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Influence of Benchmarking Evaluation Approaches on the Performance of Housing Projects in Nairobi

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Abstract

Purpose: The study purpose is to determine the influence of benchmarking evaluation approaches on the performance of housing projects in Nairobi. Projects, including construction, aim to meet diverse stakeholder needs and are evaluated based on quality, time, and cost. The Project Management Institute (PMI) asserts that successful projects must be completed within budget, on schedule, and to the desired quality. Globally, many struggle to meet these benchmarks. Benchmarking evaluation approaches significantly influence housing project performance, yet their absence often leads to inefficiencies, cost overruns, delays, and quality issues. This study assessed the impact of benchmarking on housing projects in Nairobi, guided by Construction Management Theory.

Methodology: A descriptive research design was used, targeting 127 projects by 15 real estate developers between 2019–2024. Data were collected from 254 registered architects using structured questionnaires and analyzed using SPSS to generate descriptive and inferential statistics.

Findings: Findings indicate strong organizational commitment to benchmarking, which positively influences project performance, decision-making, and strategic planning. However, barriers such as limited training, system integration issues, and weak policy influence hinder full adoption.

Unique Contribution to Theory, Policy and Practice: The study recommends the alignment of bench marking evaluation approaches with Kenya's affordable housing program and international standards (e.g., UN-Habitat guidelines).

Keywords: *Benchmarking, Housing Projects, Project Performance, Construction Management*

1.0 Background of the Study

Projects are considered as the pursuit of any undertaking that meets the needs of different stakeholders, which includes construction projects (PMI, 2018). The construction projects' performance is often considered in terms of quality, schedule, and cost. Project Management Institute (PMI) acknowledges that successful projects are finished within budget, on time, and meets the desired quality. Across the world, different projects struggle to meet these performance parameters. In the Construction Extension of the Project Management Body of Knowledge (PMBOK), it is noted that most construction projects are unique because they are fraught with uncertainty and are often highly complex, especially because of the complex project environment. They are expected to respond to the different weather, site, economic, community, and physical conditions prevalent at the times of execution. As such, these projects inherently complete beyond the time schedule and outside the budget.

In other parts of the world, the same pattern is replicated. Niazi & Painting (2017) acknowledge the challenge of effective project evaluation approaches that leads to time delays and cost overruns in construction projects in Afghanistan, highlighting corruption, payments, and financing, among others, as the key factors. Shah (2016) noted that in Australia, project evaluation approaches are among the key factors, while in Ghana, payments and complexity are the key factors, and in Malaysia, contractor and management factors lead to time delays and cost overruns. Salunkhe & Patil (2014) and Singh (2017) acknowledge the persistence of time delays and cost overruns in construction projects in India. El Mansouri & Benchekroun (2018) acknowledge the same challenge in Hong Kong civil engineering projects. Qatar's construction projects also face the same time and cost overruns (Senouci, Ismail, & Eldin, 2016).

In Africa, the challenge has been extensively studied, but it is yet to be fully addressed. Ineffective project evaluation approaches have led to time delays and cost overruns that have continued to affect the performance of public projects, as is evidenced by the Ugandan Civil Aviation Authority (CAA) (Moyo & Msimang, 2021). Projects in Botswana, Egypt, Zambia, and South Africa face the persistent challenge of effective project evaluation. Saleh et al. (2019) highlighted the causes of delay in construction projects in Libya, noting that it affects the performance of the projects and is often linked to project evaluation approaches. The challenge is experienced in Nigeria (Aibinu & Odeyinka, 2016; Amusan, Dolapo, & Joshua, 2017).

In another study, Gituro & Mwawasi (2016) highlight that construction projects contribute to a country's economy in developing countries, and this has been a considerable challenge for project managers. They note that the Kenya National Highways Authority (KeNHA) has reported notable project evaluation challenges in their road construction projects. Mwangi & Wanjohi (2021) looked at the case of Meru County, Njiru & Otieno (2023) looked at the large construction projects in Kenya, and Seboru (2015) looked at the road construction projects in Kenya. Nzingu & Karanja (2018) acknowledged that checking and evaluation are critical to the success of residential

construction, especially acknowledging the challenge of proper planning and budgeting. Kihoro and Waiganjo (2015) looked at the factors affecting the performance of gated community housing projects in Nairobi. The researchers acknowledge that housing projects need to consider planning, the project team's competence, and stakeholder management if they need to boost the projects' performance.

