Determining Key Performance Indicators as a Tool in Managing Public Property Development Projects in The Niger Delta Region

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Abstract

Construction of public project is one aspect but the management of that project to handing over stage at the right time, within the initial budget and with the required quality is another aspect. For the management of government projects, it is required that project managers know about key performance. This paper accesses the key performance indicators as a tool that can be used in the management of public property development projects in the Niger Delta Region of Nigeria. The research adopted pragmatic research philosophy because it allows the use of multiple methods. Data was collected from professionals who have been involved in the development of public projects in the study area. One hundred and thirty semi-structured questionnaires were developed and distributed in the Niger Delta region; where Fifteen (15) persons were interviewed. Data collected was analysed with descriptive statistical tools using frequency, Relative Important Index and interpretative content analysis. The study established that there are different types of public property development projects in the study area and it also established methods of key performance indicators as a project management tools. The research observed that the understanding of these tools will reduce cost overrun, delay, and quality and increase the benefits in the built environment and sustain the contemporary public property development projects. The findings are valuable to policy makers, practitioners in Nigeria and scholars globally who are exploring performance measurement frameworks for public property development projects. The study recommends that government should go into the development of different types of public projects so as to increase the nation's economy and safe guide the citizens from suffering in any particular aspect of social needs. It also recommends that the adoption of key performance indicators as a tool in management pubic property development projects would reduce any challenges or difficulties that any project manager may face as the tool will enhance monitoring, evaluation and reporting of projects.

Keywords: Project management tools, public projects, key performance indicators tools, public projects.

Introduction

Project is defined as an endeavor in which human, material and financial resources organised in a novel way to undertake a unique scope of work. It comprises a given set of specifications within its cost and time constraints, thereby seeking to achieve a beneficial change which is defined by quantitative and qualitative objectives (Project Management Institute, 2019). According to Ali, (2010), project is a temporary endeavor (temporary means that the project has a definite ending point), undertaken to create a unique (unique means that the product or service differs in some distinguishing way) product or service. However, a project is said to be managed successfully when it is completed within the time, cost/ budget and expected quality delivery. According to Kuchta, Canonico, Capone and Capaldo, (2023), managing projects always have a lot of challenges and uncertainties and for these projects to be completed; tools used in managing these projects are required. Project management is one of the best tools needed in the development of property development projects, as it helps in ensuring the successful development of projects to completion (Kuchta, *et al.*, 2023). This is accomplished through the application and integration of the project management processes of initiation, planning, executing, monitoring and controlling and closing and the use of a project management tools (Mathenge, 2020).

Similarly, property development is referred to as the human-made surroundings that provide the setting for human activities, ranging in scale from personal shelter and buildings, to neighborhoods and cities that can often include their supporting infrastructure, such as; water supply or energy networks (Ogungbemi *et al.*, 2016).

Unfortunately, the rate of project management failure in Niger Delta and its magnitudes, such as cost overrun, is a fact, and has become a matter of concern (Igwe and Ude, 2018). Also, Kamarudden, (2020), states that only 16 per cent of 8,000 development projects in Nigeria were completed within budget, on time and at the required level of quality. However, some projects are successfully completed while others failed because they are not properly assessed, use of the right management tools in their peculiar and complex contexts (Amoah, and Marimon, 2021).

Development is as a result of price signals from property markets which depend on the estimated rental values based on the letting market evidence and estimated yield is based on investment market evidence (Ikiroko, *et al.,* 2023). Similarly, development is the act or result of developing; it is the systematic use of scientific and knowledge to meet specific objectives or requirements. From the definitions above, it shows the characteristics of development and the general aim and use of development therefore, property development is seen as a defined space which generates cash flow throughout its economic life span. The perception of users is based on the quality of use, rental price and service, while developers aim is for returns, preservation of value and liquidity (Wiegelmann, 2012). Also Ikiroko et al., (2023), defined property development as a process that involves improvement or increase in land use to provide building for accommodation. Development process is seen as a strategy which involves several actions and plans geared to achieving development objectives and value. The public sector is an enterprise that is charged with the provision of services on a supporting basis such as municipal utilities that provide water, waste, transportation, health and other series (Wirick, 2011). The public sectors provide services in different ways, although it is observed that most of these property development projects are outsourced to outsiders to execute. Thus, these services are divided into different ministries and agencies in the public sector; which some agencies are responsible for other agencies complying with the laws, rules and process requirements that have been put in place in the states; while some are responsible for the development of public projects, and others are responsible for the acquisition of properties (Wirick, 2011). Despite this different agency in the public sector, they all have some shared characteristics, particularly with regard to the management of their projects.

