of material requests and deliveries were performed, but proper storage of materials was only partially implemented.
- 'On-site Production Management' lacked a quality control policy and assurance plan.

The results from Table 1 underscore the project's significant shortcomings in several critical site management practices, particularly in legal, health and safety management, and on-site production management.

In summary, the findings from this comprehensive site investigation reveal significant shortcomings in several key areas of construction site management in Hargeisa. Notable issues include inadequate waste management and safety protocols, improper storage and handling of materials, and a lack of structured management practices across various domains, including commercial management, planning, and on-site production management. The absence of Occupational Health and Safety officers and the lack of formal health and safety policies further exacerbate these challenges.

These observations point to a pressing need for general improvements in construction site management practices in Hargeisa and Somaliland. Addressing these gaps is essential for enhancing the efficiency, safety, and overall success of construction projects in the region. The findings underscore adopting more systematic and effective management approaches, including implementing safety standards, proper material management, and structured administrative procedures.

Drawing attention to these critical issues, this study contributes to a deeper understanding of the current state of construction site management in Hargeisa. It provides a foundation for future efforts to improve practices in the region. Concerted action is required to address these challenges to ensure the successful completion of construction projects and safeguard the well-being of workers and stakeholders involved.

4. Conclusion

In conclusion, this study has shed light on the significant areas needing improvement in construction site management practices in Hargeisa. Our findings resonate with those from similar studies in other regions, highlighting universal challenges in construction management. For instance, similar to insights from the Nigerian construction industry [4], we identify inadequacies in enforcing building regulations as a critical issue. Furthermore, the Nigerian study points to the negative impact of poor communication within contractors' organizations, a challenge we also observed in Hargeisa. This reinforces the need for effective communication and information sharing for efficient site management.

Additionally, the emphasis in [4] on self-motivation and team spirit for successful project execution mirrors our findings in Hargeisa, suggesting a universally beneficial approach towards more humane and encouraging management styles in construction. This comparative analysis corroborates our findings and indicates broader systemic issues in construction site management that transcend geographical boundaries. Moreover, our study aligns with research conducted by [23] on public building construction projects in Ethiopia, which found that effective materials management practices, including construction material testing, planning, transportation, and handling systems, are crucial for project success. This study also highlighted slow responses from consultant engineers and ineffective procurement processes as primary root causes of materials management problems, paralleling issues we observed in Hargeisa. These insights emphasize the importance of efficient material management and well-planned site layout as key mitigation measures.

In summary, our research contributes to the growing body of knowledge in construction site management, underscoring the necessity of a global perspective in addressing these challenges. Future research should continue to explore parallels and differences across various geographical contexts, enriching our understanding and shaping effective strategies for construction site management globally. The findings from our study, supported by insights from similar studies, advocate for addressing common challenges such as regulatory enforcement, effective communication, positive leadership, and efficient material management to improve construction project efficiency and safety worldwide.

Author Contributions

The third author actively contributed to the editing and revision of the article, ensuring that the research findings and arguments were presented in a clear, coherent, and accurate way. The second author conceptualized the research topic, offered intellectual direction throughout the project, and significantly improved the composition and organization of the manuscript. The first author conducted data collection and analysis and wrote the manuscript with support from the second and third authors.

Conflicts of Interest

All the authors declare no conflict of interest.

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