In the recent past, the government of Kenya has embarked on a renewed focus on the construction industry. The focus has been heightened by the government's Big 4 Agenda which has placed affordable housing and infrastructure at the centre of the country's economy. With such a focus from the government, the county governments and the private sector have taken up different initiatives to support and participate in the development agenda. The construction industry in Kenya has been examined before (Boru, 2016; Gituro & Mwawasi, 2016; Kwatsima, 2016; Seboru, 2015), but there is a lack of sufficient focus on the performance of housing projects in Nairobi. Sector-specific research is necessary to understand the influence of project evaluation approaches on the project's time and cost performance. The benchmarking evaluation approaches need to be examined, especially focusing on their influence on housing projects' success, which has not been done before. As such, it is necessary to study the construction sector because its unique environment poses different challenges to the performance of construction projects.

1.2 Statement of the Problem

The project evaluation approaches, specifically benchmarking have a substantial influence on the performance of housing projects. The lack of proper project benchmarking has continually led to the poor performance of construction projects as given by (Oladipo et al., 2015). Lack of proper project benchmarking significantly impacts the performance of housing projects by leading to inefficiencies and suboptimal outcomes. Without benchmarking, it is challenging to set realistic performance targets or measure progress accurately, resulting in potential cost overruns, delays, and quality issues. Benchmarking provides critical insights into best practices and industry standards, helping to identify gaps and areas for improvement (Saleh et al., 2018).

A literature review reveals that several road construction projects still register poor performance related to the project evaluation approaches (Boru, 2016; Durdyev, Omarov, & Ismail, 2017; Gituro & Mwawasi, 2016; Kwatsima, 2016; Seboru, 2015). Ochenge (2018) acknowledged that the performance of road infrastructure projects was significantly affected by project evaluation approaches. These studies have primarily focused on road projects and do not offer insights into housing construction projects. While the reviewed studies have examined the link between project evaluation approaches and the performance of construction projects, the studies focusing on the influence of benchmarking approaches on the performance of housing projects in Nairobi were scarce.

This study addresses these gaps by investigating how benchmarking approaches influence the performance of housing projects in Nairobi. By identifying and profiling ongoing and completed

housing projects, the research provides actionable insights for improving project delivery. The findings contributed to better decision-making in housing project management, ultimately supporting sustainable urban development in Nairobi.

1.2 Objective of the Study

To assess the influence of benchmarking evaluation approaches on the performance of housing projects in Nairobi.

2.0 Literature Review

2.1 Application of Construction Management Theory in Benchmarking Evaluation Approaches

Construction Management Theory has evolved through significant contributions from various scholars and institutions. Early 20th-century industrial engineer Henry Gantt is one of the notable proponents, known for the Gantt chart, a tool essential for project scheduling. The Project Management Institute (PMI), established in 1969, formalized many principles of project management, publishing the first "A Guide to the Project Management Body of Knowledge (PMBOK Guide)" in 1996. Harold Kerzner, through his extensive work and publications in the late 20th and early 21st centuries, further advanced methodologies and practices within the field (Saleh et al., 2018).

The key tenets of Construction Management Theory include the integration of project phases, efficient resource management, strict time management, cost control, quality assurance, risk management, and effective communication (Senouci et al., 2016). These principles advocate for a structured approach to managing construction projects, emphasizing detailed planning, monitoring, and controlling activities to achieve project objectives within defined constraints.

In studying the influence of project evaluation approaches on the performance of housing development projects, Construction Management Theory provides a robust framework for analyzing various performance metrics. Its emphasis on integrated project phases and systematic resource, cost, and risk management is essential for comprehensive project evaluations. By applying these principles, evaluators can systematically assess project adherence to schedules, budgets, quality standards, and risk mitigation strategies (Müller & Schütze, 2019).