Public property development projects are projects funded by government, and they are owned or operated by the government. Similarly, Gazik, (2022), stated that Public property development projects are implemented by the decision of the central level government institution and as such is a temporary endeavor, undertaken, managed or overseen by one or more publicly funded organisations to create a unique product of fulfilling public purposes and they include: road repairs and constructions, public residential accommodations, schools, funding and managing of construction of submarines, providing of social security, providing electricity's, regulating consumer products, keeping peace, protecting properties, preserving natural landscapes, paying retirees and even maintaining public parks. All these projects mentioned above are important as they help a society to function well, although, irrespective of these, there is much confusions and disagreements over the proper role of governments and their fulfillment of public expectations. Hence according to Gasik, (2016); Gasik, (2022); Kassel, (2016), the following are the types of public property development projects and they include:

Transportation project: it is a capital projects that involve the construction and development of highways, bridges, motor carriers, land side improvements, rams, signal systems, road beds, pedestrian walk way, motor vehicles, rail, and others related to transportation.

Educational projects: it involves the development of primary, secondary, tertiary institutions and the implementation of e-learning platforms.

Healthcare projects: it is the development of new hospitals, renovation of public hospitals, and the implementation of electronic medical record systems, development of telemedicine platforms or introduction of new medical technologies (Prasain, 2023).

Recreational projects: Recreational projects are buildings or places developed mainly for indoor recreation, whether or not operated for the purposes of gain, including a squash court, indoor swimming pool, gymnasium, table tennis Centre, health studio, bowling alley and ice ring.

Agricultural projects: Agricultural project is the acquisition of stocks (including seeds or seedlings) and the preparation, planting, care and harvesting, whether owned or leased real property of crops for use as feedstock for any industrial projects owned and developed by government.

Housing/Residential accommodation projects: Residential project is the development of houses for residential purposes, a structure for commercial purposes and a space to stay. This could be in form of block of flats, detached houses, duplexes or terrace building and tenement building.

Governments are responsible for the social welfare and growth of a nation and its constituents cannot hold their governments responsible without having an access to a periodic reporting on how the country is going. And as such, without an understanding and evaluation of key performance indicators, governments cannot fulfill their commitment and responsibility in spending and transparency, and also, the public cannot verify if the required services are adequately performed. Thus, key performance indicator is defined in two aspects such as: reporting of important information to the citizens, and providing of information that describes the government's activities. Secondly, key performance indicators are compilations of data measures used to assess the performance of a development operation so as to evaluate and compare the actual and estimated performance in terms of effectiveness, efficiency and quality, both in workmanship and product (Velimirovic, Velimirovic & Stankovi, 2011). Similarly, KPI is a useful framework used in measuring and comparing project performance as without the use of these tools it is difficult to see the progress and the goals that are achieved, and also it measure the project's success by evaluating how well every stage of the development project is performed (Chan and Chan 2002 as cited in Stanitsas, Kirytopoulos and Leopoulos, 2021).

Recently, managers used different types of Key Performance Indicators to execute projects successfully, but in public property development project it is advice that before any key performance indicators is implemented that is should be agreed upon by all involved stakeholders, and it should be done before initiation phase and then measured and monitored as a tool for decision-making during the project (Traammell, 2023); (Yuan, Zeng, Skibniewski and Li, 2009). Ishaq Bhatti, Awan, & Razaq, (2014) in their study identified eight (8) tools of Key Performance Indicators such a: Job cost reporting, Time overrun, Quality of work, Health & safety, Resource management, Cost per unit, Rework/ quality control, and Motivation. Similarly, Traammell, (2023) opined that there are four tools of Key Performance Indicators such as: Timeliness, Budget, Quality and Effectiveness. According to Dobrowolska, (2022), Key Performance Indicators in public projects are split into two categories such as; qualitative and quantitative. The qualitative focuses on the aspects of the project that can be taken from numbers like cost variance, or labour costs, while the quantitative focuses on the abstract aspects of the projects, such as customer satisfaction.
Therefore, based on the reviews above, the following have been identified as the tools of key performance indicators used in the management of public property development projects, they include:

BUDGET KPI: This KPI is crucial to a successful development delivery, as it is essential to keep track of spending as it focuses on the difference between planned and actual project budget (Dobrowolska, 2022). Budget KPI involves budget variance, budget creation cycle, line items, number of budget repetitions, planed value, and cost performance index.
TIME KPI: One of the primary requirements particularly to public sector is to be able to predict the time for completion with some degree of reliability. Time KPI is making sure that the project is done on time and if it is not, tracking where it is off-target is important so that one can always have an estimated completion (Traammell, 2023). Time KPI involves the following; cycle time, on time completion percentage, time spent, number of adjustments, full time equivalent vs. calendar days, planed hours vs. time spent, resource capacity and resource conflict.
QUALITY KPI: it ***implies*** the amalgamation of client's satisfaction, architectural excellence, standard of finish, standard of materials used for the construction process and utility value (Kediashi*et al*., 2012). It also implies how well the project has progressed, if those working on it or benefiting from it are satisfied (Traammell, 2023).

RESOURCE MANAGEMENT KPI: This metric helps the manager to organize the team members by comparing the number of employees working on the project vs. their available time (Dobrowolska, 2022). Resource management is a viable tool for monitoring the material waste, prior to a change and then comparing that amount to the waste incurred after the initial change.
Many projects in the Niger Delta region keep failing, which results to the loss of millions, and it is as a result of lack of managing the persisting challenges that occur during the development processes which this study seeks to systematically investigate the management tools (Key Performance Indicators) which can be used in managing property development projects in the Niger Delta Region.
This research will help project management in developing countries specifically by addressing the persistent challenges of public property development projects in the Niger Delta region. Also the study provides evidence based insight on how tools of Key performance indicators can be applied to enhance public project success. Thus the research bridges the gap between theoretical models of project success and practical realistic in a political and economically complex environment. Thus the aim and objective of the study is to access key performance indicators as a tool used in managing public property development projects in the Niger Delta Region.

Methodology

This research study adopted pragmatic research philosophy, with a case study research design which allows the use of qualitative and quantitative methods. Data were collected through interview and self-administered semi-structured questionnaires to professionals involved in public property development projects in the three geographical states (Bayelsa state, Delta state and Rivers state) of Niger Delta Region. 255 questionnaires was distributed and sampled but 130 questionnaires were retrieved and used in analyzing the results which represents 51.1% of the respondent's rate and 15 real estate developers were interviewed. The distribution of questionnaires was done equally based on simple random sampling , a total of 85 each from Estate Surveyors and Valuers, Quantity Surveyors, Engineers, Architects, Project Managers especially those who are responsible for the development of public projects. Data was analysed using relative important index, descriptive statistics and interpretative thematic analysis using statistical package of social sciences (SPSS Var. 2021).

Results

From the review, interview and questionnaire, the following themes emerged from the result of the analysis and discussed below:

Public Property Development Projects

In this theme, the study considers the various types of public property development projects in the Niger Delta Region and the following are discussed below which were identified as the types of public property development projects in the Niger Delta Region and the results were generated using frequency analysis approach.

Types of public property development projects in the Niger Delta Region

1. ***Transportation projects***

In this section, the study seeks to underscore whether transportation projects are a type of public property development projects or not.