2.2 Empirical Literature Review

A comprehensive study by Smith et al. (2018) investigated the impact of benchmarking on housing project performance in the United States. The research utilized a mixed-method approach, combining quantitative data analysis of project performance metrics from 50 housing projects with qualitative interviews of project managers. The study found that projects implementing benchmarking practices showed significant improvements in cost efficiency and time management. The methodology involved comparing project performance before and after the

introduction of benchmarking, revealing a 15% reduction in project delays and a 10% reduction in overall costs.

In South Africa, a study by Nkosi & Louw (2017) assessed the influence of benchmarking on the performance of low-cost housing projects. Using a mixed-method approach, the study combined quantitative performance data from 30 projects with qualitative insights from interviews with project managers and residents. The research showed that benchmarking led to improved project delivery times and higher resident satisfaction levels.

Similarly, in Nigeria, Adeyemi & Fagbenle (2016) examined the impact of benchmarking on the quality and efficiency of housing projects. Their methodology involved a survey of 40 housing projects and interviews with construction professionals. The study found that projects incorporating benchmarking practices saw a 10% improvement in quality and a 7% reduction in construction costs.

A study by Mwangi & Wanjohi (2021) investigated the application of benchmarking in housing projects in Nairobi. The researchers employed a case study approach, focusing on ten housing projects that had adopted benchmarking practices. Data collection involved performance metric analysis, stakeholder interviews, and site visits. The study concluded that benchmarking contributed to a 14% improvement in project delivery times and enhanced overall project quality.

Kamau & Njenga (2023) conducted a study on the role of benchmarking in public housing projects in Kenya. Using a mixed-method approach, the study combined quantitative data from project performance reports with qualitative interviews with project managers and government officials. The findings indicated that benchmarking practices led to a 9% reduction in project costs and improved adherence to project schedules.

3.0 Methodology

3.1 Research Design

The research design adopted in the study was a descriptive research design based on the nature of the data collection tools used and the type of data that was collected by the study. A descriptive study is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way in order to get a general overview about the subject of investigation (Obwatho, 2014).

3.2 Population

The population targeted in this study was 127 housing construction projects within Nairobi City County under 15 real estate developers with projects between 2019 and 2024. There were 254 respondents from registered architects from the construction project. The housing project was for those with over Kshs. 100 million and above and have Registered Architects. The study therefore went for at least 2 Registered Architects in each project.

3.3 Sampling

The research adopted systematic random sampling in reaching out to the study respondents. This is because of the nature of the organization structure for housing projects where one project may consist of very many technical personnel and their representatives. The study therefore utilized Yamane (1967) formulae for sample size calculations:

The Yamane (1967) formula for sample size:

$$n = \frac{\mathrm{N}}{1 + N(€^2)}$$

Where:

N= Total populations

n= required sample population

€=significance level of 5%

Therefore:

$$= \frac{254}{1 + 254\ (0.05^2)}$$

Sample size n = 155

The researcher then collected data from 155 architects based on professional categories from selected housing projects based in Nairobi.

3.4 Data Collection Methods and Tools

3.4.1 Data Collection Method

The collection of the data was done using questionnaires as the main source of data for the study. The data collection process was a primary data collection method that employed the usage of structured questionnaires that were designed according to the study objective administered by trained research assistants.

3.4.2 Data Collection Tools

The study used a carefully constructed questionnaire to ensure that the respondents provided information about the issues they had detailed knowledge about. The questionnaires were structured according to the study objective, where closed questions were used. The likelihood of obtaining fully completed questionnaires was increased by the use of trained research assistants who had been trained on the content of the questionnaires in order to clarify to the respondents any section of the questionnaire that was unclear or ambiguous. The participants in the study were approached in their natural environment to make them more confident about disclosure.