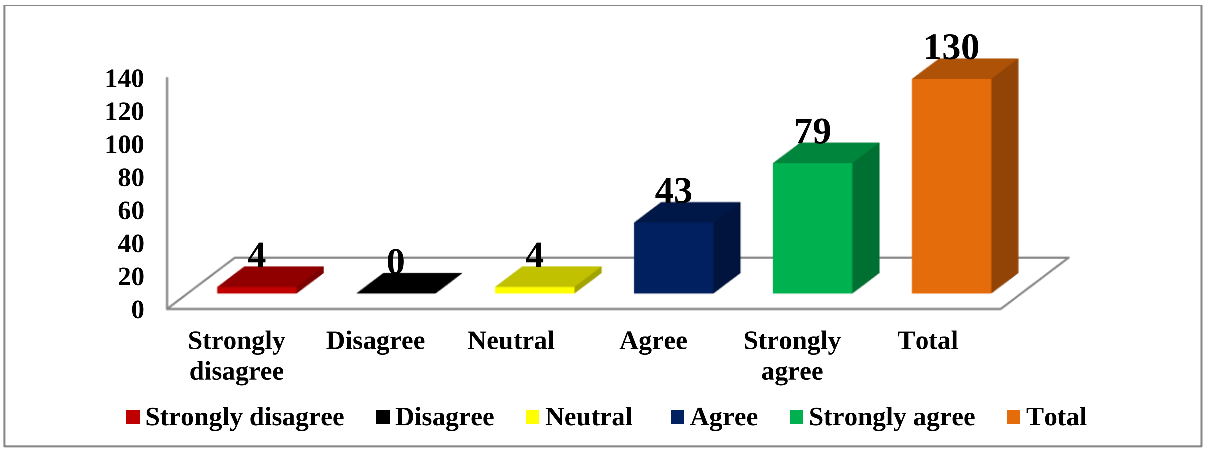

Figure 1.1 Transportation Projects
Source: Field Survey, (2025)

From the quantitative analysis in table 4.1 above, it shows that 96.9% of the respondents strongly agree or agree that transportation projects is a type of public property development projects in the Niger Delta region.
"…Transportation project, which comprises all of the means of transport, is a very important type of public project, and most elected governments in the Niger Delta region always include it in their agenda…" (Transcribed interview 2025)
Another interviewee explained that "…Good transportation system is counted in some countries as part of development, and therefore it is a public project, executed by most government in the Niger Delta region…" (Transcribed interview 2025)
Both quantitative and qualitative analyses revealed and confirmed that transportation projects are a type of public property development projects.

2 *Educational projects*
The study in this section seeks to underscore whether education projects are a type of public property development projects or not as shown below in figure 1.2

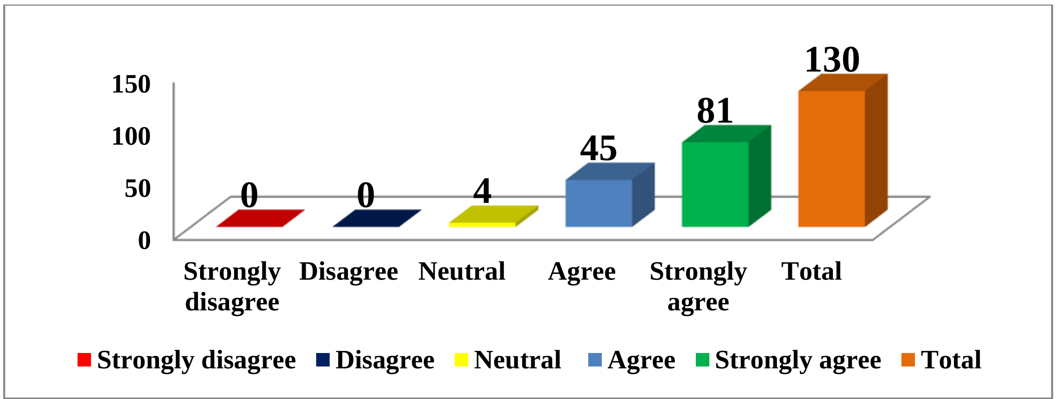

Figure 1.2 Educational Projects
Source: Field Survey, (2025)

The analysis shows that 100% of the respondents strongly agree or agree that Educational projects are a type of public property development projects.
"…Education is one of the most important sectors in every country, and as such it is a type of public property development project that are executed by governments in the Niger Delta Region..." (Transcribed interview 2025)
From both quantitative and qualitative analyses it is revealed and confirmed that education projects are a type of public property development projects.