3.5 Data Analysis and Presentation

The study employed a quantitative method of data analysis to present the results from the field. The questionnaire was composed of closed questions. In order to perform statistical analysis, the researcher used quantitative data that was transformed into numerical form for ease of analysis. Data from surveys with closed-ended questions measured using Likert scales were translated into numeric data and ranked on a 1–5 scale based on the relative importance of the constructs under evaluation. First, the questionnaires collected from the field were subjected to an editing process to check for errors and omissions; this was followed by coding. The data entry was then done in SPSS to compute the generated descriptive statistics such as mean scores and standard deviations for each variable, both dependent and independent. Frequencies and percentages were computed to highlight the demographic information of the participants according to their role in the organization, age, gender, marital status, and education. The Pearson Product-Moment Correlation Coefficient was calculated to establish the relationships that existed among the independent and dependent variables. The study aimed to determine the associations among various study variables. Pearson Product Moment Correlation (r) was conducted in SPSS to establish whether there was a substantial link between the dependent and independent variables in the sampled data at a 95 percent level of confidence.

3.6 Ethical Issues

The researcher obtained a letter of authority from the Jaramogi Oginga Odinga University of Science and Technology Institutional Ethics Review Committee department, after which a similar letter was obtained from the National Commission for Science and Technology (NACOSTI). The researcher then used the letters of authority to collect data and seek permission from the relevant respondents of the respective housing construction companies. Once authority to collect data had been obtained from the respective companies, the staff identified to participate in the study were contacted and given a consent form to sign. The consent form outlined their rights, including their right not to participate in the study. In the consent form, they were also reminded that no respondent would be victimized on account of the information provided and that no one would be identified with any particular response, as the questionnaire was anonymous and did not capture any personal identifiers such as names or phone numbers. For interested parties, the study results were to be shared once the study had been published.

4.0 Analysis and Presentation of Findings

4.1 Response Rate

The number of questionnaires that were administered was 155. A total of 128 questionnaires were duly filled and returned as indicated in Table 4.1. This represented an overall successful response rate of 83 %, which is good enough to serve as a representative of the population. This conforms to Babbie (2004) asserted that response rates of 50% are acceptable to analyse and publish, 60%

is good and 70% is very good and based on this assertion 83% response rate was found to be adequate for the study.

4.3 Demographic Characteristics

The study analysed the demographic characteristics of the respondents in terms of age brackets, gender, level of education, and profession to enable the researcher know the respondents characteristics and assess whether the respondents possessed information relevant to the study in line with level of education and professionalism and the results were as follows;

4.3.1 Age Distribution of Respondents

The age distribution of respondents indicates that the majority, 53% (n=68), fall within the 36-45 age range. The 26-35 group accounts for 25.78% (n=33), showing a strong presence of younger professionals. Moreover, the 18-25 makes up 10.94% (n=14) while the 56 and above age groups make up 10.16% (13). This distribution suggests that the workforce is dominated by mid-career professionals, with a smaller but notable presence of younger and older individuals, reflecting a mix of experience and emerging talent in the field.

4.3.2 Gender of the Respondents

The respondents were asked to indicate their gender. Results in Figure 4.2 reveal that the majority (84%, n=108) of the respondents were male, while 16% (n=20) were female. This implies that most of the employees working in the construction sector are male. However, the number of female employees in the building industry is reasonable as the number is not very low.

4.3.3 Education Level of the Respondents

The findings indicate that the majority of respondents (67.19%, n=86) held a Bachelor's degree, highlighting a highly educated sample population. Diploma holders made up 17.96% (n=23), while those with a Master's degree accounted for 9.38% (n=12). Respondents with a Doctorate were 3.91% (n=5), and only 1.56% (n=2) had other forms of education. This distribution suggests that most participants possess substantial academic qualifications, likely equipping them with analytical and managerial competencies relevant to housing projects. The high concentration of degree holders enhances the credibility of the data, as their responses are presumed to reflect informed perspectives on project evaluation and performance in the housing sector.