3 *Recreational projects*
In this section, the study pursues to demonstrate whether the respondents consider recreational projects as a type of public property development projects or not as shown in figure1.3 below:

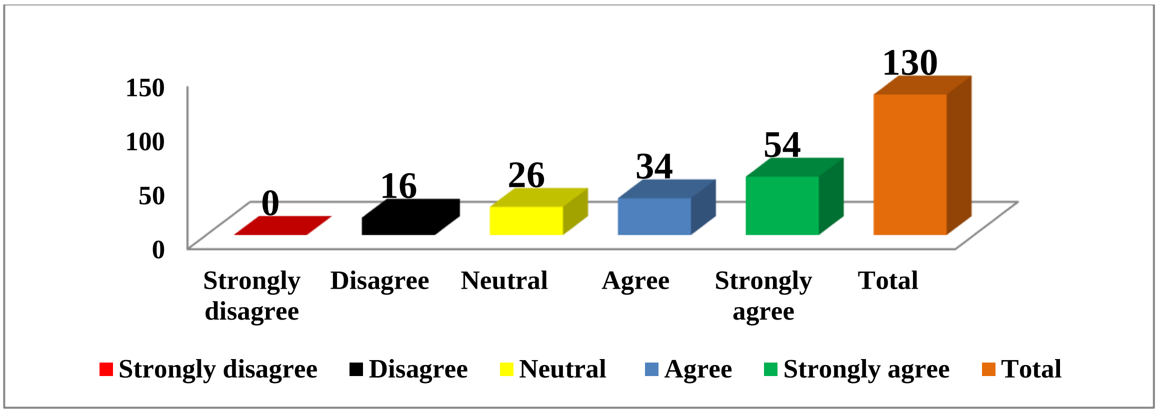

Figure 1.3 Recreational Projects
Source: Field Survey, (2025)

From the quantitative analysis, it shows that 87.7% of the respondents strongly agree or agree that recreational project is a type of public property development project in the Niger Delta Region.
However, from the qualitative analysis six (10) of the interviewees stated that recreational projects are a type of public property development projects which considered by governments, while four (5) of the interviewees said that they are a type of public projects, but that in the Niger Delta region they are not mostly developed that is why most of this type of projects are privately owned or through private and public partnership.
From both quantitative and qualitative analyses it is revealed and confirmed that recreational projects are a type of public property development projects.

4 *Agricultural projects*
In this section, the study seeks to underscore whether agricultural projects are a type of public property development projects or not as shown in figure 1.4 below:

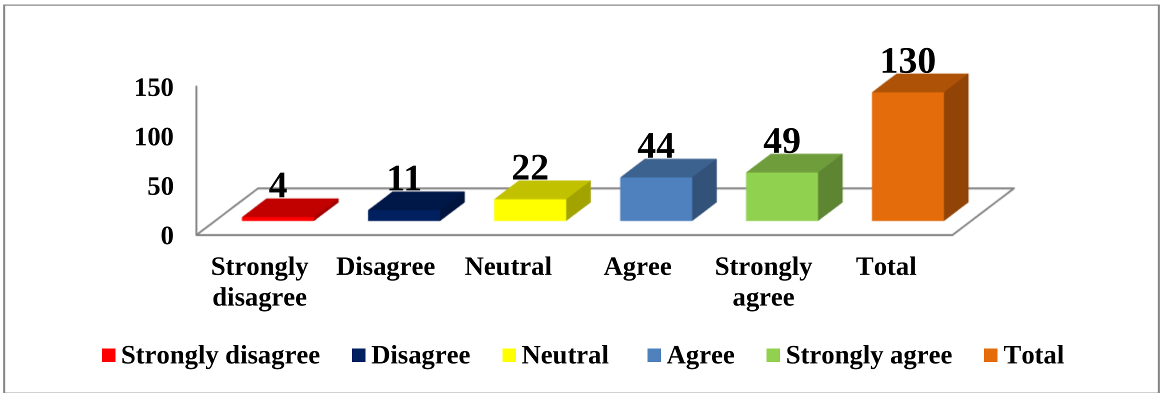

Figure 1.4 Agricultural Projects
Source: Field Survey, (2025)