4.3.4 Years of Experience in Housing Projects

The respondents were asked to indicate the number of years they had worked in their current employment. Results in Figure 4.3 reveal that 40.62% (n=52) of the respondents had worked in their current employment between 6 – 10 years, followed by those who had worked between 11 – 15 years (25%, n=32), those who had worked between 16-20 years accounted for 15.63%, (n=20) while employees with experience of 0-5 years were 12.5% (n=16). The study also revealed that respondents with over 20 years were 6.25 (n=8%). The results therefore indicate that the majority

of the respondents have adequate experience in the housing sector as they have worked for more than 6 years. The study results can then be relied upon as the respondents have experience and knowledge in the performance of housing projects in Nairobi, based on the duration they have worked in the industry.

4.4 Benchmarking Evaluation Approaches

The findings in Table 1 provide a detailed insight into the application and perception of benchmarking evaluation approaches within housing projects in Nairobi. For the statement, "Does your organization frequently use benchmarking evaluation approaches," a combined 78.91% agreed (43.75%, n=56) or strongly agreed (35.16%, n=45), indicating that benchmarking is a common practice. However, 6.25% (n=8) strongly disagreed and 6.25% (n=8) disagreed, suggesting limited adoption in a few organizations. A further 8.59% (n=11) remained neutral, possibly reflecting uncertainty or inconsistency in application.

In terms of effectiveness, 81.24% of respondents either agreed (34.36%, n=44) or strongly agreed (46.88%, n=60) that benchmarking improves project performance, while only a small minority disagreed (6.26%, n=8), underscoring a strong belief in its positive outcomes. Similarly, 82.81% (agree: 39.06% n=50; strongly agree: 43.75% n=56) agreed that benchmarking helps in identifying best practices, suggesting its instrumental role in quality enhancement.

Technology appears to be fairly well-integrated into benchmarking processes. A combined 77.34% agreed (42.18% n=54) or strongly agreed (35.17% n=45) that technological tools are effectively used in benchmarking data collection. However, 8.59% (n=11) disagreed and 6.25% (n=8) strongly disagreed, indicating some gaps in digital adoption or capacity.

Regarding policy influence, 77.35% agreed (36.72%, n=47) or strongly agreed (40.62%, n=52) that benchmarking results have influenced housing project policies, although 7.03% (n=19) disagreed—suggesting that while benchmarking has shaped strategic direction in many cases, its policy penetration is not universal.

The benchmarking's practical outcomes are evident in the statement on improvements in planning, execution, and delivery timelines. Here, 78.13% (agree: 35.94%, n=46; strongly agree: 42.18%, n=54) supported this view. A small fraction disagreed 7.81% (n=10) or strongly disagreed 4.69% (n=6), indicating that not all organizations may be achieving intended efficiency gains.

The findings reflect a strong organizational commitment to benchmarking evaluation approaches across housing projects in Nairobi. The study reveals a positive perception of benchmarking's impact on performance, decision-making, and strategic planning. However, implementation barriers, technological gaps, and limited influence in some policy areas suggest the need for enhanced training, system integration, and leadership support to fully realize the potential of benchmarking in the housing sector.

Table 1: Benchmarking Evaluation Approaches

STATEMENTS		SD	D	N	A	SA	Totals
Does your organization frequently use benchmarking evaluation approaches.	Count	8	8	11	56	45	**128**
	%	6.25	6.25	8.59	43.75	35.16	**100**
Benchmarking evaluation approaches have significantly improved project performance.	Count	4	8	12	44	60	**128**
	%	3.125	6.26	9.376	34.36	46.88	**100**
Benchmarking helps in identifying best practices for our projects.	Count	5	7	10	50	56	**128**
	%	3.91	5.47	7.81	39.06	43.75	**100**
Technological tools (e.g., project management software, GIS mapping) are used effectively in the collection of benchmarking data.	Count	8	11	10	54	45	**128**
	%	6.25	8.59	7.81	42.18	35.17	**100**
Benchmarking evaluations are easy to implement in our organization.	Count	13	13	11	51	40	**128**
	%	10.16	10.16	8.59	39.84	31.25	**100**
The results of benchmarking evaluations are used to make informed project decisions.	Count	5	6	12	49	56	**128**
	%	3.91	4.69	9.38	38.27	43.75	**100**
Predictive models and historical project data are utilized to identify trends and risks in benchmarking of housing projects.	Count	5	7	12	48	56	**128**
	%	3.91	5.46	9.38	37.5	43.75	**100**
Findings from benchmarking influence policy adjustments in housing projects.	Count	6	9	14	47	52	**128**
	%	4.69	7.03	10.94	36.72	40.62	**100**
Benchmarking results contribute to improvements in project planning, execution, and delivery timelines.	Count	6	10	12	46	54	**128**
	%	4.69	7.81	9.38	35.94	42.18	**100**