From the quantitative analysis, it shows that 88.5% of the respondents strongly agree or agree that agricultural projects are a type of public property development projects.
"…Food is important in a particular nation, where there is hunger and starvation there is a problem. Agricultural project is one of the types of public property development project and they are always considered in every country budgets…" (Transcribed interview 2025) However, some interviewee opined that these types of property development projects are neglected by most government in the Niger Delta region.
From both quantitative and qualitative analyses it is revealed and confirmed that agricultural project is a type of public property development projects.

5 Housing/Residential Projects
The study in this section seeks to underscore whether residential projects are a type of public property development projects or not as shown below in figure 1.5.

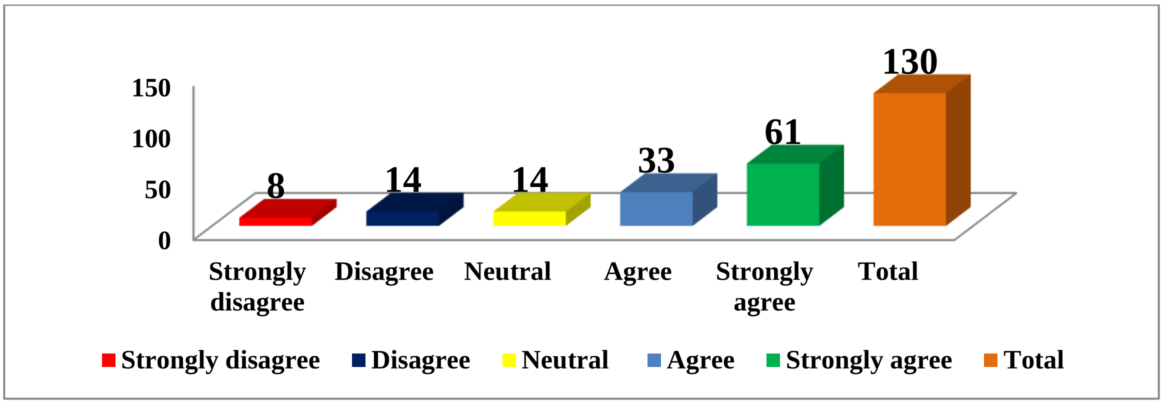

Figure 1.5Housing/Residential Projects
Source: Field Survey, (2025)

From the quantitative analysis it therefore shows that 83.1% of the respondents strongly agree or agree that accommodation projects are a type of public property development projects.
However, from the qualitative "…this sector is another area that government tend to consider by developing low cost accommodation for their staffs, but there is still need for more to be developed in the Niger Delta region… (Transcribed interview 2025)
From both quantitative and qualitative analyses, it is revealed and confirmed that accommodation project is a type of public property development projects.

Key performance indicators as a tool used in managing public projects
In this section, the study considers the various types of Key Performance Indicators as tools used in developing public property development projects in the Niger Delta Region and the following are discussed. The data presentation involves the use of relative important index for interpretation of result; Table1 below will be adopted in judging the strengths of the respondents and ranking (Pallant, 2013).
Ranking the Key Performance indicator tools used in managing public property development projects is emerged below, in table 4.2 was computed using the frequency analysis. Results were provided in a ranking order so as to determine which of the Key Performance indicator is more critical.
RII = (n1 + 2n2+3n3+4n4+5n5)/5N
Where:
n1 = number of respondents that answers strongly disagree;
n2 = number of respondents that answered disagree;
n3 = number of respondents that answered neutral;
n4 = number of respondents that answered agree;
n5 = number of respondents that answered strongly agree;
N = total number of respondents = 130.

Table 1 Guide to judgment strength of analysis

Range	Judgment
0.00- 0.29	Very weak
0.30 - 0.39	Weak
0.40 - 0.59	Moderate
0.60 - 0.79	Strong
0.80 - 1.00	Very strong

Source: Pallant, (2013) as cited in Orlu & Ihuah, (2021)

Types of Key Performance Indicators in Managing Public Projects	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	RII Values	Ranking
Budget KPI	2	8	12	168	390	0.892	1st
Quality KPI	0	8	66	112	380	0.871	2nd
Time KPI	0	24	36	192	290	0.834	3rd
Resource Management KPI	0	28	36	200	270	0.822	4th

Source: field survey (2025)

Table2 above, outlined the result on the key performance indicators as a tool that can be used in the management of public property development projects. The Table shows that Budget KPI with 0.892 RII Values, indicates that 89.2% of respondents very strongly agree that it is a type of Key Performance Indicators as it (ranked 1st). This showed that it is the most critical tool that can be used in managing public project

"…budget involves a lot of things in projects, it connotes finances, and cost which if implemented it will help in project delivery and controlling cost overrun…." (Transcribed interview 2025)

Another interviewer stated that "…budget KPI is the most critical tool that can be used in managing public projects as government projects in the Niger Delta region tend to be abandoned due to over budgeting or under budgeting …" (Transcribed interview 2025)

Quality KPI has an RII value of 0.834 which indicates that 83.4% of respondents very strongly agree that it is a type of Key Performance Indicators as it (ranked 3rd). This showed that it is the third on the list and it is considered as a tool used in managing public project based on the decision rule shown in Table 1.

"… If a project is not delivered in the quality that the owner requires it has a negative effect on the developer as the client was not satisfied with the work delivered. Therefore, quality KPI is another tool that every property developer should consider during the development of Public projects …" (Transcribed interview 2025)

Time KPI has an RII value of 0.871 which indicates that 87.1% of respondents very strongly agree that it is a type of Key Performance Indicators as it (ranked 2nd). This showed that it is the third on the list and it considered as a tool used in managing public project based on the decision rule shown in Table 1

"… Timing is efficient and effective in property development projects and this is seen as one of the problems that is faced in the development of public projects in the Niger Delta region. Adopting the Time KPI as a tool used in managing public projects, projects will be delivered on time…" (Transcribed interview 2025)

Resource management KPI has an RII value of 0.822 which indicates that 82.2% of respondents very strongly agree that it is a type of Key Performance Indicators as it (ranked 3rd). This showed that it is the fourth on the list and it considered as a tool that can be used in managing public project based on the decision rule shown in Table 1

"…Resource management KPI involves a lot of things in projects and is a tool that can be used in managing public projects. Most public projects are known for misappropriation of resources as proper records are not done but it shows inefficiency and lack of transparency. Therefore, implementation of this tool will help to stop those issues…" (Transcribed interview 2025)

The finding is supported with (Traammell, 2023); Kediashi*et al.*, (2012) who mentioned that the above are key performance indicators as tools used in the management of public property development projects.

Therefore, these will serve as a tool that can be used in managing public projects for successful implementation and development of public projects, thereby enhancing the decisions of all stakeholders involved.

Conclusion

The study established that there are five (5) types of public property development projects in the Niger Delta region, which are: *transportation project, educational project, housing/residential accommodation projects, recreational projects and agricultural projects.* These public projects are funded by governments; decisions are implemented by the central government institutions and managed by government agencies in charge of the development of public projects. However, the execution of public projects sometimes maybe undertaken by private sector. Also, the study identified four (4) Key performance indicators as a tool that can be used in the management of public property development projects in the Niger Delta region, which are *Budget KPI, Quality KPI, Time KPI, and Resource management KPI*. These tools can be used to improve delivery, eliminate under and over cost estimate, eliminate lackadaisical attitudes, and reduce corruption in the development of public projects.

Recommendations

Based on the findings of this study, the following recommendations were made;

1. Government should start an initiative to increase awareness of new project management tools such as the use of key performance indicators as a tool in managing public projects.
2. Development authorities should be given more autonomy to plan and develop pubic projects and it should be free of control from the government and politicians.
3. There should be an enhance leadership capability of project managers by educating and training government staffs in the area of using these management tools.

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