5.0 Discussion of Key Findings and Recommendations

5.1 Demographic Information

Demographic information of the respondents was captured in terms of age, gender, level of education, and years of experience in housing projects. A total of 155 questionnaires were issued for the survey, and 128 were duly completed and returned. This represented a strong response rate, which was considered adequate for analysis and ensured that the data collected was representative of the target population. In terms of age, the majority of respondents were between 36 and 45 years old, indicating that most participants were mid-career professionals. This group was followed by individuals aged 26 to 35, then those between 18 and 25, while the smallest group consisted of respondents aged 56 years and above. This mix of age groups suggests a workforce comprising both experienced personnel and younger professionals, offering a balanced perspective on the sector. Regarding gender, the survey revealed that most of the respondents were male. However, a notable number of female participants were also represented, reflecting growing gender inclusivity in the construction and housing sector, despite its traditionally male dominance. On educational qualifications, the largest proportion of respondents held a Bachelor's degree, indicating that most of the participants were well-educated. This group was followed by diploma holders, then those with Master's degrees, with a few having Doctorate qualifications or other forms of education.

5.2 Benchmarking Evaluation Approaches

The findings of this study underscore a widespread adoption and positive perception of benchmarking evaluation approaches among housing projects in Nairobi. A majority of respondents acknowledged the frequent use of benchmarking within their organizations, suggesting that the approach is embedded in their operational strategies. This supports Mwangi and Wanjohi (2021), who found that Nairobi-based housing projects that applied benchmarking practices experienced notable improvements in delivery timelines and overall quality. Respondents largely agreed that benchmarking enhances project performance and helps in identifying best practices. These outcomes mirror the conclusions drawn by Smith et al. (2018), whose U.S.-based study demonstrated marked improvements in time management and cost efficiency through benchmarking. Likewise, Adeyemi and Fagbenle (2016) found that benchmarking in Nigerian housing projects led to better quality and cost savings, which aligns with the positive perceptions observed in this study.

In terms of the use of technology in benchmarking processes, the majority of participants affirmed that technological tools are being effectively applied in data collection. This resonates with findings by Li and Zhang (2020), who highlighted the role of data-driven benchmarking in enhancing quality and reducing project completion times. The confirmation of technological integration in the current study reinforces the idea that digital tools are becoming central to benchmarking processes in housing projects. However, the study also revealed a noticeable proportion of respondents who disagreed with statements regarding the ease of implementation.

Some participants reported difficulties, which may point to institutional or logistical constraints. This observation introduces a point of contrast with the literature, particularly with Kamau and Njenga (2023), who reported improved adherence to project schedules following benchmarking in Kenyan public housing. The current findings suggest that, while benchmarking is beneficial, implementation barriers still exist, potentially due to capacity or training deficiencies not addressed in earlier studies.

5.3 Recommendations

The study recommends the development of a dedicated national benchmarking framework tailored for the housing sector. Such a framework should outline clear guidelines, standardized indicators, and procedures for benchmarking at both project and institutional levels. It should be spearheaded jointly by the State Department for Housing and Urban Development and relevant county agencies, with active inclusion of professional bodies, developers, and civil society organizations to enhance buy-in and ensure contextual relevance.

5.4 Suggested Areas for Further Study

While benchmarking is recognized as valuable, gaps in institutional support and technical capacity hinder its consistent application. Future research could explore the specific institutional barriers, capacity deficits, and resource constraints affecting benchmarking adoption. This study could identify best practices for capacity building and institutional alignment to inform the design of tailored training programs and policy interventions that enhance benchmarking effectiveness across diverse housing organizations.

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